

Contact: Rachel Boon

PROFESSIONAL DEVELOPMENT ASSIGNMENT REPORTS FOR FY 2020

Action Requested: Receive the professional development assignment reports submitted by the Regent universities for FY 2020.

Executive Summary: Each year, the Board of Regents is asked to approve faculty professional development assignments as specified in the Board Policy Manual 2.1.4.R. In November 2018, the Board approved 135 professional development assignments for FY 2020. For a variety of reasons, eight approved PDAs were cancelled and seven were deferred to a future term. Board Policy 2.1.R (a-e) directs the institutions to submit a yearly report of the completed professional development assignments. Pursuant to the 2011 Iowa Act, Chapter 122 (HF 45), “the board shall annually prepare a report comparing each assignment proposal to the results received.”

The estimated cost of the professional development assignment program was \$461,999 for FY 2020; however, during the award period faculty earned \$16.3 million in grants, with more than \$38.3 million in grant applications pending announcement of award status, and \$11 million more near submission. These assignments produced a return that is 35 times greater than the initial investment and could result in a return up to 140 times greater than the initial investment.

A brief description of each professional development assignment completed in FY 2020 is available in this report, including information about the value added to the students, university, and state from the assignments. This report addresses the Board of Regents Strategic Plan priority for “promoting and supporting innovation in teaching, research, and economic development” as well as “promoting effective use of resources to meet institutional missions.”

Iowa State University

BASAK, TATHAGATA, Associate Professor, Mathematics, 10 years of service, fall

Title: Automorphic Forms and Sporadic Groups

Professor Basak spent four months as a visiting researcher at the Indian Statistical Institute in Kolkata during his assignment, exploring mathematical challenges, developing new research collaborations, and setting the groundwork for future scholarly work. This work also resulted in the development of two scholarly papers and several invited talks.

BASU, SAMIK, Professor, Computer Science, 17 years of service, fall

Title: Modeling and Analysis of Complex Network Problems. Building Consensus and Controlling Epidemics: A Formal Methods Approach

Professor Basu worked with colleagues at Iowa State and Cornell universities to use data mining and analysis to help lawmakers and medical professionals develop healthcare policies that are both effective and budget-conscious. This work resulted in the submission of two funding proposals and three conference papers, and incorporating finding into Basu's computer science courses.

BECKETT, GULBAHAR, Professor, English, 6 years of service, 2019-2020 academic year

Title: Project-Based Learning: A Timely and Necessary Paradigm Shift for Second Language/Foreign Studies

Professor Beckett used her assignment to write portions of a book, *Project-Based Learning: A Timely and Necessary Paradigm Shift for Second Language/Foreign Studies*, which address the need for extended literature on the subject. Beckett also worked on revisions to another book, published an article, submitted proposals for three conference presentations, and submitted a \$238,000 funding proposal to the Institute for International Education.

BURKE, BRIANNA, Associate Professor, English/American Indian Studies, 9 years of service, spring

Title: Indian Summer: Growing up White in American Indian Cultures

Professor Burke completed or made substantial progress on several projects during her assignment, including a monograph bringing together her work in environmental justice, climate change, American Indian studies, and critical animality studies; a contribution to the *Encyclopedia of Contemporary American Fiction*; an abstract for the Modern Language Association; three additional articles and abstracts; and a residency application to the Foundation Jan Michalski in Switzerland.

CARAGEA, PETRUTA, Professor, Statistics, 17 years of service, fall

Title: Methods of Analysis for Large Spatio-Temporal National Labs Data Sets: A synergistic approach

Professor Caragea used her assignment to concentrate on methods of analysis for large spatio-temporal data sets, and to establish the infrastructure necessary to initiate collaborations with scientists from major national laboratories, including the NASA-Jet Propulsion Laboratory in California. Caragea also delivered two invited talks, prepared three manuscripts, and submitted a funding proposal to NASA.

CHANDRA, ABHIJIT, Professor, Mechanical Engineering, 21 years of service, spring

Title: Lithium Ion Battery Separator Design for Improved Thermal Stability

Professor Chandra completed an assignment focused on thermal instability in lithium-ion battery systems, which can lead to explosions and injury. Chandra's work with data-driven prognosis techniques led to the development of better design and manufacturing techniques for battery

separators; as well as a related journal publication and National Science Foundation funding proposal, both of which are in process.

CHUNG, TE-LIN, Associate Professor, Apparel, Events, and Hospitality Management, 9 years of service, spring

Title: Retail Analytics and Big Data in Research and Teaching in Apparel Design and Merchandising

Professor Chung spent her assignment studying how big data can be used to better understand consumer behavior, predict trends and demands, identify customers, and provide a more personalized and seamless retail experience. Outcomes from this work included two presentations, three manuscripts, and a \$41,000 grant proposal to the National Science Foundation.

CORDERY, STACY, Professor, History, 4 years of service, 2019-2020 academic year

Title: Elizabeth Arden and Her Beauty Empire: Changing the Face of America

Professor Cordery made substantial progress on her book, *Elizabeth Arden and her Beauty Empire: Changing the Face of America* during the assignment. Cordery also presented a paper for the First Ladies Colloquium, hosted by the White House Historical Association; served as a National Endowment for the Humanities Public Programs Grant reviewer; and wrote a book review for the *American Historical Review*.

CUNNALLY, JOHN, Professor, Art and Visual Culture, 31 years of service, 2019-2020 academic year

Title: Amici Huberti: Explorations in the Numismatic Networks of the Renaissance

Professor Cunnally conducted research, collected data, and explored 16th century numismatic collectors and collections for his book project on ancient Greek and Roman coins. This work also led to an accepted conference presentation to the Renaissance Society of America annual meeting in April (which was subsequently canceled, but will be presented in 2021), and has been incorporated into Cunnally's Iowa State art history courses.

DIMITROVA, DANIELA, Professor, Greenlee School of Journalism and Communication, 17 years of service, 2019-2020 academic year

Title: Terrorists, Migrants or Asylum Seekers? Understanding the Media Framing of Refugees

Professor Dimitrova visited Austria, Germany, and Turkey during her assignment to study the framing of news reporting and social media related to the Syrian refugee crisis. Results of this work included the preparation and submission of four manuscripts; four presentations at leading European universities; and progress on a textbook, *Global Journalism: Understanding Global Media Systems*. Dimitrova's assignment was funded through three competitive grants.

DOBSON, IAN, Professor, Electrical and Computer Engineering, 9 years of service, 2019-2020 academic year

Title: New Methods for a More Resilient Infrastructure: Strengthening the Electric Power Grid and other Vital Infrastructure Against Cascading Blackouts

Professor Dobson used the assignment to better explain patterns in the reliability of power grids. He also pursued numerous collaborations with colleagues at U.S. and international institutions, delivered five presentations at the IEEE Power and Energy Society Annual Meeting, published nine research papers, and earned \$57,000 in research funding from the Argonne National Laboratory and National Renewable Energy Laboratory.

FRANK, MATTHEW, Associate Professor, Industrial and Manufacturing Systems Engineering, 17 years of service, 2019-2020 academic year

Title: Advanced Manufacturing Research and Development in Industry

Professor Frank, an expert in advanced manufacturing, produced four major inventions during his assignment, in collaboration with Deere and Company, and between Deere and Oak Ridge National Laboratory. Three of the inventions were for hybrid manufacturing, and one was an improved N-95 respirator developed in support of Deere's COVID-19 response. Frank also developed enhanced face shield technology to affix face shields to worker safety caps, which was later adapted to Iowa State University football helmets.

GENSCHEL, ULRIKE, Associate Professor, Statistics, 11 years of service, 2019-2020 academic year

Title: Robust statistical methods for complex data structures

Professor Genschel's assignment focused on developing statistical methods for complex data structures. Outcomes of this work include the preparation and submission of eight manuscripts; the submission of two grant proposals to the National Science Foundation and Institute of Education Sciences, totaling \$1.16 million; and advancing research in statistical analyses of education data.

GENTILE, DOUGLAS, Professor, Psychology, 17 years of service, 2019-2020 academic year

Title: Digital Literacy Program and Positive Psychology

Professor Gentile created new digital literacy curricular materials for the Partnership for a Drug-Free Iowa, including modules on violent video games, and prosocial and creative video games. Gentile also hosted a state-wide conference for educators and administrators; and secured \$50,000 in funding to develop a pilot research project to examine children's use of screen media and educational and social outcomes, to be conducted in Iowa schools.

GORDON, MARK, Distinguished Professor, Chemistry, 28 years of service, fall

Title: Development of Innovative Methods for High Performance Computational Chemistry

Professor Gordon collaborated with leading developers of techniques and software in the U.S. and Australia to enhance the scientific community's ability to simulate heterogeneous catalysis on reasonable timescales – a grand challenge in the fields of chemistry and materials science. The results of his work led to a funding extension from the U.S. Department of Energy; travel funding for two graduate students; and the collection of data for several publications.

GREDER, KIMBERLY, Professor, Human Development and Family Studies, 20 years of service, 2019-2020 fiscal year (*originally scheduled for Jan-Dec 2019*)

Title: Cultural, Family, Community, and Policy Influences on the Health and Wellbeing of Mexican Families

Professor Greder focused her assignment in three areas: reducing education disparities, improving Latinx family health, and improving cultural understanding. These efforts resulted in 14 peer-reviewed manuscripts, 17 peer-reviewed presentations, one technical report, and three Iowa State University Extension and Outreach publications, including the *Salir Adelante* program to address educational disparities among Iowa's Latinx families.

HAAS, BARBARA LOUISE, Associate Professor, English, 34 years of service, fall

Title: When We Tell Ourselves Stories About Russia, These Are The Stories We Tell

Professor Haas used the assignment to complete seven nonfiction essays, three of which have already been published in national literary journals. Haas also visited Crimea to work on her nonfiction project, *When We Tell Ourselves Stories about Russia these are the Stories We Tell*, which highlights the human drama that pulses beneath the diplomacy of U.S.-Russia relations.

HASSID, JONATHAN, Associate Professor, Political Science, 5 years of service, fall

Title: The Everyday State: Measuring the Power of National Symbols

Professor Hassid published an academic article and completed more than 50% of a book abstract that examines the symbolic aspects of state power – how countries use apolitical speech like street signs, monuments, flags, heroes, sports teams, and even national time zones to build and expand their own legitimacy.

HILL, CHRISTINA GISH, Associate Professor, World Languages and Cultures, 11 years of service, spring

Title: Reuniting the Three Sisters: Indigenous Agricultural Revitalization in the Midwest

Professor Hill used her assignment to work on a book project focused on the importance of three sisters agriculture for Native peoples in the upper Midwest; the purposes and barriers to agricultural food security programs; and how Native people establish kin-based relationships with non-human entities in the landscape to construct their own cultural and political autonomy. Hill also submitted a National Endowment for the Humanities fellowship proposal, which is currently under review.

HOCHSTETLER, ANDREW LEE, Professor, Sociology, 21 years of service, fall

Title: Expanding knowledge of local community opioid interventions in successful locations

Professor Hochstetler examined emerging challenges faced by rural communities in the opioid crisis, including the development of tools to better predict at-risk areas. This work is supported by \$500,000 in USDA funding, with Iowa State as the lead institution (the University of Iowa is also a partner); and also by a \$725,000 National Institute of Justice grant that was funded during the assignment. Hochstetler also published three journal articles related to this work.

IVERSON, NEAL, Professor, Geological and Atmospheric Sciences, 23 years of service, 2019-2020 academic year

Title: Extending Scholarship and Grant Funding on Glacier Flow

Professor Iverson, an expert on glacial flow and landscape evolution, used his assignment to study how parts of fast-moving ice sheets move over their beds and deform along their sides. The results of this work included eight journal articles; five invited lectures in the U.S., United Kingdom, and New Zealand; and additional support for Iverson's graduate students.

KRIZAN, ZLATAN, Professor, Psychology, 13 years of service, spring

Title: Sleep and Interrogation: Optimizing Interrogator Alertness

Professor Krizan studied how sleep impacts interrogation professionals in the criminal justice system during his assignment, which resulted in grant proposals to the Russel Sage Foundation and U.S. Department of Defense; six papers and presentations; and additional collaborations with the U.S. Army to predict resilience to sleep loss.

LEE, DUCK-CHUL, Associate Professor, Kinesiology, 8 years of service, fall

Title: Physical Activity and Cardiovascular Disease Prevention

Professor Lee examined what type or combination of exercises is most effective in preventing cardiovascular disease, the nation's leading cause of death, during his assignment. This work resulted in new content for Lee's Iowa State courses; three published journal articles, and an additional three articles in preparation or under review; and submission of a \$1.54 million grant application that is currently under review.

LUCHT, TRACY, Associate Professor, Greenlee School of Journalism and Communication, 8 years of service, fall

Title: Amelia Bloomer and the Origins of Feminist Journalism

Professor Lucht used her assignment to complete a biographical study of Iowan Amelia Bloomer, founder of The Lily – the first U.S. newspaper published specifically for women – and later president of the Iowa Woman Suffrage Society. Results included substantial progress on a book project, journal article, and conference presentation.

