

Prof. Dr. Ir. Joannes Schoukens: 65 !

Laudatio by prof. dr. ir. Bart De Moor

Eindhoven, April 20 2023


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Johan Schoukens

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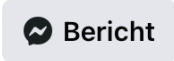
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 Bericht

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Johan Schoukens
267 vrienden

 Toevoegen als vriend  Bericht

Generative AI ?



Intro

- Heeft gewerkt als treinbegeleider bij NMBS
- Ging naar Sint-Maarteninstituut
- Ging naar HORIHAN Aalst
- Woont in Oostende, West-Vlaanderen, Belgium
- Afkomstig van Aalst

- Reizen
- Wandelen
- Fietsen
- Films kijken
- Naar muziek luisteren

Foto's

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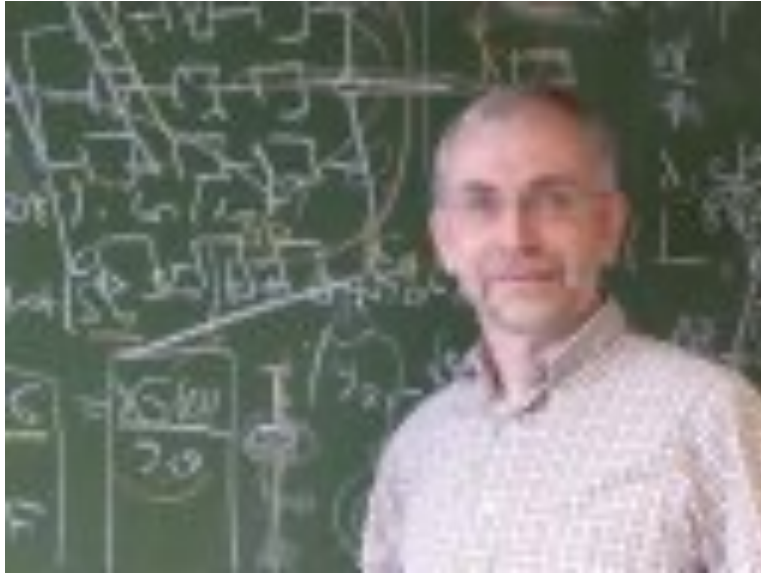
Berichten

Filters



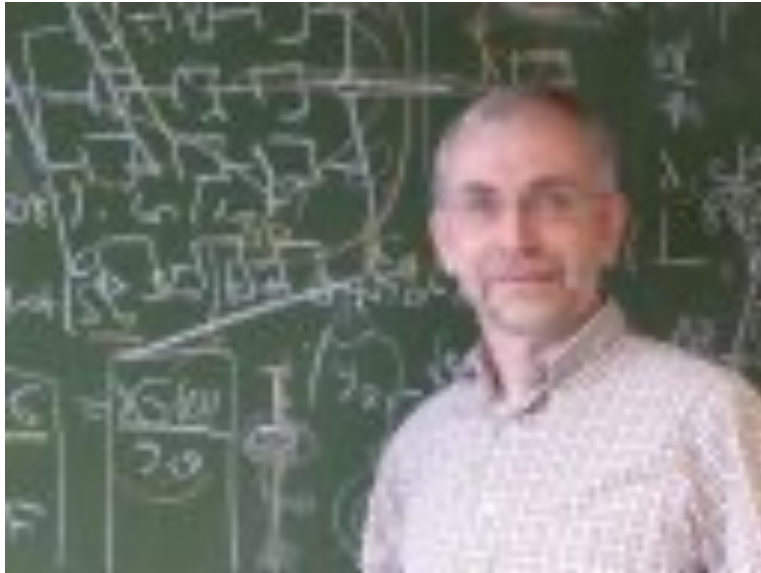
Johan Schoukens heeft zijn profielfoto gewijzigd.
13 maart ·





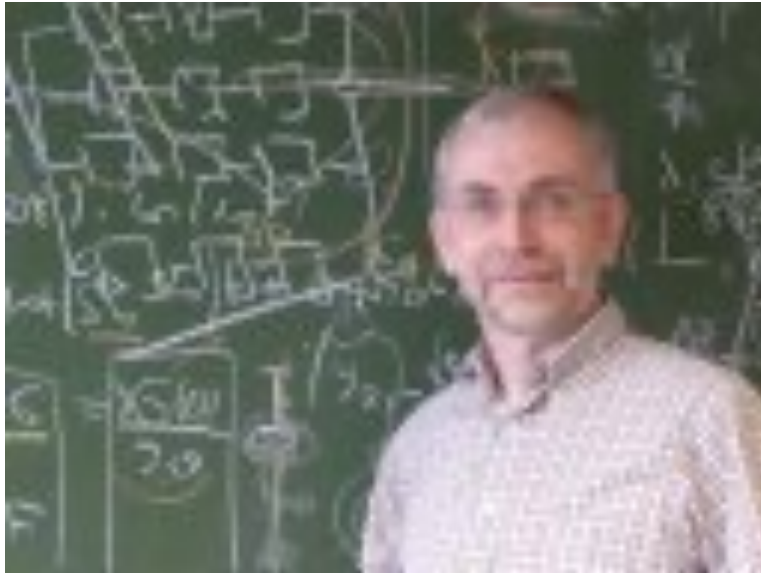
Joannes Schoukens (1958 - ...)

