Contact: Rachel Boon

REQUEST FOR NEW PROGRAM AT IOWA STATE UNIVERSITY: MASTER OF HUMAN COMPUTER INTERACTION

Action Requested: Consider approval of the request by Iowa State University to establish a Master of Human Computer Interaction (M.HCI) in the Graduate College.

Executive Summary: The proposed M.HCI program will be the first in Iowa to offer a coursework-only HCI program specifically tailored to meet the diverse needs of professionals working in the industry. There is increasing demand for a coursework-only master's program by professionals working in the industry who are interested in pursuing an advanced degree in HCI with a focus on practice, rather than research. The proposed M.HCI degree will be offered exclusively through online/distance education. The proposed program addresses the Board of Regents Strategic Plan objective 1.1; "The Regent institutions provide clear pathways for students to enter, move through and complete their education and career goals."

Background:

❖ Description of proposed program. Human-computer interaction is a discipline concerned with the design, evaluation and implementation of interactive computing systems for human use and with the study of major phenomena surrounding them. Because human-computer interaction studies a human and a machine in communication, it draws from supporting knowledge on both sides. On the machine side, techniques in computer graphics, operating systems, programming languages, and development environments are relevant. On the human side, communication theory, graphic and industrial design disciplines, linguistics, social sciences, cognitive psychology, and human performance are relevant. And, of course, engineering and design methods are relevant.
--Association for Computing Machinery, Special Interest Group Computer-Human Interaction

The Iowa Board of Regents approved ISU's graduate program in Human Computer Interaction (HCI) in 2003. With more than 200 students currently enrolled, it is now the largest interdepartmental major at the university with faculty participation from all of ISU's seven colleges. The program currently offers PhD, MS and Professional Certificate degrees.

The proposed M.HCI degree will prepare professionals for successful careers at the interface between design, development, evaluation and management of technologies that enhance the productivity and creativity of people. This program will complement ISU's existing research-focused MS in HCI degree, serving as a terminal degree for practicing professionals. The program will give the students a deep knowledge of interaction technology, behavioral and social science and human-centered design to develop useful and useable technology.

❖ Academic objectives. Learning outcomes of the proposed Master of Human Computer Interaction degree are:
- Students will design, evaluate and implement interactive computing systems for human use.
- Students will analyze the major phenomena surrounding the interaction of people and technology.
- Students will employ common effective strategies for improving systems for people.

- Students will employ the necessary processes and tools to effectively manage both simple and complex projects.
- Students will incorporate user experience into design.
- Students will implement strategies for integrated interactions.
- In their coursework and subsequent professional practice, students will account for ethical issues, moral dilemmas, and stakeholder responsibilities embraced by today's corporate decision makers.

A variety of assessment strategies will be used to determine achievement of student learning outcomes, as defined by the Higher Learning Commission, the accreditation body for degree-granting post-secondary educational institutions in the North Central region. Assessment strategies will largely focus on engaging students in authentic activities relevant to what they are learning, including design, evaluation, and implementation projects, and using systematic processes such as carefully designed rubrics to evaluate the processes they employ and the products they produce.