LUTZ, JACK, Professor, Computer Science, 33 years of service, spring

Title: Molecular Programming and Theoretical Computer Science

Professor Lutz collaborated with scientists at the California Institute of Technology to study chemical reaction networks, algorithmic fractal dimensions, and developing new research in quantum information theory. Results of this work included five published papers, six papers submitted and under review, and invited lecture, and \$800,000 in research funding from the National Science Foundation (*also with Robin Lutz, below*).

LUTZ, ROBYN, Professor, Computer Science, 20 years of service, spring

Title: Software Engineering for Safety in Programmed Molecular Nanosystems

Professor Lutz's assignment extended her research into the growing field of programmed molecular nanosystems. These systems have a variety of applications, including medical sensors that can be absorbed by the body, drug capsules that open only when they find diseased cells, and programmable nanoscale robots. Outcomes of the assignment included three publications, and invited presentation, and \$800,000 in research funding from the National Science Foundation (*also with Jack Lutz, above*).

MACKIEWICZ, JO MARIE, Professor, English, 6 years of service, fall

Title: Welding Communication

Professor Mackiewicz used her assignment to complete the first draft of *Welding Technical Communication*, which explores how welding students develop embodied knowledge through one-on-one welding interactions and classroom time, and subsequently become members of a professional community of practice. Mackiewicz also wrote three journal articles, completed the index for her edited collection on *Theories and Methods of Writing Center Studies: A Practical Guide*. The research will contribute to Iowa State's technical communications courses, extension and outreach to the agricultural community, and education in Iowa community colleges.

MARTENS, BOBBY, Associate Professor, Supply Chain Management, 14 years of service, fall

Title: Truckload Transportation Utilization, Hours of Service, and Shipper Relationships

The major outcome of Professor Martens assignment was to position himself and Iowa State as contributors to the new MIT Driver Initiative, which is focused on the shortage of drivers, and electronic logs that limit drivers' hours of service. Martens' work led to models predicting driver turnover, three white papers and a journal publication.

MARTIN, RYAN, Professor, Mathematics, 10 years of service, 2019-2020 academic year

Title: Extremal Poset and Graph Theory

Professor Martin's assignment extended his research in two areas – extremal theory of partially ordered sets, and extremal theory of graphs, which resulted in the submission of five journal articles. Martin received a Fulbright Fellowship to support his research collaborations in Hungary, as well as a travel grant for his work in Germany, and a \$42,000 award from the Simons Foundation.

MUENCH, JOSEPH, Professor, Art and Visual Culture, 19 years of service, spring

Title: Of Humans, Places and Artifacts

Professor Muench used his assignment to research devices inspired by themes of nature, human activity, and artifacts found on ancestral farm sites located near Ames; learn new processes for

steam bending, which resulted in the creation of a series of COVID-19-inspired steel face coverings; and preparing for instruction in the summer 2020 and fall 2020 terms.

NGUYEN, XUAN HIEN, Associate Professor, Mathematics, 9 years of service, spring

Title: Asymptotic Behavior of Partial Differential Equations

Professor Nguyen completed research on the theoretical and computational challenges of partial differential equations during her assignment, including their application to more general settings. This work resulted in the submission of two journal articles, and a research collaboration with colleagues at the University of Wisconsin, Madison.

NIEMI, JARAD, Associate Professor, Statistics, 9 years of service, 2019-2020 academic year

Title: Development of computer model emulators for agricultural applications

Professor Niemi used his assignment to develop more realistic statistical emulators for the agricultural industry, including such topics as the soil-vegetation-atmosphere system, sediment runoff, and biogas production, that model the input-output of current computer models and run in a fraction of the time. Additional results of this work included two submitted manuscripts with graduate student advisees.

OAKES, GREGORY WAYNE, Professor, Music and Theatre, 12 years of service, spring

Title: Designing and Building a Microtonal Clarinet

Professor Oakes used his assignment to construct a microtonal clarinet, an instrument custom-modified to play microtones (notes that fall between the pitches on a piano keyboard), and to work with composers writing music for the new instrument. Oakes also published a journal article on the microtonal clarinet; performances to introduce the instrument to the musical community were postponed due to COVID-19.

ONG, SAY KEE, Professor, Civil, Construction, and Environmental Engineering, 26 years of service, spring

Title: Understanding microbial community dynamics on uptake of nutrient in wastewater systems

Professor Ong's assignment focused on removal of nitrogen and phosphorus from wastewaters, a key component of the Iowa Nutrient Reduction Strategy, to minimize the impact on Iowa waterways. The results of this work included a trip to work with collaborators in Switzerland; submitting two journal manuscripts; and submitting four funding proposals, two of which received a total of \$20,000 in funding.

PETERSON, DAVID ANTHONY MUENCH, Professor, Political Science, 11 years of service, fall 2019 (originally scheduled for 2019-2020 academic year)

Title: Microtargeting campaign advertising on YouTube

Professor Peterson used the assignment to test how campaign strategies are able to reach voters, in support of his National Science Foundation-funded project, resulting in the preparation of three manuscripts. Peterson also spent portions of his assignment coordinating Iowa State's polling for the 2020 Iowa Caucuses, which will be featured in an upcoming book.

RINEY-KEHRBERG, PAMELA, Distinguished Professor, History, 20 years of service, 2019-2020 academic year

Title: When a Dream Dies: Agriculture, Identity, and the Farm Crisis of the 1980s

Professor Riney-Kehrberg served as a traveling historian during her assignment, supported by a National Endowment for the Humanities grant administered by the State Library. She also completed research on a project, *When a Dream Dies: Agriculture, Identity, and the Farm Crisis of the 1980s*, which will be the first book-length history of Iowa in the farm crisis.

SEEGER, CHRISTOPHER, Professor, Landscape Architecture, 17 years of service, Nov 2019 – Apr 2020 (originally scheduled for Jan – Jun 2020)

Title: Investigating methods to provide Visual and Spatial Data Science training through interactive Cooperative Extension educational opportunities

Professor Seeger's assignment considerably expanded his expertise in geospatial and web mapping technologies, and data visualization, which will be incorporated into for-credit and non-credit classes, workshops, and Iowa State University Extension and Outreach programming. Seeger's work during the assignment also resulted in two awards from the National Association community Development Extension Professionals, and three funding awards totaling \$220,000.

SMITH, EMILY, Professor, Chemistry, 14 years of service, 2019-2020 academic year

Title: Technology Development for Future Intellectual Property, Training and Funding Opportunities in Analytical Chemistry

Professor Smith served as an American Association for the Advancement of Science, Science and Technology Policy Fellow, during her assignment, working at the U.S. Department of Energy's Basic Energy Sciences (BES) office. In this role, Smith provided input on the development of BES' strategic plan, as well as DOE Office of Science Diversity, Equity, and Inclusion policy roadmap, and helped to develop a new strategic plan for machine learning (artificial intelligence) research within the BES portfolio. While on leave, Smith co-authored over 15 research manuscripts, and received a \$500,000 National Science Foundation grant.

SONG, JIMING, Professor, Electrical and Computer Engineering, 18 years of service, 2019-2020 academic year

Title: Collaborate with universities in China and Singapore in research on metamaterials

Professor Song traveled to China to expand his research in metamaterials, and to establish new international collaborations, during his assignment. The results of his work included a plenary talk, short course, and invited presentations in China; an invited faculty fellowship at the University of Texas at Austin; five publications; \$5,000 in external funding; and new material for his Iowa State engineering courses.

VIATORI, MAXIMILIAN, Associate Professor, World Languages and Cultures, 15 years of service, fall

Title: Unmoored: Class, Inequality, and Life in the Eastern Pacific

Professor Viatori completed the draft of a book manuscript that examines how resource extraction, development and pollution have transformed the relationship between human and non-human species. Viatori also published a journal article, submitted two conference proposals, established research collaborations with colleagues in Peru, and is developing a grant proposal based on his work.

WANG, XINWEI, Professor, Mechanical Engineering, 12 years of service, spring

Title: Career Development via International Collaboration and New Research Initiation in Near-field Thermal Radiation and Energy Storage Thermal Design

With proposed travel to China canceled due to COVID-19, Professor Wang used his assignment to focus on developing successful grant proposals and working with graduate students on assignments related to micro/nanoscale thermal science. This work resulted in seven journal articles, and two federal research grants (NSF and DOE) totaling \$663,000.

WITHERS, JEREMY RICHARD, Assistant Professor, English, 5 years of service, fall

Title: Futuristic Cars and Space Bicycles: Contesting the Road in American Science Fiction

Professor Withers completed and published *Futuristic Cars and Space Bicycles*, the first book to examine the history of representations of road transport machines in American science fiction

from the late 19th to early 21st centuries. Withers also drafted and submitted a journal article on mobility in literature, and incorporated his research into Iowa State's science fiction classes.

WOHL, SHARON, Assistant Professor, Architecture, 6 years of service, fall

Title: Engaging Complexity Research in the Netherlands

Professor Wohl completed substantial portions of a website that will assist students, professionals, and laypeople in understanding complex adaptive systems theory. Wohl also visited the Netherlands, where she delivered one module of a PhD seminar and gave two guest presentations, raising Iowa State's profile in this emerging area of study.

WOHLSDORF-ARENDT, SUSAN, Professor, Apparel, Events, and Hospitality Management, 16 years of service, fall

Title: Advancing Foodservice Management Education

Professor Arendt used her assignment to develop content for a foodservice management case study book and instructor manual, both of which will be available online at no cost for students and colleagues. Arendt also developed course materials for her courses in foodservice systems management, mentored graduate students, published a journal article, and delivered a webinar for food handlers.

University of Northern Iowa

ALSTATT, ALISON, Associate Professor, Music, 8 Years of Service, Fall

Title: Wilton Abbey in Procession: Religious Women's Music and Ritual in the Thirteenth-century Wilton Processional

Dr. Alstatt's project centered on the Wilton Processional, a medieval musical manuscript from the Benedictine convent of Wilton Abbey, which educated English women for over 600 years. This manuscript, containing music for processional rituals, was known only from a 19th-century copy until the researcher's identification of 38 of its original leaves, including one at the University of Iowa. Originally awarded for a full academic year, the PDA was shortened to Fall 2019 due to financial constraints. The work resulted in the completion of and submission of a book proposal which was accepted by University of Liverpool Press for the series: *Exeter Studies in Medieval Europe*. Dr. Alstatt progressed in drafting several of the book's chapters. She also created a searchable digital inventory of the manuscript by creating a complete transcript coded with searchable metadata. The inventory has been entered into the Cantus Database, has been proofed, and is currently undergoing editorial review. Dr. Alstatt's work is of value to the University of Northern Iowa as it informs both her teaching and future research endeavors. Dr. Alstatt's research further allowed her to successfully obtain a prestigious National Endowment for the Humanities stipend for Summer 2020, raising the research profile of the University. Her research on women's religious history and music benefits the citizens of Iowa through the insights it brings to her teaching of future Iowa classroom music teachers. Dr. Alstatt's research also impacts the broader Iowa community, by resulting in new descriptions of manuscript items held in the Permanent Art Collection and the University of Iowa Special Collections.

BROWN, SETH, Professor, Psychology, 17 Years of Service, Spring

Title: How Associative Stigma towards Depression Impacts Family Members

Dr. Brown's research focused on the stigma towards family members of individuals with mental illness (associative stigma) with a more commonly occurring disorder – depression. Dr. Brown formulated and submitted two manuscripts to peer reviewed journals (based on a previously collected dataset collected). This research yielded novel and important findings on associative

stigma. A conference presentation and one manuscript documented that a subset of family members reported elevated associative stigma. For these individuals, they also reported greater levels of distress, worse attitudes towards treatment, and elevated public stigma (towards others with depression). Consistent with previous research, the second manuscript documented greater public stigma towards an individual with a mental illness (depression) compared to individuals with a physical condition (asthma). However, in regard to associative stigma, Dr. Brown found that lower public stigma was noted toward the family member than the individual (for both depression and asthma). These findings substantiate that family members experience adverse personal and interpersonal consequences, but the general public doesn't endorse such strong stigma towards family members. Dr. Brown's research brings recognition to UNI, facilitates collaborations with other researchers, may attract undergraduate and graduate students to UNI, and provides UNI students with unique research and clinical opportunities. The citizens of Iowa also benefit from this research through interventions developed later to address associative stigma. The dissemination of Dr. Brown's research material through his teaching can inform students who go on to work in the mental health field, as well as the general population (both in and outside Iowa) on associative stigma and may lead to alterations in their behaviors. Lastly, these findings have implications for how to best allocate community and family mental health intervention resources.