Johan Schoukens (Fellow, IEEE) received the master's degree in electrical engineering, the Ph.D. degree in engineering sciences, and the degree of Geaggregeerde voor het Hoger Onderwijs from Vrije Universiteit Brussel (VUB), Brussels, Belgium, in 1980, 1985, and 1991, respectively, the Doctor Honoris Causa degree from the Budapest University of Technology and Economics, Budapest, Hungary, in 2011, and the D.Sc. degree from the University of Warwick, Coventry, U.K., in 2014. From 1981 to 2000, he was a Researcher with the Belgian National Fund for Scientific Research (FWO-Vlaanderen), Brussels, Belgium. He was a full-time Professor in electrical engineering at the VUB until 2018. Since 2018, he has been an Emeritus Professor at the Department Industrial Engineering (INDI), VUB, and a member of the Department of Electrical Engineering, Eindhoven University of Technology, Eindhoven, The Netherlands. From 2009 to 2016, he was a Visiting Professor at the Department of Computer Science, Katholieke Universiteit Leuven, Leuven, Belgium. Since 2013, he has been an Honorary Professor with the University of Warwick. His main research interests include system identification, signal processing, and measurement techniques. Dr. Schoukens was a recipient of the Andrew R. Chi Best Paper Award of the IEEE Transactions on Instrumentation and Measurement in 2002, the Society Distinguished Service Award from the IEEE Instrumentation and Measurement Society in 2002, and the Belgian Francqui Chair at the Université Libre de Bruxelles, Belgium, in 2007. Since 2010, he has been a member of the Royal Flemish Academy of Belgium for Sciences and the Arts. In 2020, he received the Gold Medal for recognition as the Most Published Author of All Time in the IEEE Transactions on Instrumentation and Measurement from the IEEE Instrumentation and Measurement Society.



