Proposal for Certificate Program

Title: Graduate Certificate in Health-Assistive Smart Environment Design

Certificate Program Chair:
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1. Rationale for Certificate Program

People have always lived in places that provide shelter and basic comfort. As society and technology advance there is a growing interest in adding intelligence to our living and working environments. Expertise in machine learning, pervasive computing, and sensor networks has matured to the point where they can be integrated into a new field known as smart environments. A major societal impact of smart environments is assisting people with special health needs. To most people home is a sanctuary, yet today those who need special care often must leave home to meet medical needs. To investigate the design, usability, and testing issues for health-assistive smart environments, we need a new type of PhD researcher who is trained in the transdisciplinary areas of engineering, psychology, sociology, and health care and is poised to make scientific advances in this field that will benefit society. Today's medical program graduates are largely unaware of the assistance that technology can provide: the National Academy of Engineering and the Institute of Medicine have already recognized a need for a closer partnership between these disciplines.

Our vision is to change the culture of graduate education from the traditional isolation of topics in science and engineering to an approach that integrates the study of psychology, sociology, health care, sciences, and engineering support for individuals with special needs. The National Science Foundation has recognized the value of this program and has provided funding for an IGERT program centered on this theme. We would like to design a certificate program that will be offered to IGERT Fellows and other graduate students that complete the program components that are detailed in this proposal.

2. Target Audiences

The target audiences for this certificate program are graduate students in engineering, psychology, sociology, nursing, and the sciences; however, the certificate program is open to any individual who meets the Graduate School and the Certificate Program admission requirements and who the prerequisites for the required coursework. Students who are Fellows in the Smart Environments IGERT program are required to complete this certificate program.
3. Admission Requirements

Individuals not currently enrolled in a graduate program at WSU who wish to pursue this graduate certificate must apply on-line via the Graduate School prior to enrollment in their first course, pay a non-refundable application fee, and indicate their interest in this certificate program on the application. Information about applying for a graduate certificate can be found at http://www.gradsch.wsu.edu/future-students/admission/gradcertprogram.html. To qualify as a part-time certificate student, the applicant must:

- meet all of the admission requirements of the Graduate School (see http://www.gradsch.wsu.edu/future-students/admission/apply.html);
- submit a resume and a statement of purpose along with the on-line application; and
- meet all prerequisite course requirements or be able to demonstrate equivalent knowledge and understanding for required certificate courses prior to admission.

Current WSU graduate students who want to apply to this certificate program must:

- submit a letter of application with details of their academic and research program, as well as their proposed plan of certificate coursework to the chair of the certificate program;
- be admitted into a program in one of the areas listed in Section 2; or
- meet all prerequisite course requirements or be able to demonstrate the equivalent knowledge and understanding for the required certificate coursework.

4. Curriculum Description

In order to receive a Certificate in Health-Assistive Smart Environment Design, students must complete the following course requirements (four graded courses for a total of 12 credits). These requirements are designed to provide students with an interdisciplinary, comprehensive training program on the Certificate theme. Certificate students must maintain a 3.0 or better grade point average. Upon successful completion of the required coursework as outlined below, the certificate student must complete an Application for Graduation for a Graduate Certificate and have the chair of the certificate program approve the application before submitting it to the Graduate School.

- (CptS 582 / Psych 507) Topic: Gerontechnology I. This is a 3-credit graduate course cross-listed in the School of Electrical Engineering and Computer Science and the Department of Psychology. In the School of EECS a course needs to be taught twice before it can be added to the curriculum with its own number. At such a point that this happens the course will go through an approval process and we will change the number correspondingly in the certificate program.

In this class students will receive an introduction to the field that combines gerontology and technology. Students will learn about technologies including sensors, networks, data
collection, and data analysis methods. They will also receive an overview of the psychological issues involved in normal and abnormal aging processes. After receiving an introduction in these two areas students will then study methods of applying technologies to protect or restore autonomy, to improve the efficacy of daily activities, to protect social links, and to create a favorable environment that prevents or compensates for functional disabilities. After completion of the course each student should understand the factors involved in aging and will have a working understanding both of how studies can be conducted in smart environments to better understand the effects of aging, and also of how smart environment technologies can be harnessed to assist older adults in their homes. As part of this course, students will work in teams to design a technology solution to address a particular gerontology concern. This course will be offered every other Fall semester.

- (CptS 582 / Psych 507) Topic: Gerontechnology II. This is a 3-credit graduate course cross-listed in the School of Electrical Engineering and Computer Science and the Department of Psychology. In this class, students will receive advanced training in assessment and technology-based intervention for individuals with special cognitive and physical needs. Students will receive training on ethics and research methodology targeted toward the field of technologies for aging adults and individuals with special needs. Students will read and present papers describing research advances in the field of gerontechnology. As part of the course, students will assist staff members at nearby assisted care facilities and will implement a technology solution to address a particular gerontology concern at the assisted care facility. The teams will make regular presentations throughout the semester to detail their implementation plan, their study plan, and their study results. This special topics course will be offered every other Spring semester.

- Two graduate-level electives (for a total of 6 500-level credits) outside the student’s major department. Recommended courses are listed below but alternative courses may be proposed by the student and approved by the certificate program chair.
  - Technology Ventures (Civil Engineering)
  - Sustainability Engineering (Civil Engineering)
  - Foundations of Neuropsychology (Psychology)
  - Engineering Teaching and Learning (Engr)
  - Cognitive Psychology (Psychology)
5. Participating Faculty and Resources

Faculty and departments participating in this program are listed below.

- Diane Cook, School of Electrical Engineering and Computer Science and Chair of the Certificate Program
- Cindy Corbett, College of Nursing
- Deuk Heo, School of Electrical Engineering and Computer Science
- Lawrence Holder, School of Electrical Engineering and Computer Science
- Sankar Jayaram, School of Materials and Mechanical Engineering
- Uma Jayaram, School of Materials and Mechanical Engineering
- George LaRue, School of Electrical Engineering and Computer Science
- Maureen Schmitter-Edgecombe, Department of Psychology
- Stephen Getter, College of Pharmacy
- Behrooz Shirazi, School of Electrical Engineering and Computer Science
- Paul Whitney, Department of Psychology