GUTE, GARY, G., Associate Professor, Applied Human Sciences, 18 Years of Service, Fall

Title: Built to Flow: Ourselves, Our Families, Our Schools, Our Work

Dr. Gute's project focused on applying the psychological concept of flow to the Cedar Rapids' renaissance following the epic flood of 2008 that devastated 10-square miles of the city. He focused particularly on the period of economic, educational, and cultural innovation that arose as a response to the disaster. Dr. Gute completed and submitted a 32-page book proposal and three sample chapters to literary agents and publishers. Three of the chapters have been completed and polished. Dr. Gute has also completed detailed outlines for the remaining book chapters: *The Science and Design of Flow*; *The Flow of Relationships*; *The Flow of Learning*; *The Flow of Work*; *The Flow of Character*; and *Flow into the Future*. This work is of value to the UNI community, as it informs Dr. Gute's teaching, which in turn impacts student learning. Additionally, Dr. Gute's book is the official follow-up to Mihaly Csikszentmihalyi's 1990 bestseller *Flow: The Psychology of Optimal Experience*. As Csikszentmihalyi is one of the co-authors of this book, it is a reasonable expectation that *Built for Flow* will sell well in both U.S. and international markets. UNI and the state of Iowa can therefore expect to receive significant global recognition when this book is published. The city of Cedar Rapids and the state of Iowa will also benefit by having a published account detailing the epic 2008 flood, its impact on a major metropolitan area, and the changes that occurred as a result of that natural disaster.

HESELINK, REINIER, Professor, History, 24 Years of Service, Spring

Title: The Suicide of Takenaka Uneme Book Project

For his project, Dr. Hesselink wrote a first draft of his new book, *The Suicide of Takenaka Uneme: Christianity and the Samurai in 17th Century Japan*, which discusses the impact of Christianity on the samurai class of Japan in the late 16th and early 17th centuries. Dr. Hesselink's draft manuscript is currently being scrutinized by a professional for the order of its composition and the details of its English style. Dr. Hesselink's research will inform his teaching, which in turn improves student learning of Japanese culture. Additionally, Dr. Hesselink's book will benefit UNI by giving the university exposure throughout the United States, Europe, and Asia. It will benefit the state and the citizens of Iowa through its engagement with the history of one of our state's most important international trading partners: for the past half century Japan has bought a major portion of our yearly crops of soybeans and corn. Additionally, the religious theme of Dr. Hesselink's book has universal implications.

HETTLE, WALLACE, Professor, History, 25 Years of Service, Fall

Title: The Union Homefront: A History in Documents

Dr. Hettle's project involved searching, collecting, and choosing for publication roughly one hundred historical documents for his new book, *The Union Home Front: A Brief History through Documents*. The book serves as a companion to one of his earlier books, *The Confederate Home Front: A Brief History through Documents* (2017). Dr. Hettle's research involved historical documents from a variety of sources, including newspapers, diaries, advertisements, Congressional hearings, letters to Abraham Lincoln, military orders, and narratives of white women captured by Indians. Students will benefit from Dr. Hettle's book, as they will gain a better understanding of Civil War history, and engage critical thinking and writing skills as they analyze these primary source documents in the classroom. In addition, the work will benefit Iowans and other Midwesterners as the book contains a distinctive emphasis on Midwestern and Iowa components of the Civil War story, including the Homestead Act, the transcontinental railroad, and the philanthropy of Keokuk's Annie Turner Wittenmeyer. Additionally, the content speaks to our national fascination with the Civil War and provides students and general readers a chance to shape their own understanding of Civil War history. With recent discussion in the news focused on race, the project has become even more relevant today.

KIDD, TIMOTHY, E., Professor, Physics, 14 Years of Service, Spring

Title: Microscopic Origin of Electronic Growth Modes in Metal Dichalcogenide Systems

Dr. Kidd's original proposal was greatly impacted by Covid-19. Many experiments were eliminated and the research focus shifted, such that Dr. Kidd developed a more remote collaboration with a local company to work on nanomaterial additives of lubrication. This collaboration led to a successful partnership with Argonne National Laboratory at the Center for Nano Materials, an ongoing Research and Development project, and an NSF-SBIR grant submitted at the beginning of September. Dr. Kidd continued to research nanocellulose, shifting from ultra-low density aerogels into potential 3D printing of high density cellulose composite materials, and the partnership has built a novel nanocellulose 3D printer and succeeded in initial printing. Department of Energy funded work in nanostructured metal films has also continued, with successful applications for research time at both Argonne and Brookhaven national Laboratories. Dr. Kidd's collaboration to measure nanoscale aspects of DNA structure yielded a publication this fall and also resulted in developing an NSF RUI grant to expand this work to include microbiologists from the University of Iowa. Dr. Kidd was also able to develop and submit a manuscript that is currently under review by *Science*, and a provisional patent filed on September 16, 2020. Dr. Kidd's modified plan was instrumental in the creation of an interdisciplinary team to develop interactive fiction based educational games for teaching university level concepts in STEM and information literacy. His team is now funded by NASA ISGC and is supporting two students to perform a pilot study. Finally, the faculty member was able to complete a K12 curriculum in robotics which is now in use by a former student teaching in Minnesota.

KOGL, ALEXANDRA, M., Associate Professor, Political Science, 16 Years of Service, Spring

Title: Easier Than Saying No: Women, Domination and Submission

Dr. Kogl worked on a book aimed at developing a theory for understanding the power dynamics involved in gray-area forms of sexual mistreatment. Dr. Kogl currently has one chapter under review for publication. In this chapter, Dr. Kogl argues that the gray area of some sexual assaults may be understood as a kind of domination, and that such domination relies on the responsiveness of the victim. A second chapter explored the ways in which women exercise agency within relations of domination, challenging the tendency to treat women as either agents or victims. The results of Dr. Kogl's research implies that consent by itself is not adequate to define an experience as ethically acceptable, while also highlighting the ways in which

heterosexual women exercise agency, and therefore responsibility, within dynamics of domination. On the one hand, women benefit from understanding the barriers to their own effective self-assertion. On the other hand, men benefit from understanding that unwilling consent (e.g. a woman saying yes because she feels she has no real choice) is likely to be perceived by many women as assault. Dr. Kogl's research benefits UNI as students will be better informed about how power dynamics influence perceptions of sexual assault. Additionally, this research has the potential to impact policymakers who write policies related to sexual assault for UNI's campus and the state of Iowa generally.

MONTGOMERY, SARAH, Associate Professor, Curriculum and Instruction, 11 Years of Service, Fall

Title: Cultivating Well-Being Through Mindfulness in Higher Education

Dr. Montgomery's project involved analyzing data she collected from a weekly mindfulness group with UNI students throughout the 2018-2019 academic year. She focused on how student engagement in mindfulness strategies that promoted present moment awareness supported student well-being. analysis indicated that students used the strategies to improve focus in class, strengthen study skills, self-regulate their emotions, improve their social connections, and build overall resilience. Based on these findings, Dr. Montgomery wrote three chapters and drafted two additional chapters for a book she is writing titled, *Building Resilience: Empowering Students through Mindfulness in Higher Education*. This work resulted in the submission of a book proposal in July 2020. Dr. Montgomery's project is of value as it positively impacted the well-being and retention of UNI students who participated in the mindfulness group. Many students who participated in the group were Resident Assistants or campus leaders. What they learned by participating in this research project may have positively impacted their interactions with others students, staff, and faculty on campus. Dr. Montgomery's students also benefitted from this project, as she developed and taught an Honor's Seminar in Spring 2020 titled, "The Science & Practice of Well-Being: Mindfulness, Compassion, & Joy," for which she won the UNI Honors Program Outstanding Faculty Award. Several members of the student mindfulness group were education majors and shared that they plan to teach the well-being strategies in their future classrooms in Iowa. The research for this project has additionally propelled her to play a key role in guiding the development of a new social and emotional learning (SEL) certificate for education majors at UNI. Students who pursue this certificate will become well-being leaders in their future school communities in Iowa.

POLEKSIC, ALEKSANDER, Professor, Computer Science, 14 Years of Service, Fall

Title: An Informatics Platform for Predicting Side-Effects Associated with Multi-Drug Therapies- Research and Commercialization

Dr. Poleksic's project was designed to address the inability of clinical trials to accurately and reliably detect adverse drug reactions resulting from interactions of two or more drugs. Building upon the existing in-house methods, Dr. Poelksic and his colleagues developed the statistical procedure called the "Cascading Likelihood Ratio Test" to extract and normalize the population and treatment specific frequencies of observed therapy-ADR associations stored in FDA's FAERS database (<https://open.fda.gov/data/faers>). Dr. Poelksic and his team then applied a unique matrix factorization routine to predict: (1) new therapy-ADR associations and (2) ADRs associated with therapies consisting of new chemicals. The results of Dr. Poelksic's study were published or submitted for publishing in reputable venues, such as *Nature Scientific Reports* and *IEEE Transactions on Computational Biology and Bioinformatics*. Dr. Poelksic and his colleagues developed an improved method for biomedical relationship prediction that can be applied to solve the problem around which he developed his PDA project (e.g., of the inability of clinical trials to accurately and reliably detect adverse drug reactions). Dr. Poelksic's team is working with UNI's intellectual property office to file a provisional patent application. One of Dr. Poelksic and team's

long-term goals is to commercialize these and other algorithms for biomedical relationship inference. Some of those algorithms, including Dr. Poelksic's method for therapy-ADR association prediction, have been deployed as a Web server at UNI. The server can be accessed at bioinfo.cs.uni.edu. Dr. Poelksic's project will advance biomedical research at UNI and provide a rich set of topics for undergraduate and graduate research projects. Successful commercialization of our technology will help establish UNI-industry partnerships.

PRAMANIK, NILMANI, Professor, Technology, 16 Years of Service, Fall

Title: An Integrated Approach for Sustainable Manufacturing using Deviation-based Cost Formulations for Reducing Cost of Manufacturing and Optimizing Part Geometric Features

Dr. Pramanik's research focused on establishing deviation-based cost formulations for reducing cost of manufacturing and optimizing part geometric features for sustainable manufacturing operations. The goal of Dr. Pramanik's project was to develop an application-programming interface (API) that would be relevant specifically for the small- and medium-sized enterprises (SMEs) in manufacturing sector. Manufacturers need to produce at a minimum cost without compromising quality and at the same time maintain tight delivery schedule. In order to achieve these requirements, realistic modeling of cost of manufacturing is essential for estimating cost of a part/product. In Dr. Pramanik's project, the deviation-based cost formulations have been integrated for feature optimization through an API that connects the part CAD model with the cost functions. Dr. Pramanik's project integrated two essential components of sustainable manufacturing a) minimizing the cost of production and b) optimizing part features to reduce material usage. The API has been used in a case study on a small part to optimize the geometric features to reduce material cost. Dr. Pramanik's research benefits not only the UNI community, but also the state of Iowa and elsewhere. A potential application of this research would be to formulate projects engaging UNI graduate students in the manufacturing engineering technology areas to carry out further case studies to establish the effectiveness of these methods on various type of parts. It is also contemplated that some of the cost-tolerance concepts could be introduced in UNI courses.

ROSBURG, ALICIA, Associate Professor, Economics, 14 Years of Service, Fall

Title: Sustainable Brewing: Perceptions and Practices

For her project, Dr. Rosburg's used an in-depth survey of Iowa brewers to provide insight on practices and perceptions related to sustainable brewing. The project assessed current brewery practices, brewery networking and information sources, and brewer perceptions about consumer preferences and willingness-to-pay for sustainably produced beer. These factors were analyzed in conjunction with data on brewery production characteristics and the brewer's personal beliefs and demographics. The project results revealed several interesting relationships that can be utilized by those working to increase sustainability initiatives within breweries; it also provided evidence for further support and investigation into specific sustainable brewing components. The survey procedures, analysis, and results were used within the curriculum of the Economics of Sustainability and Introduction to Sustainability courses in Spring 2020 and are also being used in the Environmental Economics course in Fall 2020. The results from the analysis provided the Iowa Green Brewery Certification (IGBC) program, operated out of UNI's Iowa Waste Reduction Center (IWRC), with insights and improved understanding of the tradeoffs faced by Iowa brewers regarding sustainable brewing. Through the IGBC's work, these benefits extended state-wide. Further, many of the tradeoffs identified from the project analysis are not unique to brewers. As a result, the results of Dr. Rosburg's research provided the IWRC with improved understanding of tradeoffs faced by Iowa small business owners, in general, when making sustainability decisions.

WONDERS, BROOKE, J., Assistant Professor, Languages and Literatures, 6 Years of Service, Fall and Spring

Title: Purchase, Murder, Theft: A Story Collection

Dr. Wonders focused on updating all her courses with new readings, developing her own creative work, and presenting at a conference. Dr. Wonders read over 75 titles, comprising a mix of nonfiction, novels, short story collections, and writing craft texts, across the various fields in which she teaches. Much of the work she read was written by people in her professional network: writers met through workshops, conferences and the Internet. This, along with the fact that her essay, "Self-Erasure," was selected for inclusion in a major new creative nonfiction textbook out from Bloomsbury raises Dr. Wonders' national profile considerably. Her short play, "Unbirthday," was chosen for a revival production as part of Theatrikos Theater Company's experimental Zoom series; this play is now live on Youtube and available to all. Wonders also drafted a new critical article, "The Datlow Horror Project," which she plans to present, alongside as many students as possible, to the 2020 International Conference for the Fantastic in the Arts (in 2019, 11 of her students had papers accepted, and eight attended the conference in Orlando). The conference will be held online this year due to COVID, which will enable many more students to attend. Dr. Wonders' also invited her students to read for the Vonnegut Prize in speculative fiction, judged by award-winning author Kij Johnson. UNI undergraduates presenting at an international conference and working with a prize-winning author raises the university's profile in the field, making UNI an internationally renowned site for the study of speculative literature.