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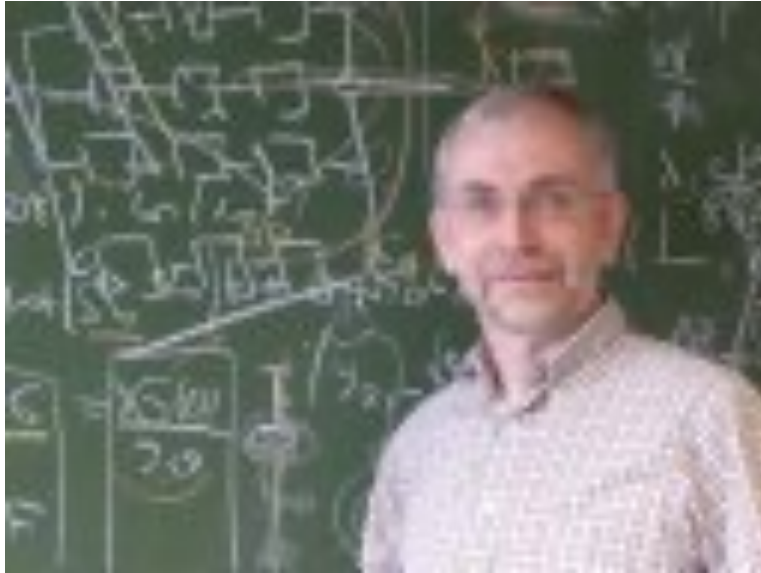
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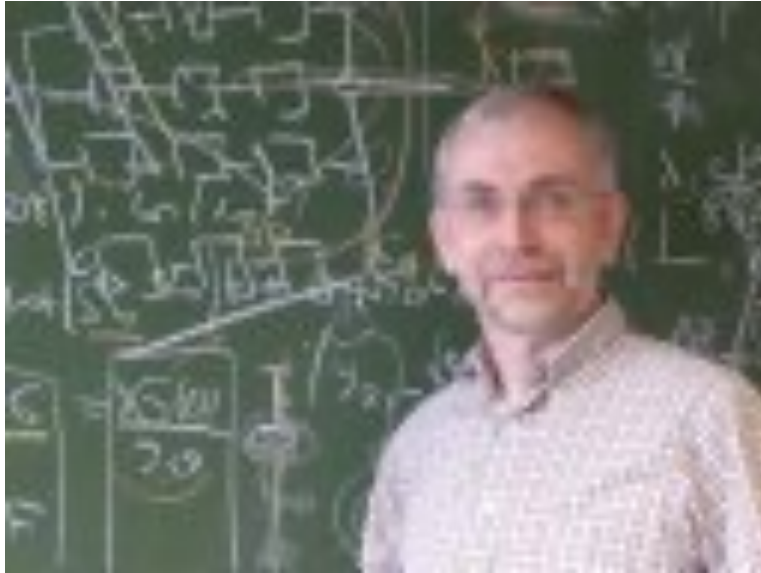
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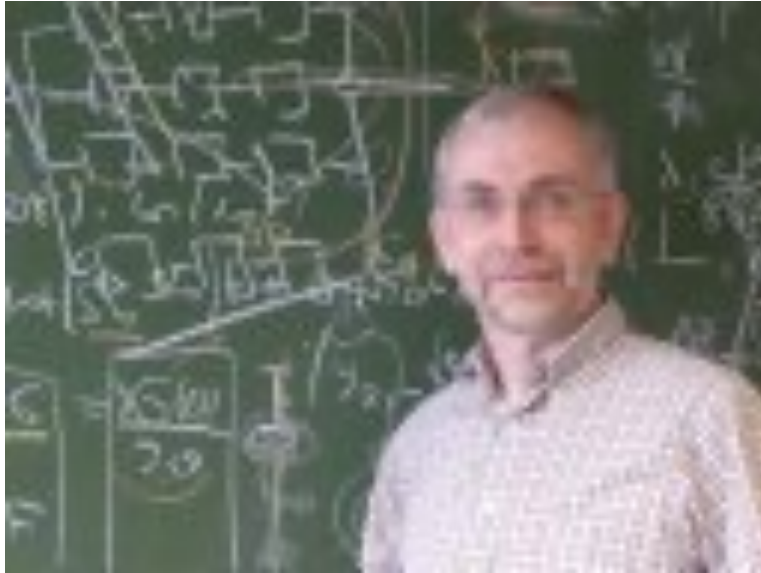
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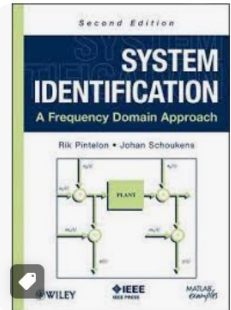
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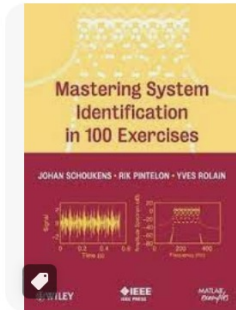
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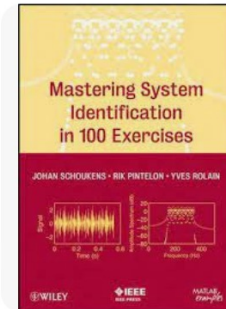
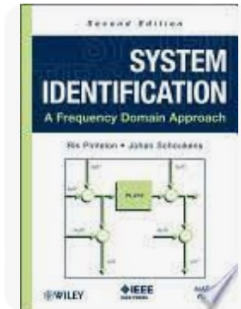
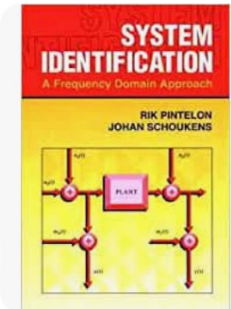
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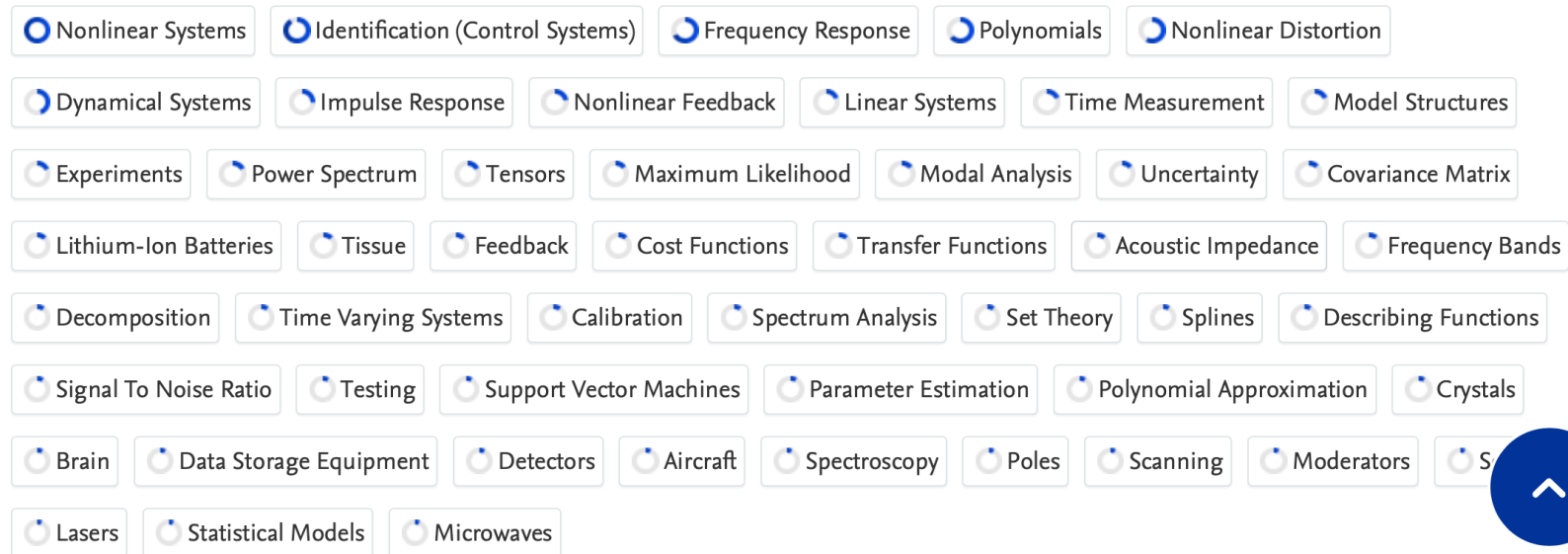


