DCSC
Delft Center for Systems and Control

TU Delft

HRI
Honda Research Institute EU

The Delft Center for Systems and Control at Delft University of Technology, The Netherlands, in collaboration with the Honda Research Institute Europe, Offenbach am Main, Germany, announces vacancies for

Two PhD Students:
Learning Physical Human-Robot Cooperation Tasks

Groups

The Delft Center for Systems and Control (DCSC) www.dcsc.tudelft.nl covers modeling, identification, control and optimization of complex dynamic systems. We develop tools for the analysis, synthesis and real-time implementation of advanced control systems in robotics, mechatronics, adaptive optics, traffic and transportation systems. DCSC is currently composed of 14 academic staff who supervise around 40 PhD students and more than 100 MSc students. DCSC is responsible for an international MSc program in Systems and Control, and participates in the BSc and MSc programs in mechanical engineering, electrical engineering and applied physics. The group actively participates in the Dutch graduate school DISC (Dutch Institute of Systems and Control). The Center is located within the Faculty of Mechanical, Maritime and Materials Engineering (3mE) of Delft University of Technology (TUD), and has extensive laboratory facilities. It has a leading role in the TU Delft Robotics Institute robotics.tudelft.nl and participates in the RoboNED platform, which have both been established to facilitate the collaboration in the area of robotics. DCSC maintains cooperative research contacts with many industrial partners.
The vision of the Honda Research Institutes (HRI) is to contribute to society's future by pursuing emerging technologies of the 21st century. Honda is the largest engine manufacturer in the world - HRI is proud to be part of the engines of innovation behind the "Power of Dreams". The three Honda Research Institutes in Japan, in the United States and in Europe collaborate closely with their respective local scientific communities. Each contributes its specific expertise to the Honda science-technology-science circle reflecting their determination to break the traditional chain of innovation and to realize new structures for new challenges. Research in Intelligent Systems is at the center of the Honda Research Institute Europe (HRI-EU) www.honda-ri.de. Intelligent systems will shape our future in a variety of forms, ranging from accident-free mobility to cognitive robotics and from smart process management to the efficient use of resources. Intelligence is necessary to handle complexity in products and in processes.

Job description

This project focuses on "dexterous cooperation", i.e., a robot and a human co-worker jointly transporting and/or assembling objects (e.g., stacking boxes, changing a tire). The scientific challenges range from communicating intentions (e.g., on the robot side via force guidance or speech and via touch or gestures on the human side), learning to anticipate human behaviors and extracting movement goals, to actually learning how to best physically collaborate with the human. We will consider both high-level interactions (e.g., steps in the overall plan) as well as low-level interactions (e.g., ensuring stability while transporting an object). Applicable techniques include reinforcement learning, imitation learning, interactive learning, model learning, incorporating prior knowledge, scene understanding and prediction, planning, movement primitives, hybrid force-position control, etc. The exact research topic can be adapted to the applicant's background and interests.

Requirements

The candidate has an MSc degree in systems and control, mechanical engineering, applied mathematics, artificial intelligence, machine learning, electrical engineering, computer science, or a related field. The candidate must have strong analytical skills and must be able to work at the intersection of several research domains. A very good command of the English language is required, as well as excellent communication skills. Candidates having exhibited their ability to perform research in robotics and/or machine learning are especially encouraged to apply.

Position

The positions will start June to October 2017, and run for four years. The successful candidates will be enrolled in the university's graduate school www.graduateschool.tudelft.nl as well as the HRI European Graduate Network. TU Delft offers an attractive benefits package, including a flexible work week and the option of assembling a customized compensation and benefits package (the 'IKA'). Salary and benefits are in accordance with the Collective Labor Agreement for Dutch Universities (starting salary 2.191 EUR/month). One of the PhD students will be based at TU Delft (The Netherlands) the other student will be based at the Honda Research Institute Europe (Offenbach am Main, Germany). The students work as a team, will be supervised jointly by HRI-EU and TUD, and will visit the respective other location for extended research stays.

Information and application

More information on this position can be obtained from Dr. Jens Kober j.kober@tudelft.nl. The application deadline is April 30th 2017. Interested applicants should send a cover letter, a detailed resume, names and addresses of two professional references, BSc and MSc transcripts, a motivation letter stating why the proposed research topic interests them and which location they are applying for (TU Delft and/or HRI-EU), a summary of their MSc thesis (as well as a PDF of their thesis if it has already been completed), possibly PDFs of publications, and any other information that might be relevant for their application to j.kober@tudelft.nl.