University of Iowa

ARNDT, MATTHEW, Associate Professor, Music, 9 years of service, fall

Title: Elaboration in Georgian Chant

Professor Arndt studied the elaboration of simple musical patterns to produce complex ones in three-voiced sacred chant from the Republic of Georgia. Professor Arndt aimed to investigate the unity of an ancient, simple manner of Georgian chant with two increasingly modern, elaborate manners. He extrapolated forms of elaboration, synthesizing 1) empirical data about melodic and harmonic tendencies in transcriptions of the three manners of chant, 2) interpretation of a manuscript containing the sole extant explanation by one of the original master chanters of relations between the three manners of chant, 3) experiential learning of style through attending a Georgian singing workshop with master musicians. He is working on a paper to be presented at up to three international conferences this year and eventually published as an article. This research sheds new theoretical and practical light on the treasury of Georgian chant, and it contributes to his teaching and research on elaboration in Western music.

BEICHEL, REINHARD R, Associate Professor, Electrical-Computer Engineer, 14 years of service, fall

Title: Investigating deep learning methods for automated medical image analysis

Professor Beichel has studied various advanced machine learning methods. Specifically, the focus was on researching deep convolutional neural networks in the context of automated analysis of medical images. The resulting insights have contributed to student education and will be helpful for developing new courses focused on machine learning and its application. The research has resulted in preliminary work that was used to write a NIH grant application with the goal of enabling precision medicine to improve the treatment of lymphoma patients. Furthermore, a journal paper about the use of convolutional neural networks for medical image segmentation was published. In addition, two new interdisciplinary research collaborations with researchers at the University of Iowa were established, and work on gaining extramural funding has been started.

BELLI, MERIAM N, Associate Professor, History, 12 years of service, fall

Title: Manuscript Writing and Editing: Death in Transit

Professor Belli worked on her book “Death in Transit,” which proposal is under review by Stanford University Press. Professor Belli fully redesigned the structure of her project; sorted out her numerous archival finds (France, Israel, Tunisia, Egypt); and started the transcription of her interviews. She also co-wrote a roundtable proposal on death studies for the Middle East Studies Association (MESA, which was accepted) and will be presenting a paper at the MESA on theory and methodology. The manuscript explores how funerary practices and narratives are means through which we articulate, in the present, sociocultural boundaries, difference, and appurtenance. They root concepts of selfhood and collectivity. They anchor discrete understandings of change. As such then, mortuary and funerary performances and narratives are often sites of both affirmation and contestation. In the 1880s as in our days, lethal crises such as pandemics do not immediately and inevitably bring about change. However, they often have for effect to alter scientific theories, social practices, beliefs, and political designs. How we dispose of the dead shapes the space of the living.

BOND, SARAH E, Associate Professor, History, 6 years of service, fall

Title: Providing Digital Humanities Resources and Workshops for Public Outreach

Professor Bond focused on increasing outreach, engagement, and training in public scholarship in Ancient History and Classics. She achieved this through crafting materials for a workshop held at Northwestern University in October of 2019 that will now serve as a model for training graduate students and early career scholars in public writing. She also worked closely with the Graduate College to encourage the inclusion of outreach, digital humanities publications and accessible writing into the evaluation of graduate education as well as tenure and promotion standards for faculty. She completed two chapters of her second monograph, published a book review, and completed a first draft for a journal article that was presented at a conference at UW-Madison. She continued collaborative outreach as editor-in-chief of the weekly blog for the Society for Classical Studies and as a contributor to the arts journal *Hyperallergic*. She helped organize two international conferences. She received the Women's Classical Caucus' yearly Public Scholarship Award in recognition of her work to make the field more welcoming to the public.

BROWN, MATTHEW P, Associate Professor, English, 19 years of service, spring

Title: The Novel and the Blank: Thinking with the Print Shop in British America

From his book in progress, Professor Brown composed the two chapters. “The Chapman’s Pamphlet” (Chapter Three) uses records from the book trades to rethink what scholars call the “literature of revolution”: that is, the pamphlets on national independence. He argues that chapbooks bear the same political heft as the debates of legal elites. He substantiates the claim through study of sales tactics, booklists and close analysis of a devotional chapbook and a folktale pamphlet. “Bell’s Liberties” (Chapter Four) examines the circulation and reprinting of popular English novels by Henry Mackenzie and Laurence Sterne. Brown also completed three articles. He co-authored one on pedagogy with UI graduate students, a process with immediate rewards for his teaching plans. Professor Brown revised courses on Poe and Franklin to include writers of color. He was the Principal Investigator for a CARES Act grant, selected as the only one from the UI to go to the NEH. His PDA helped sustain and refresh our cultural heritage, one necessary project of the humanities.

BUCH, ELANA D, Associate Professor, Anthropology, 9 years of service, fall

Title: Transforming Care on the American Prairie.

Professor Buch’s research examines the intersections of aging, inequality, kinship, and care. During the PDA, Professor Buch advanced new research investigating how people, families, and communities in rural Iowa are adapting their ways of caring for one another and local landscapes in the face of rural aging and out-migration. Professor Buch conducted an extensive literature review on rural aging, rural-urban migration and elder care in the Midwestern U.S. The review

forms an essential portion of applications to fund future ethnographic research. This research will inform courses on the Anthropology of Aging, Caregiving and Health, and the Beginnings and Ends of Life. Professor Buch also developed research collaborations with faculty across the region which led to three new publications which advance theories of care, develop new practices of ethical consent with older adults and analyze misconceptions about aging in the global South. This research advances the University of Iowa's strategic goal of enhancing engagement with Iowa communities, and provides evidence to inform policymaking to support rural older adults.

CARREL, MARGARET, Associate Professor, Geographical and Sustainability Sciences, 9 years of service, spring

Title: Spatiotemporal Patterns and Processes of Infectious Disease Outcomes in US Veterans, 2004-Present

Professor Carrel's PDA was used to work on her Carnegie Fellowship that explores changes in infectious disease outcomes after Veterans experience residential flooding due to hurricanes and other natural disasters. She collaborated with data analysts and infectious disease researchers at the Iowa City VA hospital and the University of Iowa Hospitals & Clinics to generate a cohort of Veterans residing in Texas counties that were exposed to Hurricane Harvey. Working with her graduate student and fellow geographers, Professor Carrel has determined which Veterans experienced residential flooding due to Hurricane Harvey and is conducting statistical analysis to determine if and how their infectious disease outcomes changed in the weeks following exposure to floodwaters. This work is also being expanded to look at flooding in North Carolina following Hurricane Matthew. Professor Carrel is also conducting novel remote sensing analysis and machine learning to detect the locations of industrial livestock operations in hurricane impacted southern states in order to further explore whether residential proximity to flooded livestock operations increases the risk of drug resistant infections.

CARRICA, PABLO, Professor, Mechanical Engineering, 13 years of service, fall

Title: Improving bubbly flow modeling and simulation capabilities for naval applications

Professor Carrica focused on improving modeling and simulation capabilities for bubbly flows of naval interest. He spent one week at Stanford University working with a group studying a direct numerical simulation (DNS) solution of an air/water hydraulic jump. He familiarized with the solutions, prepared datasets to bring to Iowa, and back in Iowa worked with his PhD student, Ben Yuan, extracting statistical data to use for bubble entrainment models. Considerable progress was made on this topic and work continues. Work was also devoted to model bubble breakup and coalescence to improve the ability of the numerical tools used by Professor Carrica's research group to predict bubble size distributions in flows of naval interest. Professor Carrica also wrote two proposals for the Office of Naval Research (ONR), one of them funded and the second pending. A paper on vortex visualization was completed, submitted and published. Two more papers, one on an expired grant and another with partial funding, were also completed and submitted. Two papers related to research from this PDA are in preparation.

CHIFAN, IONUT, Associate Professor, Mathematics, 8 years of service, fall

Title: Prospectus for a Project on the Structure of Group von Neumann Algebras

Professor Chifan dedicated a large portion of his PDA to the study of rigidity aspects for von Neumann algebras $L(G)$ arising from countable groups G . Briefly, rigidity results in this area refer to the situations when structural aspects of algebra $L(G)$ are uniquely determined by the underlying group G ---the canonical information from which it was constructed. Obtaining results of this type is extremely difficult and despite sustained research efforts from many mathematicians, spanning decades, only a handful of positive results are known to this date. During his PDA, together with collaborators, graduate students and postdocs Professor Chifan was able to find new techniques that enabled them to make new advancements in this research

area by finding numerous new examples of groups G that can be reconstructed from $L(G)$. In doing so they also managed to advance several other long-standing conjectures due to Alain Connes and Vaughan Jones (Fields medalists) and establish new interesting bridges with various area of mathematics, notably C^* -algebra theory and geometric group theory.

CHIPARA, OCTAV, Associate Professor, Computer Science, 9 years of service, spring

Title: Software Adaptation Techniques for Internet-of-Things (IoT) Systems

Professor Chipara has focused on future Industrial Internet-of-Things (IIoT) systems which require wireless solutions to connect sensors, actuators, and controllers as part of high data rate feedback-control loops over real-time flows. A key challenge in such networks is to provide predictable performance and adaptability in response to variations in link quality. Professor Chipara has developed new methods to program network systems that meet these constraints. These efforts have led to a published conference paper, a journal publication that is under submission and another paper in preparation. He has also put together a proposal for Research Experiences for Undergraduates from the National Science Foundation. The program will inspire students to pursue careers in computer science and related fields through early exposure to high-quality and hands-on research experiences as part of diverse, engaging and cutting-edge projects. He expects to attract undergraduates who are underrepresented in computer science. Concurrently, Professor Chipara worked on several publications with his collaborators on assessing and configuration of hearing aids.

COOK, SUSAN W, Associate Professor, Psychological and Brain Sciences, 12 years of service, half time for academic year

Title: Computational Modeling of Interaction in Educational Contexts

During her PDA, Professor Cook acquired new knowledge and skills in computational modeling and in using motion capture and virtual reality for empirical studies. These skills will form the basis of her research moving forward and will be directly taught to undergraduate and graduate students. The research that will be conducted using these skills will be used to develop principles and technologies for improving teaching and learning in the state of Iowa and beyond. Professor Cook was also able to enhance her teaching materials and skills during this time, directly benefiting undergraduate and graduate students at the University of Iowa.

CRAMER, BRADLEY D, Associate Professor, Earth and Environmental Sciences, 8 years of service, spring

Title: High-Resolution Event Stratigraphy of the Altajma Core, Gotland, Sweden

Professor Cramer focused on research and completion of her National Science Foundation (NSF) Career Grant. Ten research manuscripts were either published, are in press, or have been submitted as a result of this PDA, and two more were written and will be submitted shortly. Professor Cramer also founded a new International Subcommittee within the International Union of Geological Sciences, which is a UNESCO organization. This will raise the international profile of the University of Iowa within the discipline. In preparation for the forthcoming semester, Professor Cramer also revised the course material for EES:1115 - History and Science of Oil, in preparation for its transition to an online format due to COVID-19 restrictions on campus.

CURTIUS, ANNY D, Associate Professor, French and Italian, 17 years of service, spring

Title: Unshackling the Memory of Slavery: the Ecodialectics of Landscape and Seascape Memorials

Professor Curtius' book project examines literary texts and innovative slavery museums, memorials and cemeteries in the US, France, the Caribbean and the Indian Ocean. She made substantial progress on her manuscript by bolstering the theoretical framework of her introduction, revising drafts of three chapters and writing two additional chapters. Her students in "Slavery

museums, memorials and statues” derived direct benefit from her research and she plans to offer redesigned versions of this course at the 1000 and 6000 level in 2021-22. She conducted research at a museum in Guadeloupe, presented her work as a guest speaker at two conferences and was selected to serve on the Humanities for the Public Good Advisory Board in 2020-21. Her interdisciplinary project weaves together her service, teaching and research, contributes to the UI’s international mission and its commitment to Diversity, Equity and Inclusion. It also educates the Iowa community and society broadly about the ways in which slavery museums and memorials allow new memory communities to be formed and subjectivities to be impacted, tested and challenged through transformative experiences.