Fingerprint

Dive into the research topics where Joannes Schoukens is active. These topic labels come from the works of this person. Together they form a unique fingerprint.

Sort by | **Weight** | [Alphabetically](#)

Engineering & Materials Science



Nonlinear Systems Identification (Control Systems) Frequency Response Polynomials Nonlinear Distortion

Dynamical Systems Impulse Response Nonlinear Feedback Linear Systems Time Measurement Model Structures

Experiments Power Spectrum Tensors Maximum Likelihood Modal Analysis Uncertainty Covariance Matrix

Lithium-Ion Batteries Tissue Feedback Cost Functions Transfer Functions Acoustic Impedance Frequency Bands

Decomposition Time Varying Systems Calibration Spectrum Analysis Set Theory Splines Describing Functions

Signal To Noise Ratio Testing Support Vector Machines Parameter Estimation Polynomial Approximation Crystals

Brain Data Storage Equipment Detectors Aircraft Spectroscopy Poles Scanning Moderators S

Lasers Statistical Models Microwaves



Mathematics

- Linear Approximation
- Best Approximation
- Nonlinear Model
- Decoupling
- Hammerstein Model
- Wiener Model
- Frequency Response Function
- Nonlinear Systems
- State-Space Model
- Modeling
- Excitation
- Model
- Frequency Response
- Estimate
- Nonlinear System Identification
- Multivariate Polynomials
- Tensor Decomposition
- System Identification
- Output
- Power Spectrum
- Broadband
- Impedance
- Impulse Response
- Linear Systems
- Polynomial
- Regularization
- Transfer Function
- Local Polynomial
- Linear Time
- Branch