◇   Need for proposed program. In 2008, in response to increasing demand from industry, the leaders of the HCI graduate program modified the requirements of its MS program to accommodate online students. The primary innovation was the development of an online-only "Capstone Design" course that enables students to complete a summative three-credit research project that meets the MS requirement for a creative component. The response to this online MS has been outstanding, as shown in Figure 1, below.
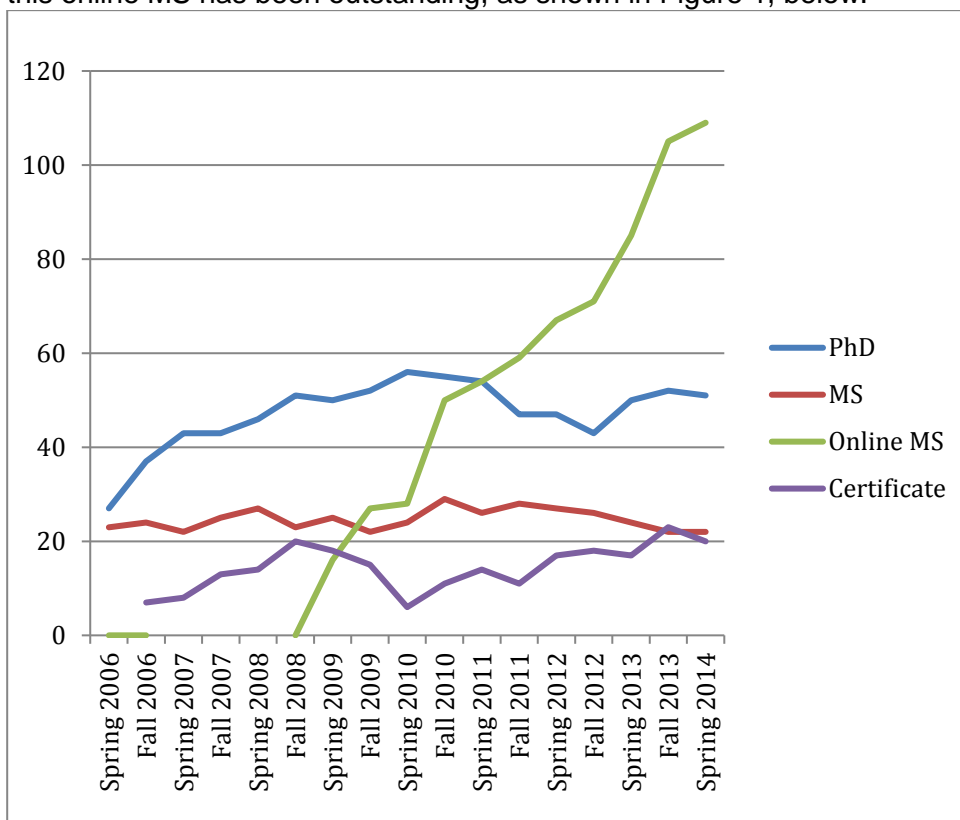

Figure 1: HCI Enrollment by degree

Figure 2, shows overall HCI program graduates per term, by degree, since the online MS was initiated. This graph clearly indicates that the online MS students are succeeding at

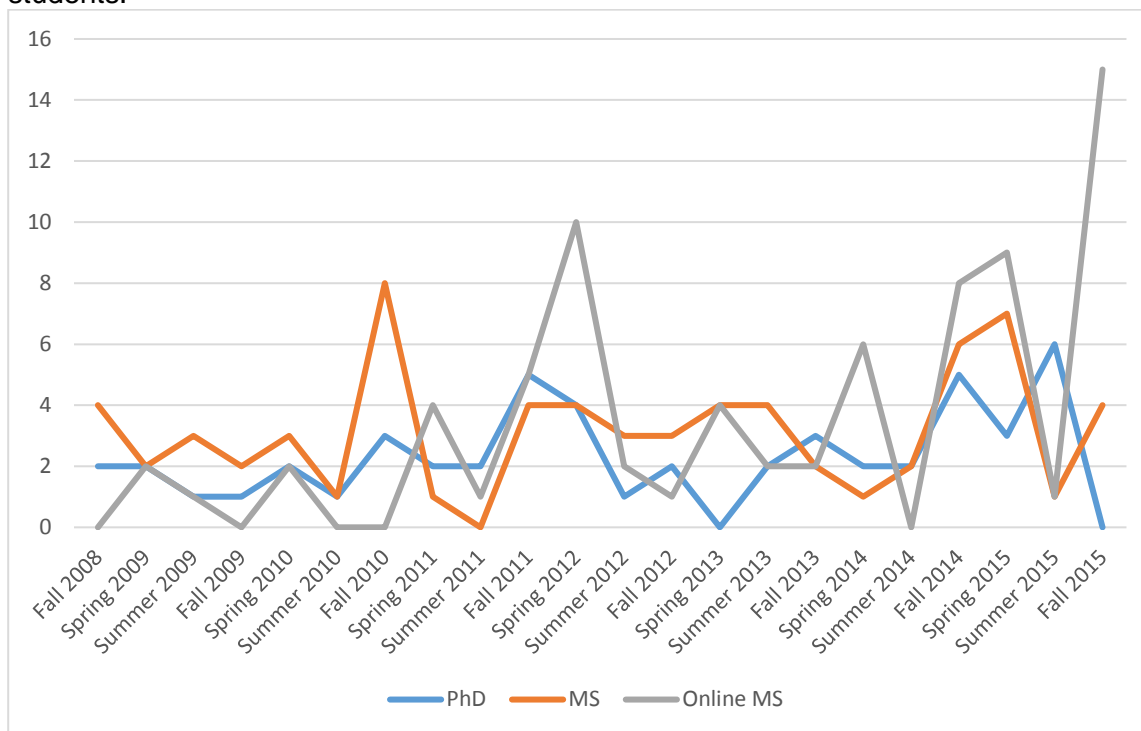completing the program, albeit over a slightly longer period of time relative to residential MS students.