DAVIDOVIC, JOVANA, Associate Professor, Philosophy, 8 years of service, fall

Title: Ethics of Autonomous Weapons Systems

Professor Davidovic completed three journal articles, significantly revised another and has one journal article and one book review in progress. The central topic Professor Davidovic addressed during her PDA was the ethics of algorithms in military settings. Specifically, Professor Davidovic co-authored a paper on ethically auditing algorithms, she co-authored with a unit leader from Navy Seal Team 1 a paper on ethics of soldier enhancements, and she authored a paper on the military’s political neutrality. She also worked on a number of other papers including on liability to defensive harm in war, on international law as it relates to regulation of military algorithms (to be presented in April) and a book review on ethics of cooperation in war. Professor Davidovic has also taken this time to develop a Seminar in Ethics (to be taught in Fall 2020) on ethics of algorithms. Professor Davidovic closely collaborated with scholars at Georgetown Law School, the Navy Postgraduate College, West Point Academy and the Naval Academy, some of whom will be visiting Iowa as a part of the Challenge Grant development she worked on.

EKDALE, BRIAN R, Associate Professor, Journalism & Mass Communication, 9 years of service, spring

Title: Digital Work in Kenya’s Media Industries

Professor Ekdale made significant progress on his research into digital work in Kenya. This included analyzing interviews conducted with 30 app car drivers (e.g., Uber drivers) and 30 microenterprise workers (i.e., very small business owners) on previous research trips to Kenya in August 2019 and January 2020. He also conducted a thorough literature review on foundational and contemporary scholarship on labor in digital media industries in preparation for an upcoming book manuscript. As the co-director of the Algorithms and Social Media Working Group, Professor Ekdale also made progress on several related research projects, most significantly a funding proposal that was awarded a 3-year, \$1,000,000 grant by the Department of Defense’s Minerva Research Initiative. Professor Ekdale is the PI for this grant, “Algorithmic Personalization and Online Radicalization: A Mixed Methods Approach.”

FAGAN, SARAH, Professor, German, 26 years of service, fall

Title: “Moving forward”: from Euphemism to Discourse Marker

Professor Fagan worked with a group of graduate students in Linguistics on a corpus-based study to document the pathway of change in the historical development of the expression “moving forward,” from its emergence as a euphemism to its use as a marker of a boundary in discourse (e.g., as a signal of a new topic). They designed a coding system, coded (categorized, semantically and pragmatically) all instances of “moving forward” in the more than 560 million words of text in the Corpus of Contemporary American English (COCA) collected from 1990 through 2017, and are preparing presentations on the study methods and results for University of Iowa audiences during the Spring 2020 semester. The project provided research opportunities for University of Iowa students and may also lead to the development of a new course on corpus

linguistics. The study results will contribute to their understanding of the role of discourse markers in the organization of spoken and written texts as well as provide insights into language change.

FIGDOR, CARRIE, Professor, Philosophy, 13 years of service, half time for academic year
Title: Psychology in transition and its Moral, Social, and Theoretical Implications
Professor Figdor divided her sabbatical into two parts, as she won two fellowships for her projects. The first part (July 2019-March 2020) was at the University of Sydney as an Anderson Fellow. Her sponsor was Dr. Paul E. Griffiths, a prominent philosopher of biology who is head of the Theory and Methods in the Biosciences research group. Professor Figdor led a weekly graduate-level seminar on “Diverse Minds”, with prominent guest speakers. She participated daily in Dr. Griffiths' research group. She also gave many talks throughout Australia and in South Korea, Germany, Belgium, Austria, and New Zealand. She wrote papers, on issues in the foundations of psychology and the moral status of nonhuman animals. This material is included in her courses in philosophy of mind and philosophy of cognitive science. The second part (March-August 2020) was at the University of Edinburgh's Institute for Advanced Studies in the Humanities, where she was an American Philosophical Association Edinburgh Fellow. She participated in weekly work-in-progress sessions and gave her own work-in-progress talk, and gave talks at various universities in the U.K., Germany and the Netherlands.

FINAMORE, JOHN F, Professor, Classics, 37 years of service, half time for academic year
Title: Translation of Proclus' Commentary on Plato's Republic
Professor Finamore was the principal investigator, creating a translation with notes of the Greek text of the 5th Century A.D. philosopher Proclus' commentary to Plato's Republic. The Republic is Plato's most important and influential work; Proclus' commentary on it is the only extant commentary from the ancient Greek world. Professor Finamore is collaborating with Professors Baltzly and Miles of the University of Tasmania to publish the translations in three volumes with Cambridge University Press. This is the first translation into English of Proclus' work. Research was conducted at the American School of Classical Studies in Athens in October and November 2019; at the American Academy in Rome in February and March 2020; and at the University of Iowa. In June 2020 the completed manuscript was submitted to Cambridge University Press and is expected to be published in late 2020 or early 2021. Professor Finamore also completed and submitted two scholarly articles on Proclus (both of which will be published in two separate anthologies) and is completing a third in Summer 2020. Professor Finamore regularly teaches courses on ancient philosophy, which this project will enhance.

FINZEL, EMILY, Associate Professor, Earth and Environmental Sciences, 8 years of service, fall
Title: Prospectus: Fingerprinting an ancient fluvial-to-marine transition zone in the stratigraphic record using geochemical approaches
Professor Finzel met all four goals of her PDA, in addition to other undertakings. In addition to the original goals that were accomplished during the award period, Professor Finzel submitted four NSF proposals for other projects that are still pending. Within her research group, one undergraduate accompanied her to a conference in Rome, two undergraduates were trained on the new XRF equipment and are working on research projects, and her Ph.D. student had the opportunity to travel internationally for research and develop his own scientific network. The new XRF itself is an ideal ‘first analytical equipment learned’ for students and will be an excellent addition to classroom pedagogy for both Professor Finzel and other faculty within and outside her department. Outcomes from the award also have benefits for society as it is expected to substantially enhance the understanding of fluvial-to-marine transition zones, which could have implications for studies related to climate change, paleoecology, and resource exploration.

GALVIN, JAMES A, Professor, Creative Writing, 36 years of service, fall

Title: James Galvin New And Selected Poems

Professor Galvin used his PDA to complete a “New and Selected” volume of his poetry. This involved writing several new poems and selected others from his eight volumes of published verse. Professor Galvin hopes his new works are of sufficient quality to stand next to the best poems he has written in his career since 1975. It also involved determining which are the indispensable poems, and which are not. Traditionally one’s collected works are published posthumously, meaning that a volume of “New and Selected” poems defines a poet for the remainder of his career. It is Professor Galvin’s hope that this definitive volume will have a major impact on American poetry, thus benefiting the University of Iowa, the Writers’ Workshop, the State of Iowa, and students and readers of poetry everywhere.

GOODMAN, SHAWN S, Associate Professor, CLAS-Communication Sciences & Disorders, 14 years of service, fall

Title: Identifying Precise Locations of Physiological Damage in the Auditory System

During his PDA, Professor Goodman strengthened two key research collaborations, collected and analyzed data, wrote journal articles, prepared scientific presentations, and submitted extramural research grants. Professor Goodman applied newly developed techniques for testing the inner ear and auditory nerve. These techniques yielded measurements that were available previously, providing a better understanding of the relationship between hearing test results and the underlying physiological mechanisms of hearing. One of the techniques shows promise for early detection of Meniere’s disease in humans, which may result in better treatment outcomes. Work completed during his PDA resulted in two published journal articles, three articles in preparation, two grant submissions, four accepted scientific presentations, and new material for two of Professor Goodman’s graduate level classes.

GORDON, COLIN, Professor, History, 26 years of service, fall

Title: Home Inequity: Race, Wealth, and Housing in the American City

The PDA gave Professor Gordon a jump start on a new project, undertaken in collaboration with Legal Services of Eastern Missouri and the St. Louis Metropolitan Equal Housing and Opportunity Center, on the history of racially-restrictive deed covenants in St. Louis and St. Louis County. The research team completed research at the City of St. Louis Records’ Office, identifying, cataloguing and mapping over 850 deed restrictions. This research formed the foundation for an Arts and Humanities Initiative (AHi) proposal, awarded and funded in November 2019. Professor Gordon submitted proposals to present preliminary results at upcoming meetings of the Urban History Association (Detroit, Oct. 2020) and the Social Science History Association (Washington, Nov. 2020). Professor Gordon will also submit an application based on this project to the regular National Endowment for the Humanities (NEH) competition in Spring 2020. The model of community-engaged scholarship developed for researching these deed instruments is also the basis for a new undergraduate class investigating the use of such restrictions in Iowa.

GORDON, JEAN K, Associate Professor, Communication Sciences & Disorders, 19 years of service, fall

Title: Facilitating fluency in aphasia

Professor Gordon primarily carried out work towards the completion of her Facilitating Fluency project funded by the American Speech-Language Hearing Foundation (ASHF). The goals of the project are to identify factors contributing to fluent language production in individuals with aphasia (a language disorder resulting from stroke), and to use this information to develop a more useful and reliable method of measuring fluency in clinical practice. Professor Gordon completed the first phase of the project and made significant progress on the remaining phases. To date, the project has generated two peer-reviewed journal articles (in press), two conference presentations and a third conference submission and has been covered by local and national press. The findings

will be directly incorporated into coursework for speech-language pathology students. Professor Gordon also conducted background research for grant proposals extending the research to clinical practice and to investigation in other populations with disrupted language fluency.

GRUCA, THOMAS S, Professor, Marketing, 29 years of service, fall

Title: Individual trader behavior in media-focused prediction markets

Professor Gruca conducted research in the areas of prediction markets, health care and marketing models. He worked on two prediction market projects. He digitized written trader forecasts from 13 movie markets for a database to support Ph.D. student research. In a new study, he examined the impact of investing diaries on portfolio choices and trader returns in prediction markets. In health care, he worked on a new study on access to prenatal care due to the closure of hospital labor and delivery departments in Iowa. He created state-level projections of physician supply for a legislative report. He revised a study on the supply of primary care providers in Iowa. These three studies on the physician and non-physician workforce in Iowa will give state leaders better insights into the challenges of providing access to Iowans in rural areas. He also completed other new projects on workspace satisfaction, patterns of market shares/ranks and the impact of online/offline word-of-mouth metrics on firm performance. He will incorporate findings from these latter studies into his marketing management class.

HAES, AMANDA J, Professor, Chemistry, 14 years of service, spring

Title: Enabling Nanotechnology Development for Public Health and Safety

Professor Haes used this PDA to establish new collaborations and develop ideas in nanosensing and metal and drug detection. Collaborations with experts who specialize in modeling, environmental science and disease problems were launched. One preliminary proposal was submitted and one grant funded. Plans to perform experiments to collect preliminary data for future full proposals were put on hold because of the pandemic-induced research ramp down. Most presentations were cancelled because of the pandemic. Instead, Professor Haes refocused efforts to work with her group members to write and submit manuscripts for publication. Two manuscripts have been published, two manuscripts are pending, and three manuscripts will be submitted in the next two weeks. During remote working conditions, Professor Haes interacted closely with five graduate students and three undergraduate students working to build community and a remote scientific community.

HAN, WEIMIN, Professor, Mathematics, 29 years of service, fall

Title: Numerical Analysis of Time-dependent Hemivariational Inequalities with Applications in Contact Mechanics

During his PDA, Professor Weimin Han conducted research on mathematical analysis and numerical solution of hemivariational inequalities (HVIs). HVIs are highly challenging problems with a wide variety of applications. In mathematical terms, HVIs are nonsmooth and nonconvex problems, and are thus very difficult to study theoretically and numerically. Professor Han was able to achieve various research results. During this time period, he had five journal articles published or accepted for publications, four journal articles under review, and one article in progress.

HOENICKE-MOORE, MICHAELA, Associate Professor, History, 13 years of service, spring

Title: The Varieties of Patriotism: Americans Debate Their Country's Role in the World From the 'Good War' to Vietnam

Professor Hoenicke-Moore conducted archival research at MIT (Harold Isaacs collection on African Americans and the world) and drafted new material for her book *The Varieties of Patriotism: Americans Debate Their Country's Role in the World from the 'Good War' to Vietnam*. The study examines foreign policy views at the grassroots level, highlighting the voices of soldiers,

African Americans, and immigrants. The book documents how citizens of Iowa and the country in general, actively engaged with foreign policy and maintained deep connections with the world. Even though most of her scheduled research was disrupted by the pandemic, the PDA allowed Professor Hoenicke-Moore to complete three essays on this topic, participate in an international workshop on military chaplains in early March, develop new collaborations as a Fellow-in-Residence at the Obermann Center, and prepare two applications for major external fellowships. UI undergraduates will directly benefit from her work in the Learning Collaboratory Course Design which lead to a complete revision of the existing Europe and the US in the 20th Century and the newly designed course Behind the Headlines: Europe and the U.S. in 2020.

JORGENSEN, PALLE E, Professor, Mathematics, 37 years of service, spring

Title: Networks, stochastic models, machine learning, and financial mathematics.