Physics & Astronomy

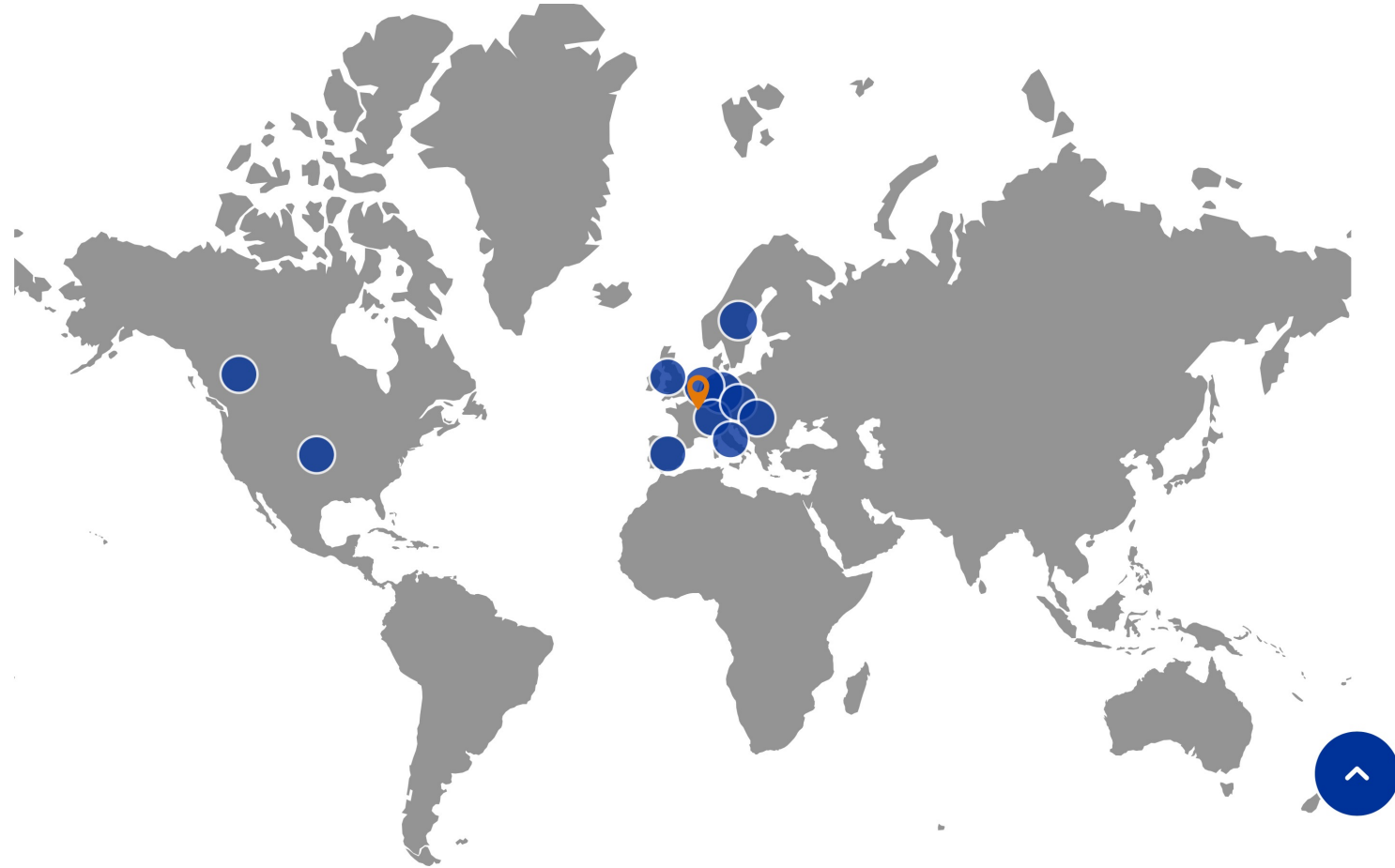
- Frequency Response
- Estimators
- Nonlinear Systems
- Excitation
- System Identification
- Approximation
- Estimates
- Output
- Polynomials
- Nonlinearity
- Analyzers
- Leakage
- Power Spectra
- Digital To Analog Converters



Johan's Footprint



Johan's Footprint



Projects



1 62
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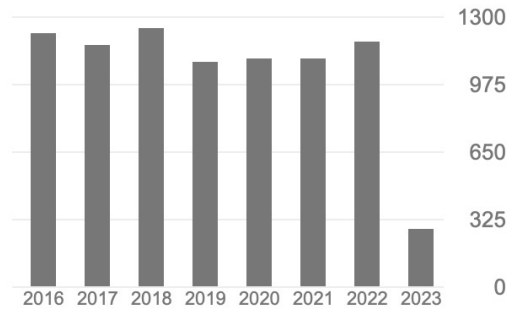
[System Identification](#) [data driven modelling](#) [nonlinear systems](#)

| TITLE | CITED BY | YEAR |
|--|----------|------|
| System identification: a frequency domain approach R Pintelon, J Schoukens John Wiley & Sons | 3512 | 2012 |
| Identification of linear systems: a practical guideline to accurate modeling J Schoukens, R Pintelon Elsevier | 691 | 2014 |
| Parametric identification of transfer functions in the frequency domain-a survey R Pintelon, P Guillaume, Y Rolain, J Schoukens, H Van Hamme IEEE transactions on automatic control 39 (11), 2245-2260 | 659 | 1994 |
| The interpolated fast Fourier transform: A comparative study J Schoukens, R Pintelon, H Van Hamme IEEE Transactions on instrumentation and measurement 41 (2), 226-232 | 370 | 1992 |
| Nonlinear system identification: A user-oriented road map J Schoukens, L Ljung IEEE Control Systems Magazine 39 (6), 28-99 | 333 | 2019 |
| Identification of nonlinear systems using polynomial nonlinear state space models J Paduart, L Lauwers, J Swevers, K Smolders, J Schoukens, R Pintelon Automatica 46 (4), 647-656 | 309 | 2010 |
| Crest-factor minimization using nonlinear Chebyshev approximation methods | 297 | 1991 |