Figure 2: HCI Number of Graduates per Term

Unfortunately, the growth of the online MS degree has strained the ability of the program to sustain the Capstone Design course in its current form. In addition, many of the online students are not interested in research careers, so the MS experience is a relatively poor fit. Most online HCI MS students would prefer a course-work only, professionally oriented master's degree.

The proposed M.HCI degree will provide students with a unique combination of knowledge and skill not presently offered at ISU. By providing a coursework-only curriculum, the proposed program will broaden the spectrum of the programs offered by the HCI Graduate Program, which, until now, has focused on offering advanced degrees with a research focus.

◇   Link to institutional strategic plan. By leveraging the breadth and depth of ISU disciplinary excellence, the graduate program in HCI has become an example of ISU's commitment to fostering interdisciplinary research and education. The proposed degree will allow the HCI program to extend its impact to practicing professionals, bolstering ISU's land-grant mission.

◇   Relationship to existing programs at the institution. As stated above, ISU already offers the MS in Human Computer Interaction as a research-focused graduate degree. The proposed M.HCI degree will complement the existing offering, and will provide students the desired coursework-only, professionally oriented master's degree.

We anticipate maintaining the online, research-focused MS degree. However, students new to that program will be required to find a faculty member willing to supervise an individual research project via registration for research credits (HCI 699) and completion of an MS Thesis or Creative Component. This will enable us to phase out offering the "Capstone

Design" course, HCI 598, HCI Design, Implementation and Implications. Thus, the M.HCI degree will be more efficient than the current online MS program.

◆ Relationship to existing programs at other colleges and universities. The proposed M.HCI program will be the first in Iowa to offer a coursework-only HCI program specifically tailored to meet the diverse needs of professionals working in the industry. The proposed program differs from the existing programs at Iowa State, and other programs nationwide, in that it seeks to expose HCI practitioners to a well-rounded curriculum, prepare them for the emerging challenges in HCI-related professions, and enable them to meet the expectations of this rapidly developing field.

◆ Unique features. The HCI program at Iowa State is a well-developed graduate program that is recognized nationally and internationally. Growth of the M.HCI degree will benefit from its association with the Virtual Reality Applications Center, a highly successful research center that is seeking to increase its outreach for societal and industrial needs.

