

MAGDEBURG LECTURES ON OPTIMIZATION AND CONTROL

Jan Maciejowski



Fault-tolerant control using Gaussian processes and model predictive control

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Time & Place

The presentation on January 27, 2015 will be given in the Senatssaal (building 05, room 205) and starts at 5.00 p.m.

Abstract

Essential ingredients for fault-tolerant control are the ability to represent system behaviour following the occurrence of a fault, and the ability to exploit this representation for deciding control actions. Gaussian processes seem to be very promising candidates for the first of these, and model predictive control has a proven capability for the second. We therefore propose to use the two together to obtain fault-tolerant control functionality. Our proposal is illustrated by several reasonably realistic examples drawn from flight control. Some remarks will be made about the use of a Bayesian framework for studying fault-tolerant control.

Short CV

Jan Maciejowski graduated from ›Sussex University (<http://www.susx.ac.uk/>) in 1971 with a B.Sc degree in Automatic Control, and from ›Cambridge University (<http://www.cam.ac.uk/>) in 1978 with a Ph.D degree in Control Engineering. From 1971 to 1974 he was a Systems Engineer with Marconi Space and Defence Systems Ltd, working mostly on attitude control of spacecraft and high-altitude balloon platforms.

He is a Professor of Control Engineering and a member of the Control Group. He is also the President and a Fellow of ›Pembroke College, Cambridge (<http://www.pem.cam.ac.uk/>). From 2009 to 2014 he was the Head of the ›Information Engineering Division (<http://www.eng.cam.ac.uk/research/div-f/divhomeF.shtml>). He was the President of the ›European Union Control Association (<http://www.esi.us.es/euca>) from 2003 to 2005, and was President of the ›Institute of Measurement and Control (<http://www.instmc.org/>) for 2002. He is a Chartered Engineer and a Fellow of the ›Institution of Engineering and Technology (<http://www.iet.org.uk/>) (IET), the ›Institute of Electrical and Electronic Engineers (<http://www.ieee.org/>) (IEEE), the ›Institute of Measurement and Control (InstMC) (<http://www.instmc.org/>), and of the ›International Federation of Automatic Control (IFAC) (<http://www.ifac-control.org/>). He was a ›Distinguished Lecturer (<http://www.ieeecss.org/MAB/MABprograms/lecture.html>) of the IEEE Control Systems Society from 2001 to 2007. He was a member of the IET's Policy Panel for Innovation and Emerging Technologies until 2011.