The Department of Automatic Control & Systems Engineering
is pleased to announce the following seminar:

Gaussian processes to model magnetic fields and for probabilistic line searches

Dr Manon Kok
Research Associate in Machine Learning, Computational and Biological Learning Lab
University of Cambridge, UK

Thursday, 23 November 2017 at 13:00
LT02, Sir Henry Stephenson Building

Abstract

This talk will consist of two separate parts, both using Gaussian process models but for two very different applications.

The first half of the talk will focus on the topic of indoor navigation using the magnetic field as a source of position information. To this end, we build a map of the indoor magnetic field which can subsequently be used for localization. We model the magnetic field components jointly and incorporate prior information from Maxwell's equations in the Gaussian process prior.

In the second half of the talk Dr Kok will discuss her ongoing work about probabilistic line searches. This work is motivated by the fact that we are interested in optimising very high-dimensional, nonlinear, badly conditioned functions. For these kinds of problems, standard optimisation algorithms do not always converge to a local minimum. The reason for this is that line search algorithms are based on comparison of two function evaluations which can be inaccurate due to finite numerical precision. To remedy this, we propose a probabilistic line search algorithm in which we build a fully probabilistic model of the function using all available information and sensible prior assumptions.

Biography

Manon Kok is currently a Postdoc in the Machine Learning Group of the Computational and Biological Learning Lab at the University of Cambridge. In January 2017 she received her PhD degree in Automatic Control from Linkoping University, Sweden. She received M.Sc. degrees in Applied Physics and in Philosophy of Science, Technology and Society (2009 and 2007, respectively), both from the University of Twente, the Netherlands. From 2009 until 2011 she worked as a Research Engineer at Xsens Technologies. In April 2018 she will start as Assistant Professor at the Delft University of Technology, the Netherlands.

Her research interests are in the fields of probabilistic inference for sensor fusion, signal processing and machine learning. One of the applications that she is specifically interested in is position and orientation estimation using inertial sensors and magnetometers.

Light refreshments will be served in the foyer of
the Sir Henry Stephenson Building