◆ Resources to establish a high-quality program. The proposed program will be delivered completely online. As a result of ISU's commitment to providing quality online courses and improving online learning experience for students, the HCI Graduate Program has access to classrooms equipped with the latest instructional technologies to support, facilitate and enhance blended and hybrid courses, instructional technology support specialists who provide instructional design and support services, and technical assistance staff who support and maintain the infrastructure for the courses delivered online. Also, the HCI Graduate Program works in cooperation with the Engineering/LAS Online Learning office that has extensive experience in designing, supporting and improving online and blended courses. The courses that will constitute the curriculum for the proposed program have been offered at ISU for many years and the HCI faculty have substantial experience in designing and offering online and hybrid courses. Thus, the HCI Graduate Program, with its faculty experienced in online teaching and its state-of-the-art facilities, has adequate resources and technological infrastructure to accommodate the proposed program.

◆ Student demand. The motivation for the proposed M.HCI degree is the increasing demand for a coursework-only Master's program by professionals working in the industry who are interested in pursuing an advanced degree in HCI with a focus on practice, rather than research. Many HCI practitioners (and those that aspire to become one) work on HCI-related projects and wish to be equipped with the skills necessary to meet the expectations of their jobs. At the same time, they are reluctant to engage in the extensive research that a typical master's degree requires. The proposed M.HCI program will address the need for a coursework-only program with an emphasis on practice. Although we will continue to offer the research-focused online MS in HCI degree, we anticipate that many of the students currently enrolled in it will transfer to the M.HCI program, and that most new online students will opt for this degree as well.

◆ Duplication. Both the University of Iowa and the University of Northern Iowa offer degrees in Computer Science. However, it is believed that only the University of Iowa has faculty active in the area of Human Computer Interaction. The University of Iowa has an Informatics Bachelors of Arts program, with an emphasis in Human-Computer Interaction. However, this is an undergraduate degree program and is available only on-campus. Specifics for the program can be found at https://www.cs.uiowa.edu/undergraduate-programs/informatics-cognate-human-computerinteraction-ba. There is no comparable program at other institutions in the state of Iowa.

◈   <u>Workforce need/demand</u>. There is a national workforce need and demand for graduates with user experience (UX) design knowledge. These professionals perform research on how humans interact with technology and serve to enhance the user experience. According to MarketingHire.com[1], Interaction Designers were the fifth fastest growing job in 2013. Just this year, CNNMoney/PayScale's top 100 careers[2], ranked User Experience Designer as 14th with outstanding growth, great pay and satisfying career development. The CNN article estimates an 18%, 10-year job growth rate for User Experience Designers.

Currently, the HCI program attracts many on-line students from industry in Iowa, and many graduates of the HCI program are employed by Iowa companies such as Principal Financial, Workiva, Rockwell Collins, and Wells Fargo. We expect this demand from local industry to continue, and the proposed M.HCI program will meet that demand.

Last, it is important to note that there is a vibrant professional community in HCI and UX as evidenced by the local community group "Experiencing UX Des Moines" (see https://www.meetup.com/Experiencing-UX-DSM/), and large events are regularly sponsored by some of the potential, local employers.

◈   <u>Cost</u>. A full-time Program Coordinator currently supports the HCI graduate program. This Professional & Scientific position is funded by, and reports to, the Graduate College. No additional costs are expected due to offering the M.HCI degree.

◈   <u>Projected enrollment</u>.

	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Yr 6	Yr 7
Majors	20	40	60	80	100	110	120
Non-Majors	n/a	n/a	n/a	n/a	n/a	n/a	n/a

◈   <u>Anticipated sources of students</u>. Most M.HCI students will come from government and industry. We already have a commitment from some of these partners to provide students for the program. As described above, the online HCI MS degree began with students from industry. We expect the M.HCI program to parallel this experience.

◈   <u>Articulation agreement</u>. None are planned.

◈   <u>Off-campus delivery</u>. The proposed M.HCI degree will be offered exclusively through online/distance education. Engineering/LAS Online Learning will provide the technical support to capture and deliver these courses to students around the world.

◈   <u>Accreditation</u>. Additional HLC accreditation approval is not required.

◈   <u>Opportunities for internships</u>. There is no provision for internships for this degree. The target constituency for this degree are working professionals who will pursue the M.HCI degree part-time through online education.