Building on a NSF Award #1743819 CBMS Conference: "Smooth and Non-Smooth Harmonic Analysis" Professor Jorgensen delivered 10 research lectures. Professor Jorgensen's research during the PDA period has direct benefit to teaching/students at the University of Iowa. For example, his research includes the kind of stochastic calculus which lies at the core of financial engineering: design of derivative securities. Professor Jorgensen has designed and realized a new interdisciplinary course Intro to Financial Mathematics, Math 4250. Students in the course come from math, statistics, actuarial science, economics, and finance. This course responds to both student demands, and to the state of Iowa and society generally. The Insurance and Financial industry are major factors in the economy of the State of Iowa. The students from Professor Jorgensen's course get jobs in industry. Another direct benefit to students is Professor Jorgensen's direction of PhD theses. In spring 2020, he directed three new Ph.D. theses; one in financial mathematics. Professor Jorgensen completed eight research papers in 2020, refereed in top ranked journals.

JUST, CRAIG L, Associate Professor, Civil-Environmental Engineer, 9 years of service, fall

Title: Water, Sanitation, and Hygiene Interventions for Health Improvement in Resource-constrained Communities

Professor Just focused on novel drinking water disinfection options for small communities in rural Nicaragua and on alternative wastewater treatment options for communities in Iowa, and beyond. In Nicaragua, Professor Just's research was facilitated by EOS International through several planning meetings and week-long trips to Nicaragua in October and November 2019. As a result, Professor Just applied for federal funding from USAID for his development work in Nicaragua entitled SMART Chlorinators: Sensor-Managed Ambulance Response Telemetering Chlorinators. Professor Just hopes USAID funding will become a significant part of his research portfolio. For Iowa wastewater, he worked with the Iowa Economic Development Authority, the Iowa Department of Natural Resources, consulting engineers, the Iowa Water Environment Association, and officials from the City of Iowa City to further develop the Iowa Wastewater Research Program. The multi-year effort has the potential to positively impact hundreds of Iowa communities, over one million Iowans and each of Iowa's 99 counties.

KITCHEN, ANDREW, Associate Professor, Anthropology, 8 years of service, spring

Title: Critical Examination of the Timescale and Emergence of Pathogens in Human History

Pathogens and parasites have had a significant impact on human populations since the origin of our species. During his PDA, Professor Kitchen planned to travel to the University of Wisconsin and the Pasteur Institute (Paris, France) to research the timescale of pathogen emergence in humans but was unable to do so because of pandemic-related restrictions on travel. Instead, Professor Kitchen developed complementary lines of research related to the history of Native Americans and an important human pathogen. Key outcomes of this PDA include the publication of two articles, the submission or advancement of two additional manuscripts, the submission of

one grant application, and the development of two additional grant projects. One undergraduate course was re-engineered. Information collected will be used to update lectures and assignments for at least three courses. Data gathered for grant proposals and article manuscripts will provide research projects for undergraduates.

KRUGER, MARIE L, Associate Professor, English, 15 years of service, spring

Title: "From historical trauma to dark tourism: Constitution Hill in the popular South African imagination"

Professor Kruger made significant progress toward the completion of her book project on "Therapeutic Commodities: Gender and Trauma in Contemporary South African Visual Culture." Her work focuses on the representation of traumatic experiences on a heritage site in Johannesburg and draws attention to the multiple uses of traumatic heritage: to work toward social justice and racial reconciliation but also their appropriation for economic and political profit. Though Covid-19 prevented Professor Kruger from conducting research in Johannesburg, she was able to engage in a virtual collaboration with colleagues from South African and European universities on an interdisciplinary project entitled "Cultures of Populism: Institutions and Hegemonic Practices" that resulted in the publication of her article in a prestigious African Studies journal. Professor Kruger's scholarship in trauma studies and visual culture has resulted in several innovative undergraduate and graduate courses. Her expertise significantly contributes toward international engagement on campus, and thus supports the university's mission to provide students with a transformative educational experience.

LEDDY, JOHNA, Associate Professor, Chemistry, 29 years of service, fall

Title: The Spin in Catalysis

Professor Leddy and her students have discovered that micromagnets on electrodes increase rates of electron transfer reactions. Efficiency, energy, and power of batteries, fuel cells, and solar cells increase by 40%. During the PDA, she worked on fundamental models for the magnetoelectrocatalysis that arises from electron spin interactions with magnetic fields and gradients. Outcomes include: better refined theory; one paper under review and two manuscripts near completion, all with student co-authors; and the basis for one final report and two planned proposals. Papers were presented and symposia organized. New ideas and models inform teaching and student research. Professor Leddy focused on understanding magnetic effects on catalysis and vetting models with experimental and literature data. The models anticipate better designs for advanced technologies and catalysts. This unique Iowa-based research promotes advanced technologies important in Iowa that include ethanol and hydrogen fuel cells and better capture of wind energy. Worldwide, consider the impact of a 40% increase in battery, fuel cell, and solar cell efficiencies that micromagnet modification enables.

LEDOLTER, JOHANNES, Professor, Management Sciences, 42 years of service, half time for academic year

Title: The Statistical Analysis of Textual Information

The PDA supported the research and the writing of the book *From Words to Meanings through Numbers: Analyzing Textual Information* (joint project with Professor Lea S Vandervelde of the College of Law). The book will be published by Sage Publishing, in their book series on Quantitative Applications in the Social Sciences. Today, a lot of information comes in the form of text data, and the amount of text information currently available is massive. The objective of the monograph is to provide an introduction to the statistical analysis of text data that can be understood by advanced undergraduate and graduate students in the social sciences, literature, history, and data science. The PDA also supported Professor Ledolter's work at the Center for the Prevention and Treatment of Visual Loss at the Iowa City VA Health Care System. As a statistician associated with the Center, she participated on several grants that have been funded

by NIH and the VA system. This work has led to several publications in Ophthalmology and the Visual Sciences.

LOGSDON, JOHN, Associate Professor, Biology, 17 years of service, fall

Title: Ancient DNA & Paleogenomics of Pleistocene Fauna from Natural Trap Cave

Professor Logsdon spent four months in the Paleogenomics Laboratory of Professor Beth Shapiro at UC, Santa Cruz. During this time, he was immersed in learning and becoming proficient in the technical issues for extracting ancient DNA (aDNA) from fossil bone, as well as generating and analyzing sequence data from such specimens. Professor Logsdon spent a majority of his time working in the lab: preparing fossil bone specimens, extracting DNA and generating aDNA "libraries" for high throughput sequencing. In sum, he prepared over 100 fossil samples, from which over 55 DNA extractions were performed. He generated over 60 sequencing libraries, resulting in >10 billion base pairs of DNA sequence. Although analyses of these specimens are not yet complete, most of the initial specimens sequenced could be identified as rabbits. Sequence data from these samples are currently being analyzed for confirmation and eventual publication. No formal products have yet emerged, but it is anticipated that at least one publication and several future collaborative research projects (NSF-fundable) will result from this project that remains ongoing with the participation of scientists in Professor Shapiro's lab.

MACKEY, MICHAEL A, Associate Professor, Biomedical Engineering, 20 years of service, fall

Title: Software Tools For The Course Systems Biology for Biomedical Engineers, BME:5435

Systems Biology is a discipline that merges mathematical modeling with biophysics and shows promise for improvements in the understanding and treatment of many human diseases. The Cellular Engineering curriculum in Biomedical Engineering at Iowa has a tradition of being a leader in Biomedical Engineering education, and students in this program will benefit from new coursework in Systems Biology under development by Professor Mackey. This PDA supported the development of a software component for a new Systems Biology textbook being written by Professor Mackey. During the award period he was a Fellow-In-Residence at the Obermann Center for Advanced Studies at the University of Iowa, where he implemented the needed software and made other progress on his upcoming textbook, including the identification of a potential publisher for the work.

MALKOVA, ANNA, Professor, Biology, 7 years of service, fall

Title: The structure and function of the molecular intermediates of break-induced replication

Break Induced Replication (BIR) is one important pathway of double-strand break (DSB) repair. During her PDA, Professor Malkova developed important skills, including electron microscopy (EM) and droplet digital PCR required for the analysis of BIR molecular intermediates. While using these methods, Professor Malkova contributed to the development of new approaches to the analysis of kinetics and the molecular mechanism of BIR. Applying these new methods and approaches will allow her to discover new genes involved in BIR, to characterize BIR regulation and the mechanisms responsible for genomic destabilization associated with BIR. Professor Malkova wrote three research papers that will be submitted for publication to high-impact journals and contributed to writing a collaborative manuscript that has been submitted to "Genes and Development." Publishing these manuscripts will help to secure funding to continue research in Professor Malkova's lab. Professor Malkova continued mentoring graduate and undergraduate students in their independent research, including designing and performing of their experiments as well as writing their research manuscripts and Ph.D. thesis.

MARTIN-ESTUDILLO, LUIS, Professor, Spanish and Portuguese, 15 years of service, fall

Title: Francisco de Goya and the Mystery of Reading

Professor Martín-Estudillo completed four out of five chapters of his upcoming book on the impact of reading on the work of the Spanish artist Francisco de Goya. His book explains how some of Goya's most influential artworks show very different types of readers—from aristocrats to animals—whose attitudes toward texts are often perplexing for spectators today. The project provides a historically and theoretically informed interpretation of these reading scenes, which appeared at a critical juncture in the development of Western culture. During Goya's lifetime (1746-1828) the mutation from "intensive" to "extensive" reading practices stirred intense debates in which he engaged creatively. His works indicate that his interest in reading went well beyond a mere recognition of the increasing social relevance of this phenomenon. This study draws on contributions from several disciplines (including philosophy, art history, literary studies, and history of medicine) to examine Goya's art. It also improves our understanding of how the way we encounter written and visual texts has developed since then. The findings will become part of the undergraduate course on Spanish Visual Culture.

MASON, SARA E, Associate Professor, Chemistry, 10 years of service, spring

Title: In Silico Sustainable Materials Discovery Guided by Density Functional Theory and Machine Learning

Professor Mason leads a research group that uses theory and modeling, often in close collaboration with experimentalists, to provide molecular-level insight about the structure, stability, transformations, and reactivity of nanomaterials in the environment. The global covid-19 pandemic disrupted the planned activities. During the PDA, Professor Mason met regularly with group members (five Ph.D. students and one postdoctoral scholar) to discuss research progress and to write, revise, and edit manuscripts for peer review. During that time, Professor Mason has seven co-authored manuscripts accepted for publication in peer-reviewed journals, with more under revision and preparation. One research grant on which is Professor Mason is a co-PI, has been recommended for funding by the National Science Foundation. Professor Mason took on a role as a specialist editor for a journal aligned with her research and was appointed to the executive committee of the NSF Center for Sustainable Nanotechnology, a consortium research collaboration.

MAURY, WENDY, Professor, Microbiology, 21 years of service, other (May-October 2019)

Title: Defining the phenotype of macrophages that are permissive for Ebola virus entry

Professor Maury performed a PDA that identified initial cells supporting Ebola virus infection. These studies were performed in the Department of Biomedicine, University of Bergen, Bergen, Norway. To characterize the phenotype of the infected cells, mice were infected with a model virus, having the same cellular tropism as Ebola virus. Cells from infected mice were harvested for analysis over 48 hours. Blood cells and cells from the peritoneal cavity of infected mice were characterized by single-cell mass cytometry (CyTOF). This analysis allowed simultaneous evaluation of the phenotype of cells and virus infection. CyTOF data are currently being analyzed to define early cellular targets of virus infection and to understand changes in cell composition within the blood and peritoneum during virus infection. These studies define initial cell types infected with Ebola virus for the first time, providing insights into cells that should be targeted by therapeutics. As no therapeutics against Ebola virus currently exist, the information gained will focus future studies, including those within the Maury lab that involved teaching of undergraduates, graduate students and post-doctoral fellows.

MCGUIRE, STEVE, Professor, Art and Art History, 29 years of service, spring

Title: Blue Dot – Building a Bicycle

Professor McGuire created the project, Blue Dot Arrowhead - Single Speed is centered on riding the Arrowhead Trail, International Falls, MN, January 27, 2020, on a titanium bicycle he built for the event, documenting the creation of the bicycle, and then exhibiting the Bicycle at Bespoked,

the International Handmade Bicycle Show in Bristol, UK, April 2022 (rescheduled). In January 2020, Professor McGuire built the titanium bicycle, Blue Dot, recording the process. On January 27, he participated in the Arrowhead 135 Ultra and recorded the 35h:37:00 event with satellite tracking. In March 2020, he cut short his PDA to deal with the global pandemic as it effected the School of Art & Art History. He will edit the video and prepare the bicycle for exhibition at Bespoked and NAHBS. He will use the video for instruction in the new course, TDSN 3250, Bicycle Design and History. Professor McGuire's project comes on the heels of expanding the School of Art & Art History's curricular relationship with the College of Engineering (COE) and his courses Fabrication & Design: Hand-Built Bicycle and Hand-Built Bicycle II being incorporated into the COE curriculum.

