The Delft Center for Systems and Control and TU Delft Robotics Institute at Delft University of Technology, the Netherlands, announce a vacancy for one PhD student within the project: Deep Learning for Robust Robot Control

Project description
While robots can flawlessly execute a set of commands to achieve a task, these commands are mostly encoded by hand. There is a need for effective learning methods that can deal with the uncertainty in the robot's environment, in particular when only broad goals are specified, and the learning algorithm has to learn motor commands to achieve these goals. This typically involves reinforcement learning (RL). However, current RL for robotics tasks relies on ad hoc function approximators and is typically not robust to changes in the task, environment, or robot uncertainty (compliant robot actuators, or wear and tear). The aim of this project is to integrate two emerging notions in order to make reinforcement learning for robot control more robust and efficient: dynamic feedback control policies for robust control combined with deep neural networks to learn low-dimensional parameterizations of such control policies. This approach promises a generic and robust approach to reinforcement learning for robotic control. The project is funded by Natural Artificial Intelligence program of the Netherlands Organization for Scientific Research (NWO) and it is a collaboration project between Delft University of Technology and Center for Mathematics and Computer Science (CWI) in Amsterdam. The supervisors and promoters are professors Robert Babuska and Karl Tuyls (TU Delft) and dr. Sander Bohte (CWI) is an advisor to the project.

What do we ask?
We are looking for a candidate with an MSc degree in systems and control, applied mathematics, artificial intelligence or machine learning, as well as a strong interest in robotics. Additional experience in the use of deep learning neural networks and/or robotics is an asset. The candidate must have strong analytical skills and must be able to work at the intersection of several research domains (control, machine learning, robotics). A very good command of the English language is required, as well as excellent communication skills.

What do we offer?
We offer the opportunity to do scientifically challenging research in a multi-disciplinary research group. The appointment will be for a period of 4 years. As an employee of the university you will receive a competitive salary (between approx. EUR 2000 and EUR 2600 gross per month based on a full-time appointment), as well as excellent secondary benefits in accordance with the Collective Agreement (CAO) of the Association of Universities in the Netherlands (VSNU). Assistance with accommodation can be arranged.

How to apply?
Submit your application to Prof. Robert Babuska and Prof. Karl Tuyls (email: r.babuska@tudelft.nl, k.p.tuyls@tudelft.nl) before November 30th 2014. Include a cover letter along with a detailed curriculum vitae, a separate motivation letter stating why the proposed research topic interests you, electronic copies of publications (if applicable), the summary of your MSc thesis, your MSc and BSc course programs and the corresponding grades, names and addresses of two to three reference persons, and other information that might be relevant to your application. The project is expected to start on January 1st 2015.