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Zoek expertise

(583662)
Publicaties(2579)
Octrooien(175)
Infrastructuur(938)
Datasets

Onderzoeker

Johan Schoukens

KU LEUVEN

Disciplines: Toegepaste wiskunde, Computerarchitectuur en -netwerken, Informatiewetenschappen, Informatiesystemen, Programmeertalen, Scientific computing, Theoretische informatica, Visual computing, Andere informatie- en computerwetenschappen, Modellering, Biologische systeemtechnologie, Signaalverwerking, Controlsystemen, robotica en automatisatie, Ontwerptheorieën en -methoden, Mechatronica en robotica, Computertheorie

AFFILIATIES

- [Dynamische Systemen, Signaalverwerking en Gegevensanalyse \(STADIUS\)](#) (Afdeling)
Lid
Vanaf 1 aug 2020 → 30 sep 2016
[KU Leuven](#)
- [Afdeling ESAT - STADIUS, Stadius Centrum voor Dynamische Systemen, Signaalverwerking en Gegevensanalyse](#) (Afdeling)
Lid
Vanaf 19 nov 2007 → 30 sep 2016
[KU Leuven](#)
- [Departement Elektrotechniek \(ESAT\)](#) (Departement)
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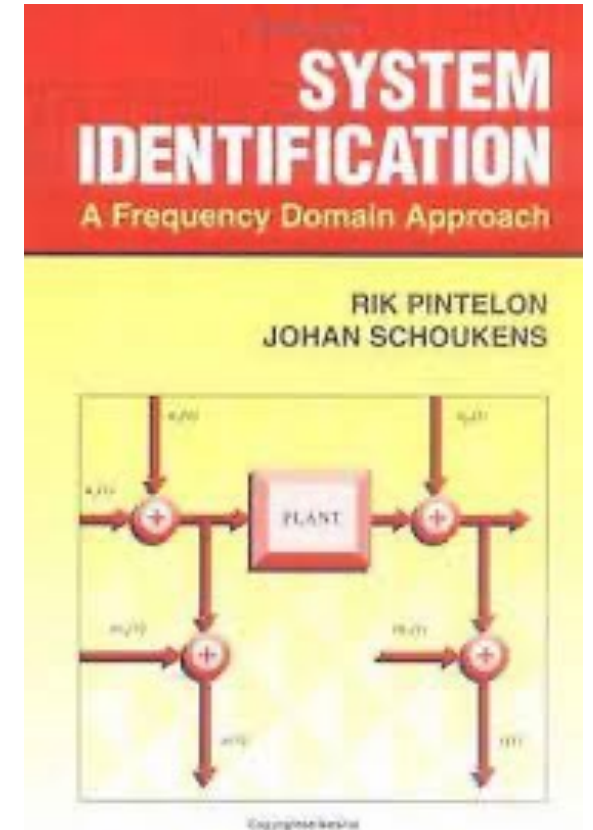
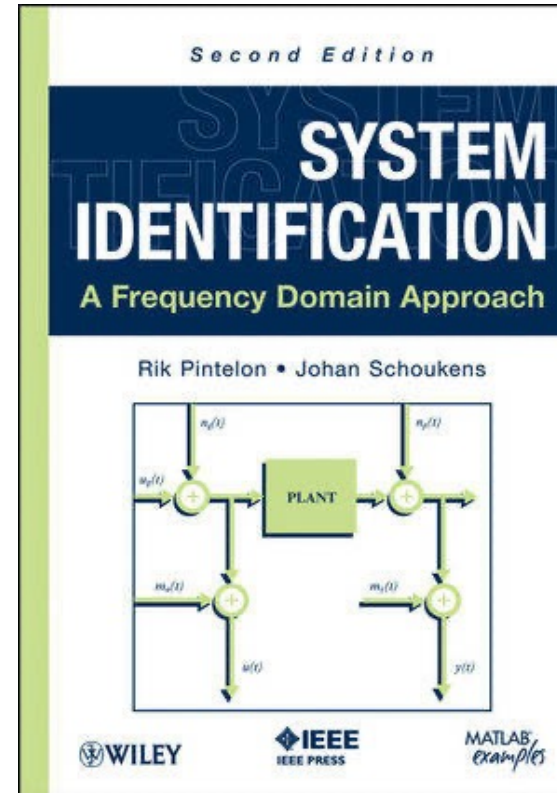
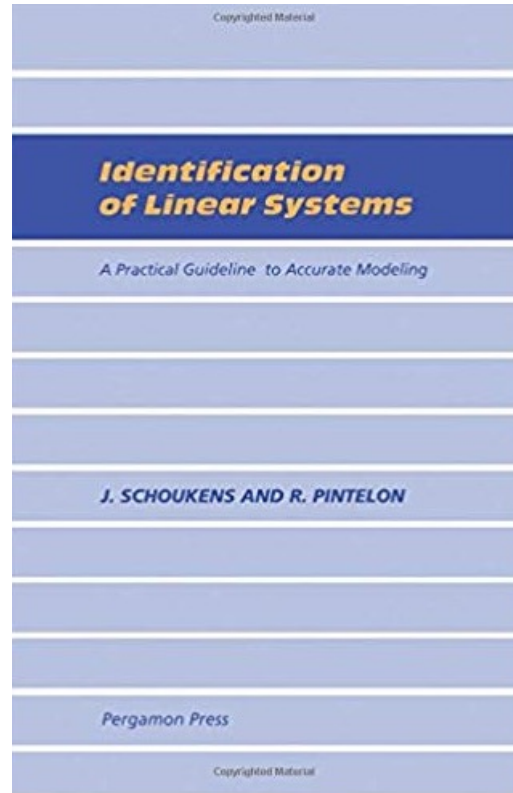
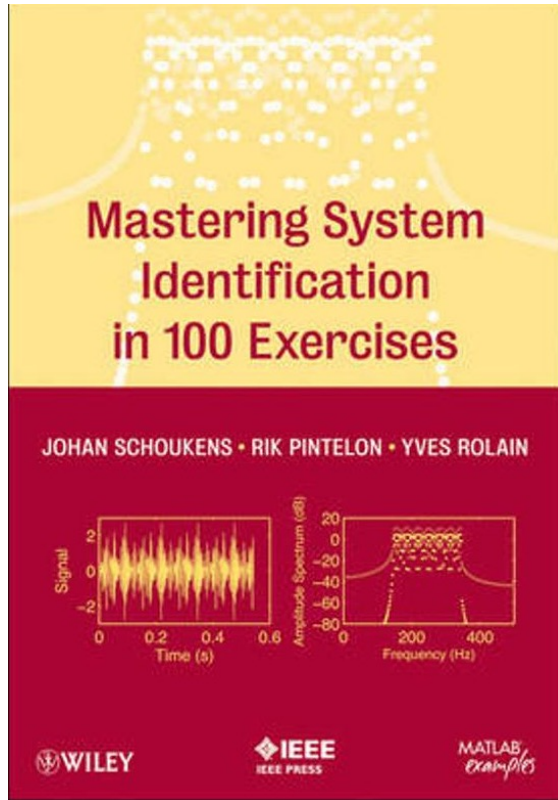
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CONTACT