MENTZER, RAYMOND A, Professor, Religious Studies, 19 years of service, spring

Title: Training and Disciplining Protestant Pastors in Early Modern France

Professor Mentzer focused on research for a journal article and eventual book chapter on misbehavior among pastors serving the Reformed Churches of France in the 16th and 17th centuries. As events of the 21st century have made clear, pastors can behave badly. Early modern pastors were likewise not without their faults. The Protestant Reformation took special note of the relaxed morals of the medieval clergy. Protestant leaders judged inappropriate sexual conduct especially troublesome. They sought remedy in a married clergy, which they felt was the more natural, biblically sanctioned arrangement. Ideally, the pastor was a model head of household, setting an example for the congregation in his interactions with wife, children, and servants. Unfortunately, the approach proved problematic. Despite strenuous disciplinary and educational efforts, some French Protestant pastors sexually assaulted parish women. Most offenders received only minor punishment. Professor Mentzer expects to publish an article in the next year and envisions completion of the book thereafter. His research will also enhance his undergraduate and graduate teaching.

MOORE, CATHLEEN M, Professor, Psychological and Brain Sciences, 13 years of service, spring

Title: Applications of Neuroimaging to Post-Sensory Visual Information Processing

Professor Moore's project was to collaborate with a colleague at the University of Arizona on a study using brain imaging to assess whether specific aspects of visual processing that are important to everyday tasks, such as reading and driving, function differently in peripheral vision compared to central vision. This question, which Professor Moore has an R21 grant to study, is significant for understanding quality-of-life concerns from individuals suffering from loss of central vision due to diseases such as macular degeneration. Because of the Covid-19 situation, the project could not proceed as planned. Instead, Professor Moore completed analyses on two data sets that she had already collected and prepared them for publication. These will serve as a basis for extending the exploratory R21 project to a broader R01 application. Professor Moore also submitted two related NIH R01 applications, one with a colleague in the Psychological and Brain Sciences department and another with a colleague in the Radiology department in the CCOM. Finally, she submitted seven journal articles for publication (four are in press, three are under review).

MOORE, DANIEL, Professor, Music, 23 years of service, spring

Title: Collector's Items: A Sculpture in Sound

Professor Moore's PDA to create an audiophile-quality collaborative recording that recombines recorded material with new performances created by himself and some of the world's top percussionists was halted as a result of the COVID-19 pandemic and lockdown. While in the early stages of developing this ambitious long-term project, Professor Moore was forced to turn his attention to assuring that his students (20 undergraduate and graduate percussion majors) made

a successful transition to on-line learning during Spring 2020. Professor Moore then shifted his focus to the creation of several smaller yet unique projects for the remainder of the award period and summer. This included a music video about hand hygiene utilizing hand washing protocols recommended by the World Health Organization (WHO), along with several other music video projects. These videos have received thousands of views on YouTube and continue to enhance outreach and visibility for the University of Iowa. As the effects of the pandemic are far from over, the proposed project is still currently on hold, however, Professor Moore plans to continue work on the Collector's Items recording.

NIKOLAS, MOLLY A, Associate Professor, Psychological and Brain Sciences, 9 years of service, spring

Title: Impact of Digital Media Use on Adolescent Mental Health

During the PDA, Professor Nikolas's research focused on the impact of social media use on mental health problems in youth. Professor Nikolas completed a comprehensive literature review and her findings indicated robust and reciprocal associations between increased time using social media and symptoms of depression, ADHD, and anxiety. Additionally, Professor Nikolas collected data on this topic in her lab aided by undergraduate research assistants and analyzed these data following participation in virtual consultations and trainings. These preliminary data are included in a grant application submitted to the National Institutes of Health in October 2020 that focuses on mapping predictors of mental illness trajectories during adolescence. Professor Nikolas has incorporated this new knowledge into her Childhood Psychopathology undergraduate course by having students critique this literature and develop their own ideas for future studies. Further, Professor Nikolas is slated to give two presentations to parent and ADHD support groups in 2021 regarding social media use and its impact on mental health in youth.

OSBORN, TRACY, Associate Professor, Political Science, 13 years of service, spring

Title: Increasing Women's Representation? Women Candidate Groups in the U.S.

During her PDA, Professor Osborn completed four chapters of a book manuscript. This book studies the groups that encourage women candidates to run for political office. The focus of the book is about how political parties differ in their recruitment of women candidates for office. Professor Osborn also completed an invited fellowship position at the Policy Institute at King's College, London, during the assignment. Professor Osborn has used the new information on women candidate groups in her Women and Politics in the US and Election 2020 classes. Additionally, she has engaged in several talks on campus and around the state of Iowa to inform citizens about how to increase the number of women who run for office from both political parties. Her work will help women candidate groups directly, as well as increase how many women they recruit and train to run for state and local offices. Professor Osborn's time at King's College, London, also gave international exposure to research ongoing at the University of Iowa.

PRAHLAD, VEENA, Associate Professor, Biology, 8 years of service, fall

Title: Calcium Imaging of neuronal activity in *C. elegans*

Professor Prahlad and collaborators found that mutations that affect mitochondrial Complex I activity result in a surprising increase in the sensitivity of animals toward odorants sensed by the chemosensory neuron, AWC in *C. elegans*. This led to hypothesize that the absence of Complex I function compromised the dynamics of calcium uptake by mitochondria, resulting in a change in the threshold for neuronal activity. The goals of this award were 1) to evaluate and identify the most appropriate technique to visualize live behaving *C. elegans* while stimulating recording the activity of neurons and 2) identify the optimal genetically encoded optical sensors for this application and generate the appropriate strains for our application. The experiments were tailored to record Calcium in the AWC neurons in wild-type animals and animals that harbored mutations in Complex I. The award greatly benefited the training of her graduate student who

drove the work, completed step (2) and made considerable progress in step (1). Dysfunctional mitochondria are associated with autism and related syndromes where sensory processing is disrupted. These studies will add to the understanding of these syndromes.

QIAN, HAIFENG, Associate Professor, Urban & Regional Planning, 6 years of service, spring
Title: Inequality in U.S. Cities: The Roles of Entrepreneurship and Labor Market Skills
Professor Qian spent his PDA at MIT as a visiting associate professor and worked on a few research papers. Following his PDA proposal, he and his collaborator studied why some U.S. cities have higher levels of income inequality than others from the perspectives of entrepreneurship and human capital. They found that new business formation reduces income inequality in cities, while self-employment increases income inequality. After considering these two types of entrepreneurial activity, human capital is not significantly associated with income inequality in cities. Professor Qian will integrate these research findings into his UI classes "Economics for Policy Analysis" and "Economic Development Policy" where he covers the inequality topic. This research also informs policymakers in (and beyond) Iowa that encouraging new firm formation is an effective economic development policy.

RAHMATALLA, SALAM F, Professor, Civil-Environmental Engineer, 13 years of service, spring
Title: A Book titled: Discomfort in Whole-body Vibration
Professor Rahmatalla used his PDA to draft a book titled: Prehospital transport and whole-body vibration. The proposal for the book and a sample chapter were submitted to Elsevier for peer-review evaluation. Professor Rahmatalla is planning to send the final draft of the book to Elsevier by the end of 2020. Professor Rahmatalla worked on many peer-reviewed articles and manuscripts and on several proposals. The work that has been done during this PDA has allowed him to closely focus on his research goals and to use his work to fill a gap in the literature. The proposed book is unique in terms of providing key information to the medical and technical communities in layperson language regarding the effect of whole-body vibration on safety, wellbeing of patients, and development of transport systems. This will benefit people in Iowa, US, and the whole world in civilian, natural disaster, and military applications. The book could be used as teaching material in the areas of biomechanics, ergonomics, human factors and emergency medicine.

RAND, JACKI T, Associate Professor, History, 22 years of service, fall
Title: Jim Crow's Red Children and the Rise of Tribal Self-Determination
Professor Rand reviewed field notes from her research in Neshoba County, Mississippi. She also consulted additional secondary sources for specific subjects, including Post-WWII US development policies and initiatives, the War on Poverty, and Martin Luther King, Jr.'s confrontation with white supremacy. Both activities led Professor Rand to rethink previously written chapters. Professor Rand rewrote the first chapter and chapter outlines and sent them out to two outside readers, internationally recognized scholars in her field. The PDA also allowed Professor Rand to develop two new courses on the subject of 20th century indigenous women which she taught for the first time in Spring 2020. As the only visible Native American scholar in CLAS, her presence, course offerings and research are critical to the university's diversity goals. Her courses include references to the history and contemporary life of the Meskwaki people and other communities in the Midwest. The PDA offered the necessary time to review previous work that Professor Rand will present at two prestigious conferences and to marry her research and writing with her course goals.

REISINGER, WILLIAM M, Professor, Political Science, 35 years of service, spring
Title: Corruption and the Public's Support for their Leaders

Professor Reisinger conducted statistical analyses of public opinion data, which he and colleagues had previously collected, about citizens' interactions with corrupt officials in four post communist countries and how those interactions influence the citizens' political outlooks. Based on these analyses, he wrote four new chapters for a book-length manuscript. These chapters, together with material previously written, bring the planned book near completion. Corruption, including low-level exchanges involving everyday citizens, is increasingly understood to be a major challenge to effective governance. The findings in the book will benefit ongoing debates about how best to reduce corruption. Professor Reisinger also completed final revisions of a forthcoming article and initiated work on a conference paper presented in August 2020 which will then be revised and submitted for publication as a journal article. With a significantly greater understanding of the patterns shown by the survey data, he will incorporate the findings into new sections of two undergraduate courses.

SAHA, PUNAM K, Professor, Electrical-Computer Engineer, 14 years of service, fall

Title: Simplicial Topology and Geometry and their Applications to Quantitative Medical Imaging
Professor Saha's PDA was valuable to initiate new research collaborations and establish his international leadership and visibility. He spent one month at the Centre for Image Analysis, Uppsala University, Sweden and established productive collaborations. During this period, he delivered one plenary and two keynote talks at three international conferences. Professor Saha received the IEEE Fellow award, applied for one U.S. patent, and published, accepted, revised or submitted eight papers at reputed journals and five papers at peer-reviewed international conferences. During this period, he has applied for two National Institutes of Health grants and accomplished research results, which will benefit future research and grant applications relating medical image segmentation and quantitative structural analysis on musculoskeletal, pulmonary and neuro-imaging research. During this period, he studied on theory and algorithms related to simplicial topology and geometry and recent advancements in similar topics, which will develop into a new graduate level course.

SAUDER, MICHAEL E, Professor, Sociology, 15 years of service, half time for academic year

Title: Inequality and Luck

Although the idea of "luck" is a very common one in everyday discussions, we currently know little about how perceptions of luck vary across social groups or how these perceptions relate to views about life chances and success. Professor Sauder completed data collection and analysis on two large projects during the PDA: he conducted over 100 interviews with a national sample of adults from different social backgrounds and undertook a comprehensive content analysis of over 1000 articles in major newspapers both before and after COVID. This work resulted in new findings into who believes in luck, how perceptions of luck are tied to success, and to which areas of life (e.g., relationships, health, jobs, sports, economic outcomes) people are most likely to apply luck and resulted in two academic articles and the foundation for a book proposal. Professor Sauder conduct this research with the help of multiple graduate and undergraduate students and used it as a training tool in study design and methods. Professor Sauder is also incorporating the findings and methodological innovations into his undergraduate courses.

SCHLESINGER, LISA R, Associate Professor, Theatre Arts, 6 years of service, fall

Title: The Iphigenia Project: Multidisciplinary Stories of Women Refugees

During her PDA Professor Schlesinger continued work on the Iphigenia Project, a multi-year interdisciplinary series of performances focused on the refugee crisis, begun in 2014. She completed Iphigenia Point Blank: Story of the First Refugee for the New York City premiere in fall 2020; and researched and wrote Ruinous Gods: Suites for Sleeping Children, a new opera-theatre piece, composed by Lebanese composer Layale Chaker (YoYo Ma's Silk Road/Daniel Barenboim's Divan Orchestra). Professor Schlesinger presented on The Iphigenia Project at the

19th Conference on Diversity in Organizations, Communities and Nations: Border Crossing Narratives, in Patras Greece. Professor Schlesinger's artistic research in the field of international theatre and social change supports her presence in the national and international theatre. As professor of playwriting and co-head of the Iowa workshop, staying current in new play development, production and scholarship, and practices in supporting diversity are an integral component of the programs' curriculum, excellence and prominence in American theatre and benefits students, the University of Iowa and Iowa communities.

SCHNELL, THOMAS, Professor, Industrial and Systems Engineering, 22 years of service, half time for academic year

Title: USAF Test Pilot School Human Systems Integration Curriculum

This PDA accomplished all five proposed objectives. 1) Ongoing identification and joint pursuit of research projects that further the objectives of both schools, accomplished, HAVE RHINO project \$198,630 and follow-on efforts. 2) Development of a plan to share available resources such as access to lectures and lecture materials, flight simulators, flight test aircraft, expertise, study participants, and project personnel, accomplished, developed TF-5310 Human Systems Integration (HSI) lecture, taught it twice, brought TPS students to OPL for Test Management project (TPS equivalent of senior design project). 3) Establishment of an ongoing academic relationship between TPS and University of Iowa, accomplished, OPL is hosting AFIT students for graduate work. 4) Enhancement of the University of Iowa's access to USAF test pilot graduates seeking to obtain Ph.D. degrees in engineering, accomplished, have one student in current Ph.D. pipeline. 5) Enhancement of the TPS Human-Systems Integration course through infusion of state of the art human state assessment techniques, accomplished, HAVE RHINO and related efforts of capstone events.

