

**NORTH CAROLINA STATE UNIVERSITY  
EDWARD P. FITTS DEPARTMENT  
OF INDUSTRIAL AND SYSTEMS ENGINEERING**

**ISE 601/801 SEMINAR**

**Friday, January 19, 2018**

**434 Daniels Hall**

**11:00 AM**

**Robotics Research and Applications for Occupational Safety and Health**

**Dr. Hongwei Hsiao**

**ABSTRACT**

Industrial robots have been a significant part of the workplace for decades. They include fixed and caged robots, drones, collaborative and mobile robots, and robots utilizing artificial intelligence. Recent advancements in robotics have been far more significant than in the past three decades. There are many benefits to the use of robots in the workplace, especially in performing repetitive tasks to improve productivity and reduce worker health and safety risk exposures. Robots also have been used along with workers as teams for precision tasks and rescue missions. Certain industrial sectors are increasing the use of robots, including manufacturing, healthcare, mining, and construction sectors. There are associated concerns for human worker safety and health arising from these rapid technological advances, lack of worker experience in close operations with robots and new and emerging types of robots in varied work settings, as well as the potential for unforeseen hazards and unanticipated consequences. The Census of Fatal Occupational Injuries Research Database identified 61 robot-related deaths from 1992 to 2015. Predicted rapid growth in availability and sales of robots designed to work in close cooperation with human workers and continued expansion into broader industry sectors may present new risks or intensify existing exposures for many workplaces. The National Institute for Occupational Safety and Health (NIOSH) recently established the Center for Occupational Robotics Research (CORR) to proactively address benefits and worker safety associated with increasing prevalence of robots in the workplace. This presentation will share knowledge on the changing landscape of workplaces with robotics, make suggestions for transferring robotics safety knowledge into workplace and job design practices, introduce the NIOSH CORR, and seek input on how occupational safety and health research can best serve the robotics field and how NIOSH and academia may work collaboratively in this area.

**Refreshments will be served in 428 Daniels Hall from 10:30 - 10:50 AM**

## **SPEAKER BIOGRAPHY**



**Dr. Hongwei Hsiao**

**National Institute for Occupational Safety and Health (NIOSH)**

Dr. Hongwei Hsiao serves as Chief of the Protective Technology Branch at the National Institute for Occupational Safety and Health (NIOSH). He received his degrees from Cornell University and the University of Michigan and has held engineering and management positions in both the manufacturing industry and the U.S. Government. He also has taught human factors engineering in academia. Dr. Hsiao has coordinated numerous large-scale programs and projects in the areas of safety research. He manages eight laboratories for NIOSH, including the Virtual Reality Lab, Anthropometry Research Lab, High Bay Lab, and Vehicle Safety Lab, among others. An editorial board member for eight scientific journals, he also has more than 160 publications and patents in engineering innovation for injury control. He was elected as a Fellow of the *Institute of Ergonomics and Human Factors* (UK) in 2003 and an Honorary Fellow of the *Human Factors and Ergonomics Society* (US) in 2005. He also was credentialed as a Senior Biomedical Research Service Fellow (SBRS) and was named Distinguished Consultant by the Government Executive Resources Board in 2003. Aside from his Branch Chief duties, Dr. Hsiao serves as Coordinator for the newly established NIOSH Center for Occupational Robotics Research to develop strategic goals for the center, administer partnerships with trade associations and robotics manufacturers, and coordinate center resources, seminars, and training.