Belgium

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From a report of 1993

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 Univ. de Liège (Prof. M. G\'eradin), VUB (Prof. J. Schoukens),
 Univ. Antwerpen RUCA (Prof. D. Van Dyck).

Structured Nonlinear System Identification Using Kernel-based Methods

Supervisor:
Prof. dr. ir. J.A.K. Suykens

Co-Supervisor:
Prof. dr. ir. J. Schoukens
(Vrije Universiteit Brussel)

Ricardo Castro-Garcia

Dissertation presented in partial
fulfillment of the requirements for the
degree of Doctor of Engineering
Science (PhD): Electrical Engineering

October 2017

Nonlinear System Identification using Structured Kernel Based Models

Tillmann Falck

Jury:

Prof. Dr. Yves Willems, chairman
Prof. Dr. Johan A.K. Suykens, promotor
Prof. Dr. Bart De Moor, co-promotor
Prof. Dr. Joos Vandewalle
Prof. Dr. Moritz Diehl
Prof. Dr. Joris De Schutter
Prof. Dr. Johan Schoukens
(Vrije Universiteit Brussel)
Dr. Kristiaan Pelckmans
(Uppsala University)

Dissertation presented in
partial fulfillment of the
requirements for the degree of
Doctor in Engineering

April 2013



KU LEUVEN
Faculty of Engineering Science
Department of Electrical Engineering
STADIUS
Kasteelpark Arenberg 10, B-3001 Leuven, Belgium

A Numerical Linear Algebra Framework for Solving Problems with Multivariate Polynomials

Kim Batselier

Jury:

Prof. dr. ir. Hendrik Van Brussel, chairman
Prof. dr. ir. B. De Moor, promotor
Prof. dr. ir. J.A.K. Suykens
Prof. dr. ir. J. Vandewalle
Prof. dr. ir. K. Meerbergen
Prof. dr. ir. J. Schoukens
(Vrije Universiteit Brussel)
Prof. dr. B. Hanzon
(University College Cork)

Dissertation presented
in partial fulfillment of the
requirements for the degree
of Doctor in Engineering

Nice memories....