SHEA, CHRISTINE E, Associate Professor, Spanish and Portuguese, 8 years of service, spring

Title: Social sensitivity to different accents in Mexican children

Professor Shea's award period was interrupted by the novel coronavirus pandemic. While this required a quick shift in direction, she remained active and focused on new and continuing projects. As originally planned, Professor Shea used the first half of the semester to master the eye-tracker (experiment design and programming). By mid-March, her study was on schedule to commence at the study site in Querétaro, Mexico. Participant recruitment was under way and a research assistant had been contacted for on-site assistance. In addition to the study proposed as the focus of her PDA, Professor Shea put together a team to carry out a second research project, focused on bilingualism in Mexicans who have been re-patriated from the U.S. Due to travel restrictions, Professor Shea remained in Iowa City. She began to work on manuscripts for submission to journals and finishing projects that were pending with graduate students. Over the course of the PDA, Professor Shea submitted three articles to peer review journals and almost finished two additional manuscripts with PhD graduate students. She also finalized revisions to a chapter and a textbook chapter to be published in 2020.

SMOLIKOVE, SARIT, Associate Professor, Biology, 11 years of service, fall

Title: Applying RNA-seq techniques for the study of DNA damage response in *C. elegans*

Genomics is a growing sub discipline in the field of genetics. RNA sequencing analysis allows us to discover the wide array of genes that are being expressed under a specific condition. This is a particularly important method for identifying gene function in biological processes. In the PDA period Professor Smolikove developed skills that will help her to perform analysis of RNA seq data. Applying RNA seq approaches will allow her to discover new genes involved in the repair of broken DNA. This is a topic relevant for understanding the causes of mutations that are contributing factors to cancer. It will also help to understand how new mutations are created in the embryo and what mechanisms are implied to minimize their occurrence. During this PDA

Professor Smolikove also wrote two grant proposals. These will help to secure funding to continue research in her lab as well as open new directions in her research. She also published two papers involving her work in any aspect of publication. She continued mentoring graduate and undergraduates in research, in experimental design and interpretation, writing and hands-on help in executing experiments in the lab.

STERN, DAVID, Professor, Philosophy, 31 years of service, spring

Title: Mapping the Origins and Structure of Ludwig Wittgenstein's Tractatus Logico-Philosophicus (1922): A Bilingual Digital Humanities Edition of the Book and its Relationship to its Sources.

Professor Stern worked on a new translation of Ludwig Wittgenstein's Tractatus, one of a handful of key works of early analytic philosophy. During the award period, he concentrated on producing a draft translation of three texts: Tractatus itself, an earlier manuscript version of that book, and Wittgenstein's wartime diaries, written while composing the book. Thanks to a one-year NEH fellowship, he will continue work on this project during the 2020-21 academic year. Professor Stern is also at work on several essays on various aspects of this research and is developing a book-length genetic study of Tractatus, which will build on the results of this textual research. He organized the first of a series of online workshop on "Translating the Tractatus" and will edit a book of essays on that topic for Oxford University Press. The research will inform and enrich his teaching of courses on twentieth century philosophy (PHIL 3318), philosophy of language (PHIL 4589), and both undergraduate and graduate courses on Wittgenstein (PHIL 3847, PHIL 4377). He also plans to teach a graduate seminar in connection with this project after the fellowship.

STERN, FREDERICK, Professor, Mechanical Engineering, 37 years of service, spring

Title: Initiatives in Ship Hydrodynamics: Hydroelastic Wet Deck Slamming; and 3D Primary/Secondary Vortex Separation

Professor Stern conducted focused research on the development of global and local flow modeling and validation IIHR wave basin experiments for the free-running surface combatant maneuvering in waves; and research on high-fidelity multi-phase sharp-interface code development and verification and validation for high speed small craft fluid-structure interaction and multi-disciplinary optimization. This research is essential for maintenance of Iowa's internationally recognized leadership in ship hydrodynamics and continued Office of Naval Research funding. The products and outcomes are summarized as follows: 7 journal articles; 6 conference papers; co-editor of one book and co-author of four book chapters; co-organizer of two NATO AVT final reports and co-author of 10 chapters; one international guest lecture; two pending and one starting grants; co-chair on three NATO AVT Working Groups and two international workshops; and completed supervision of one Ph.D. student. These accomplishments insure Iowa's continued success in ship hydrodynamics research.

TATE, ERIC, Associate Professor, Geographical and Sustainability Sciences, 9 years of service, half time for academic year

Title: Validating Social Vulnerability Indicators and Advancing Methodological Skills

Professor Tate was highly productive, resulting in three primary outcomes. First, the dedicated time enabled completion of six journal manuscripts that examine flood risk and social vulnerability. Second, Professor Tate engaged in a new collaboration with colleagues from four other institutions to write and win a research grant from the U.S. Department of Housing and Urban Development. Through a second set of collaborations, First Street Foundation granted access to a new nationwide dataset of flooding that will be explored through three unfunded research projects. Third, Professor Tate delivered five research presentations to university and national audiences on the topic of social equity and flooding. The research outcomes will contribute directly to course content for two of Professor Tate's regular classes: Hazards & Society and Water

Resources. Meanwhile, the newly funded research grant benefits the Iowa via data collection and analysis collaboration with the City of Dubuque and the Iowa Economic Development Authority.

TINELLI, CESARE, Professor, Computer Science, 21 years of service, fall

Title: Theory and practice of Satisfiability Modulo Theories

This PDA allowed Professor Tinelli to focus on his research as well as seek new collaboration and funding opportunities. He did preparatory work for a planned monograph on Satisfiability Modulo Theories, an area of automated reasoning in which he is a renowned expert. He worked on two DARPA-funded projects on improving the resiliency of software to cyberattacks and on an ONR-funded project on securing and optimizing legacy software systems. He furthered his group's research collaboration with Amazon Web Services which led to the adoption at AWS of an automated reasoner co-developed by his group. He was awarded an unrestricted gift from AWS, two grant proposals, and several conference and journal paper submissions. The award will benefit students through research assistantships, exposure to cutting edge research in courses and in work done in Professor Tinelli's group, and better opportunities of post-graduation placement. Benefits for the state and the country include external funds for the University of Iowa, and technology transfer to industry. Long term benefits to society include the development of safer and more secure software.

TULLY, MELISSA, Associate Professor, Journalism & Mass Communication, 9 years of service, fall

Title: Misinformation, Media Literacy, and Democracy in Kenya

During her PDA, Professor Tully completed research on news, misinformation and social media in Kenya. She completed fieldwork, which consisted of observations, focus groups and interviews. This research has resulted in a conference acceptance and a manuscript under review at a peer-reviewed journal. This research is the starting point for a longitudinal study that will result in a book. In addition, Professor Tully wrote grant applications and applied for funding for her research. She was awarded a grant from a major organization in her field and a University of Iowa International Programs award for research for next summer and is awaiting decisions on other awards. In addition, Professor Tully submitted a number of articles to peer-reviewed journals. She also substantially revised a graduate course on "global digital media" that she is currently teaching. The course will benefit students as it exposes them to research and scholarship from the Global South. She plans to incorporate this work into future classes as well. This project contributes to society by examining the spread of misinformation and its potential effects in an understudied context, an emerging democracy in the Global South.

VISPOEL, WALTER P, Professor, Psych & Quant Foundations, 33 years of service, fall

Title: Extending Applications of Generalizability Theory to Inform and Improve Decisions Made from Assessment Tools

Cronbach and colleagues (1972) introduced "generalizability theory (G-theory)" as a framework to facilitate the design, evaluation, and modification of measurement procedures. However, G-theory has not reached its full potential due to restrictions in statistical relations allowed, unavailability of computer resources, and non-integration into contemporary measurement models. As part of his PDA, Professor Vispoel incorporated G-theory concepts into a structural equation modeling framework and developed instructional modules with computer code to perform G-theory analyses using popular statistical software. The new framework allows for more flexible relationships among assessment measure scores, analysis of ordinal and interval level data, use of both objectively and subjectively scored measures, and direct linkages of G-theory with latent state-trait and bifactor measurement models. To share benefits of this new framework with students, researchers, and practitioners both within and outside the university, Professor

Vispoel completed numerous manuscripts submitted for journal publication, conference papers and an outline for a new book on G-theory.

WADSWORTH, JOHN S, Associate Professor, Rehabilitation & Counselor Ed, 20 years of service, fall

Title: Best practices in note-taking in therapeutic relationships

The purpose of the PDA is to develop a line of research focusing on professional counselor reliability and validity of notetaking, consumers of counseling services perceptions of counselors who take notes, and translate that knowledge into best practices in note taking for practicing counselors. The method consisted of original research, awarding of training funding, and dissemination. Outcomes include the manuscripts: A Review of Notetaking in Counseling Session (in review) and Client Perceptions of Counselors who take Notes (preparing for submission), and the presentation: The legal Status of Process, Psychotherapy, and Supervision notes: Educating Master's Students. Dr Wadsworth received federal support for training Master's Rehabilitation Counseling Professionals with a start date of Oct. 2019. The applicant has benefited from a line of research that are a capstone to a successful writing and funded research. The PDA benefits training programs nationwide through educational training in note taking and Iowa through training funding and educational materials that promote best practices and reduce risk of litigation.

WARREN, STEPHEN A, Associate Professor, American Studies, 6 years of service, spring

Title: From Removal to Revival: Oklahoma Tribes and the Return of the Indigenous Midwest

In the Midwest, the twinned histories of violence against African Americans and Native Americans are routinely ignored. Historians have been drawn to Indian removal and Black exclusion in the Midwest. However, few understand the connections between these policies, and still more attribute their execution to federal policymakers. In *Histories of Myaamionki*, Professor Warren shows how these twinned histories worked at the local level. Intimate and racialized violence can tell us a great deal about citizenship, power and emergent understandings of race in the Midwest because the outcome of these policies was racial homogeneity. When combined, Black exclusion and Native American removal become deliberate public policies. Despite these policies, African Americans and Native Americans persisted in places designed for their elimination. Professor Warren's collaborative work with the Miami Tribe of Oklahoma sheds light in race-relations, power and citizenship.

XU, WEIYU, Associate Professor, Electrical-Computer Engineer, 9 years of service, spring

Title: Precise Analysis of Large-Scale Optimization Programs for Recovering Structured Data: a Unified Analytical Framework

With the support from the PDA, Professor Xu has accomplished the following research works: 1) information-theoretic limits on adversarial robustness of machine learning systems. 2) origination of a compressed sensing approach for large-scale, high-throughput and low-cost SARS-CoV-2 virus detection, which has a significant impact on mass testing for fighting COVID-19 pandemic; 3) investigation of high dimensional geometric tools for analyzing deep learning training performance and the performance of signal processing problems. This PDA contributed new course materials for machine learning and signal processing courses taught by Professor Xu. The PDA not only advances the theories and practices of signal processing, but also benefits Iowa by offering novel technologies for high-throughput COVID-19 mass testing.

ZHAO, KANG, Associate Professor, Management Sciences, 8 years of service, half time for academic year

Title: Mining Online Social Networks and Social Media for Better Healthcare

During the PDA period, Professor Zhao has been active in conducting research, disseminating knowledge, and serving the academic community. He collaborated with researchers from Chinese

Academy of Sciences and Tsinghua University. These new projects led to four journal submissions and one workshop submission. At the same time, he also kept working with existing collaborators (mainly in the U.S.) and advisees at the university and submitted four additional journal papers. He started two ongoing research projects related to COVID-19. Outcomes of these projects may contribute to peoples', including Iowans', fight against the pandemic. The projects also include collecting COVID-19 data that may be integrated into his pedagogical activities in the future. Before the COVID-19 outbreak in Jan 2020, he presented his research at nine universities. Each of his presentations included one slide to introduce the Business Analytics Department and its program offerings. The PDA also allowed him to take leadership roles in the academic community. He serves as co-chairs for two research workshops. He is also co-editing two special issues for two journals.

ZIMMERMAN, DALE, Professor, CLAS-Statistics & Actuarial Science, 34 years of service, spring
Title: Linear Models for Spatial Data Using R

Professor Zimmerman used his PDA to do research for a book on spatial linear models, and to write approximately 60% of the book. He also wrote two working manuscripts on topics in spatial statistics inspired by research he did for the book. He anticipates finishing the book in the summer of 2021. Professor Zimmerman is using the partially complete book as one of the required texts for his course in Spatial and Environmental Statistics this semester. Applied environmental scientists should find the completed book useful for the analysis of their data that are indexed by locations in space.