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[1] http://www.marketinghire.com/20121212163/marketing-jobs-trends/study-reveals-fast-growing-creative-and-tech-jobs.html
[2] http://www.money.cnn.com/gallery/pf/2015/01/27/best-jobs-2015/14.html

◇   <u>Marketing plan</u>. Every year the leaders of the HCI graduate program attend the ACM CHI conference, the major international gathering in the field. A small portion of our core funding is dedicated to marketing all of our degree programs at this conference. We also leverage the support of our National Science Foundation-sponsored Research Experience for Undergraduates (REU) program, now in its 10th year, which brings in 10 undergraduates each summer to work with faculty and graduate students on intensive 10-week research projects. This program has been very beneficial in promoting ISU as a leader in this field, especially among under-represented minorities and women.

◇   <u>Evaluation plan</u>. The interdepartmental graduate program in HCI currently offers three degrees: PhD, MS and Professional Certificate. The performance of the entire program is evaluated annually by the Graduate College. Evaluation of the effectiveness of the proposed M.HCI degree will be incorporated into the regular annual evaluation.

◇   <u>Date of implementation</u>. The proposed program will become effective upon approval by the Board of Regents and will be included in the University's General Catalog. The anticipated implementation date is August 2017.

LETTERS OF SUPPORT

THE UNIVERSITY OF IOWA

COLLEGE OF
LIBERAL ARTS & SCIENCES

Department of Computer Science
14 MacLean Hall
Iowa City, Iowa 52242-1419
319-335-0713   *Fax* 319-335-3624
www.cs.uiowa.edu

December 21, 2015

Dear Curriculum Committee,

I am writing in support of the Masters in Human-Computer Interaction (MHCI) degree proposal drafted by Jim Oliver at Iowa State. Human-Computer Interaction is a fast-growing field that fills a critical space as computers become increasingly ubiquitous in everyone's lives and their use is often necessary to fulfill basic needs and exercise our rights in a democratic society.

As Papers Co-Chair for the 2016 edition of the most prestigious conference in Human-Computer Interaction (CHI), I am aware of the field's tremendous growth with about a 500% increase in submissions to its flagship conference in the past 15 years, and 22 specialized conferences currently sponsored by Association for Computing Machinery.

I greatly appreciate the role Iowa State has played in growing the field in our state, graduating over 100 Masters and Doctoral students since 2003. The MHCI degree seems like an appropriate next step. I hope it can continue a trend of growth for the field at all our public institutions.

Best regards,

Juan Pablo Hourcade

University of Northern Iowa

Department of Computer Science

305 Innovative Teaching & Technology Center
Cedar Falls, Iowa 50614-0507

319-273-2618
Fax: 319-273-7123

Web: www.cs.uni.edu
E-mail: dept@cs.uni.edu

January 6, 2017

James H. Oliver, Ph. D.
Director, Graduate Program in Human Computer Interaction
Howe Hall, 537 Bissell Road, Room 1620
Iowa State University
Ames, IA, USA 50011-1096

Dear Dr. Oliver,

I write on behalf of the faculty of the Department of Computer Science at UNI in support of the Masters in Human-Computer Interaction (MHCI) degree proposal you recently shred with us. Human-Computer Interaction in its many forms is an critical element of the human experience. Its importance grows as computers become ever more central to our lives, from work to play to civic engagement.

Our course in User Interface Design is one of the more popular courses among our undergraduate majors, but it also draws students from across campus who are interested in participating more fully in the design of the lived human environment. UI and UX design are among the fastest-growing careers selected by our majors, most of whom remain in Iowa after graduation. We expect that the new MHCI at Iowa State may be of interest to many of our graduates.

Our faculty greatly appreciates the role that Iowa State has has played in growing the field of HCI in our state and look forward to interacting with your new program in the future..

Sincerely,

Eugene Wallingford, PhD
Head, Department of Computer Science