

MINI-COURSE ON NONLINEAR SYSTEM IDENTIFICATION

EINDHOVEN, THE NETHERLANDS, APRIL 14-17, 2020

PROGRAM

TUESDAY 14/04/2020

09.00 – 09.30	Registration	
09.30 – 09.45	Welcome	J.-P. Noël
09.45 – 10.45	An Introduction to Nonlinear System Identification – part 1	J. Schoukens
10.45 – 11.15	Coffee	
11.15 – 12.00	An Introduction to Nonlinear System Identification – part 2	J. Schoukens
12.00 – 13.00	Lunch	
13.00 – 15.00	An Introduction to Nonlinear System Identification – part 3	J. Schoukens
15.00 – 15.30	Coffee	
15.30 – 17.00	Hands-on: Multisines	M. Schoukens
17.00 – ...	Welcome Drink and Snacks	Hubble Café – TU/e Campus

WEDNESDAY 15/04/2020

09.00 – 10.30	Nonlinear Detection with Sine Sweeps and Multisines	J.-P. Noël
10.30 – 11.00	Coffee	
11.00 – 12.00	Hands on: Nonlinear Detection with Sine Sweeps and Multisines	M. Schoukens
12.00 – 13.00	Lunch	
13.00 – 14.00	Best Linear Approximation	K. Tiels
14.00 – 15.30	Hands-on: Best Linear Approximation	K. Tiels
15.30 – 16.00	Coffee	
16.00 – 17.00	Networked Best Linear Approximation	M. Schoukens & J.-P. Noël

THURSDAY 16/04/2020

09.00 – 09.30	Nonlinear Model Structures – overview / recap	M. Schoukens
09.30 – 10.30	Block-Oriented Identification	M. Schoukens & K. Tiels
10.30 – 11.00	Coffee	
11.00 – 12.00	Block-Oriented Identification	M. Schoukens & K. Tiels
12.00 – 13.00	Lunch	
13.00 – 15.00	Nonlinear State Space Identification	J.-P. Noël & K. Tiels
15.00 – 15.30	Coffee	
15.30 – 17.00	Hands-on: Block-Oriented and Nonlinear State Space Identification	M. Schoukens, J.-P. Noël & K. Tiels

FRIDAY 17/04/2020

09.00 – 09.15	Introduction	
09.15 – 10.30	Artificial Neural Networks	M. Schoukens
10.30 – 11.00	Coffee	
11.00 – 12.00	Artificial Neural Networks	M. Schoukens
12.00 – 13.00	Lunch	
13.00 – 15.00	An Introduction to Bayesian versus Maximum Likelihood Estimation	K. Tiels
15.00 – 15.30	Coffee	
15.30 – 16.30	Analysis	J.-P. Noël
16.30 – 17.00	Closing	

Lecturers

Dr. Jean-Philippe Noël received a PhD degree in engineering sciences in 2014 from the University of Liège (ULiège), Belgium. From 2014 to 2018, he was a post-doctoral researcher at ULiège and the Vrije Universiteit Brussel, Belgium, and he was also a visiting researcher at Duke University, NC, USA, in 2015 and at the Eindhoven University of Technology, Netherlands, in 2017. Currently, he is a senior Research Fellow with the Control Systems Technology Group at the Eindhoven University of Technology, Netherlands. He is also an invited Assistant Professor with the Aerospace and Mechanical Engineering Department in Liège. Jean-Philippe is member of the Editorial Board of the 'Mechanical Systems and Signal Processing' journal, and a co-founder of NOLISYS, a start-up company active in the field of nonlinear vibrations.

His interests lie in modelling of nonlinear dynamic systems using data-driven approaches, with research activities ranging from data measurement to model-based system and control design.

Prof. Johan Schoukens received the Master's degree in electrical engineering in 1980, and the PhD degree in engineering sciences in 1985 from the Vrije Universiteit Brussel (VUB), Brussels, Belgium. In 1991 he received the degree of Geaggregeerde voor het Hoger Onderwijs from the VUB, and in 2014 the degree of Doctor of Science from The University of Warwick.

From 1981 to 2000, he was a researcher of the Belgian National Fund for Scientific Research (FWO-Vlaanderen), was full time professor in electrical engineering at the VUB till 2018. Since 2018 he is emeritus professor at the INDI department of the VUB and member of the Department of Electrical Engineering, Eindhoven University of Technology. From 2009 to 2016, he was visiting professor at the department of Computer Sciences of the Katholieke Universiteit Leuven. He has been a Fellow of IEEE since 1997. He was the recipient of the 2002 Andrew R. Chi Best Paper Award of the IEEE Transactions on Instrumentation and Measurement, the 2002 Society Distinguished Service Award from the IEEE Instrumentation and Measurement Society, and the 2007 Belgian Francqui Chair at the Université Libre de Bruxelles (Belgium). Since 2010, he is a member of the Royal Flemish Academy of Belgium for Sciences and the Arts. In 2011 he received a Doctor Honoris Causa degree from the Budapest University of Technology and Economics (Hungary). Since 2013, he is an honorary professor of the University of Warwick.

His main research interests include system identification, signal processing, and measurement techniques.

Dr. Maarten Schoukens is an Assistant Professor in the Control Systems (CS) Group at the Department of Electrical Engineering, Eindhoven University of Technology. He received the master's degree in electrical engineering and the Ph.D. degree in engineering from the Vrije Universiteit Brussel (VUB), Brussels, Belgium, in 2010 and 2015 respectively. From 2015 to 2017, he has been a Post-Doctoral Researcher with the ELEC Department, VUB. In October 2017 he joined the Control Systems research group, TU/e, Eindhoven, The Netherlands, since 2018 he is an Assistant Professor in the same group. Maarten was awarded an FWO Ph.D. Fellowship in 2011, and an EU - Marie Skłodowska-Curie Individual Fellowship in 2018.

His main research interests include the measurement and data-driven modelling and control of nonlinear dynamical and linear parameter-varying systems using system identification and machine learning techniques.

Dr. Koen Tiels received the degree of master in Electromechanical Engineering in July 2010 and the degree of Doctor in Engineering (Ph.D.) in March 2015, both from the Vrije Universiteit Brussel (VUB), Brussels, Belgium. He was a post-doctoral researcher in the period 2015-2018 at the same university. From February 2018 until January 2020, he joined the Department of Information Technology, Division of Systems and Control at Uppsala University, as a post-doctoral researcher. Since February 2020, Koen is an Assistant Professor within the Control Systems Technology (CST) Group, Department of Mechanical Engineering at the Eindhoven University of Technology. Koen Tiels is the main developer of the PNLSS 1.0 Toolbox.

His main interests are in the field of nonlinear system identification and Bayesian estimation.