Nice memories....



Nice memories....



The mission...



Johan, mail, April 2022:

Ik heb sinds vorig jaar gewerkt aan de ontwikkeling van een website www.systemidentification.be die gaat over

Data Driven Modeling Of Dynamic Systems. An Introduction to (Non)linear System Identification
Het belangrijkste deel van deze website is de Hands-On sectie
(https://www.systemidentification.be/?page_id=76) waarin ik een "On-Line book" uitwerk gebruik maken van Matlab Live Scripts. Dit laat toe om matlab files te integreren in een latex tekst. Ik maak hiervan intensief gebruik om theoretische concepten te introduceren en onmiddellijk te illustreren in matlab. De gebruiker kan zelf een aantal parameters instellen (bvb. aantal punten, soort signalen, ruisniveau, ...) en op die wijze hands-on ervaring opdoen. Al deze informatie is publiek toegankelijk.

Data Driven Modeling Of Dynamic Systems

An Introduction to (Non)linear System
Identification Johan Schoukens

How can I extract a model from my experiments? How can I estimate a parameter value from my data? What is the impact of disturbances on the quality of my results? What is the “best” model that I can obtain from a given data set? Should I use a nonlinear model, or will a linear model do? These questions will be addressed on this website.



Project



How can I extract a model from my experiments? How can I estimate a parameter value from my data? What is the impact of disturbances on the quality of my results? What is the “best” model that I can obtain from a given data set? Should I use a nonlinear model, or will a linear model do?

All these questions deal with the extraction of information from data? *Data Driven Modeling* offers a generic framework to address these questions. *System Identification* is the sub-field that is focused on retrieving mathematical models for dynamical systems starting from experimental data.

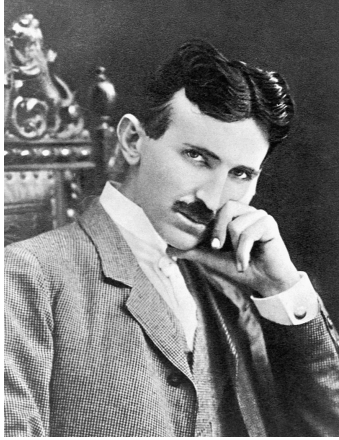
The goal of this website is twofold. Firstly, nonlinear system identification is introduced to a wide audience, guiding practical engineers and newcomers in the field to a sound solution of their data-driven modeling problems for nonlinear dynamic systems. In addition, the website also provides a broad perspective on the topic for researchers who are already familiar with linear system identification theory, showing the similarities and differences between linear and nonlinear problems.

The focus is on the basic philosophy, giving an intuitive understanding of the problems and the solutions, providing a guided tour of the wide range of user choices in (non)linear system identification. To reach these goals, we will make use of slides, supported by video presentations and short texts. Links are provided for the readers who want to learn more or to refresh their background knowledge. The existing literature will be referred too for detailed mathematical explanations and formal proofs.

The information is structured along two main lines: the development a Data Driven Modeling framework that is focused on the theoretical aspects, and a series of Exercises that provide hands-on experience.

[Data Driven Modeling](#) introduces the basic concepts of System Identification. Next, these tools are further used to present a framework to the Identification of Linear Systems and the Identification of Nonlinear Systems. Nonlinear system identification is much more involved than linear identification. For that reason, the intermediate solution Linear Modeling in the Presence of Nonlinear Distortions may be an acceptable solution to keep the modeling effort low.

The [Exercises](#) highlight many of the important steps in the identification process and give the user the possibility to provide hands-on experience. This helps to make the abstract concepts of the theory more accessible. The development of this website is a long-term project. Starting from the current basis, we intend to expand/update gradually the information in the coming years. We decided to make the website publicly accessible in this period, even if it is far from being finished. It is our strong believe that also the partial information can be very useful for many of our users. Moreover, the feedback that we get from these early experiences provides very valuable inputs for the further development of our project.



Nicola Tesla: “If you want to find the secrets of the universe, think in terms of energy, frequency and vibration”.



Joannes Schoukens: “It is the frequencies, stupid !”