

Curriculum Vitae

Bart De Schutter

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Contact address:

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Date of birth: Oct. 18, 1968

Nationality: Belgian

Marital status: married

Brief educational and work record

- Dec. 2006–now:** Full professor, Chair: Hybrid Control and Intelligent Transportation Systems, Delft Center for Systems and Control, Faculty of Mechanical, Maritime and Materials Engineering, Delft University of Technology (TU Delft), Delft, The Netherlands
Currently coaching 1 associate professor and 3 assistant professors; supervising (as daily supervisor) 8 PhD students and 3 postdocs; co-supervising 2 PhD students
In addition, supervised 16 PhD students, 15 postdocs, and 2 senior technical staff; co-supervised 6 PhD students and coached 1 associate professor
- Jan. 2004–Nov. 2006:** Associate professor, Delft Center for Systems and Control, Faculty of Mechanical, Maritime and Materials Engineering, TU Delft
Supervised 8 PhD students, 2 postdocs, and 2 senior technical staff; co-supervised 2 PhD students
- Oct. 2000–Sept. 2005:** Research fellow, SISTA research group, Department of Electrical Engineering, K.U.Leuven, Leuven, Belgium
- Feb. 2000–Dec. 2003:** Associate professor, Control Systems Engineering group, Faculty of Information Technology and Systems, TU Delft
Supervised 4 PhD students
- Aug. 1998–Jan. 2000:** Assistant professor, Control Lab/Control Systems Engineering group, Faculty of Information Technology and Systems, TU Delft
Supervised 3 PhD students
- Oct. 1996–July 1998:** Postdoc, SISTA research group, Department of Electrical Engineering, K.U.Leuven
- Feb. 1, 1996:** Obtained PhD degree at the Faculty of Applied Sciences of K.U.Leuven
Topic: “Max-algebraic System Theory for Discrete Event Systems”
Grade: summa cum laude and congratulations from the PhD examination committee (i.e., the highest possible distinction)
PhD thesis advisor: prof.dr.ir. B. De Moor

- Feb. 1993–Sept. 1996:** PhD student and researcher, SISTA research group, Department of Electrical Engineering, K.U.Leuven
- Aug. 1992–Aug. 1997:** Instructor at Memento, a student coaching office in Leuven, Belgium (during the evenings)
- Apr. 1992–Jan. 1993:** Military service as a computer specialist and system manager in Brussels, Belgium
- Sept. 1991–Mar. 1992:** PhD student, SISTA research group, Department of Electrical Engineering, K.U.Leuven
- Oct. 1986–July 1991:** BSc and MSc student electrotechnical-mechanical engineering at K.U.Leuven
 Specialization: control theory
 MSc thesis: “Design and simulation of neural controllers”
 Final grade: summa cum laude

Short list of scientific performances

- 3 books and 1 edited book
- 171 international journal papers
- 25 contributions to books
- 372 international conference papers
- h-index¹: **28** (ISI)
- 18 postdocs supervised
- 34 PhD students supervised (8 ongoing; 26 successfully graduated, of whom 4 cum laude)
- 54 MSc theses supervised
- 39 project acquisitions as main (local) applicant (total amount: ± k€ 5 479)
 Of these projects 8 are European, 22 national, 4 TU Delft, and 5 contract research
- 6 project acquisitions as (local) co-applicant (1 European, 4 national)
- 2 personal PhD grants (4 year each) and 1 personal postdoc grant (3 year) acquired
- 3 scientific awards

¹See also <http://www.researcherid.com/rid/B-7978-2011>

Activities at university, national, and international level (see next pages for extra details)

- Coordinator of an FP7 EU STREP project with partners from Germany, France, Italy, Spain, Belgium, Colombia, and USA
- Overall project leader of national projects with RU Groningen and with TU Eindhoven
- Overall project leader of national projects with other departments of TU Delft (CiTG)
- Project co-leader of an NSFC-NWO project with Shanghai Jiao Tong University

- Member of the Board of Governors of the IEEE Intelligent Transportation Systems Society (2008–2010, 2013–2018)
- Vice-chair of the IFAC Technical Committee on Transportation Systems (2006–2008, 2010-2013)
- Chair of the IFAC Technical Committee on Transportation Systems (2014–...)
- Vice-chair of the EU COST Action ARTS
- Invited lectures in Amsterdam (NL), Beijing (CN), Birmingham (UK), Brussels (BE), Cambridge (UK), Delft(NL), Durham (UK), Ghent (BE), Istanbul (TR), Lausanne (CH), Leuven (BE), Lucca (IT), Lund (SE), Maui (USA), Milan (IT), Mol (BE), Nancy (FR), Rennes (FR), Shanghai (CN), Siena (IT), The Hague (NL), Zandvoort (NL), Zürich (CH)

- Senior editor for *IEEE Transactions on Intelligent Transportation Systems*
- Associate editor for *IEEE Transactions on Automatic Control*, *IEEE Transactions on Intelligent Transportation Systems*, *IEEE Control Systems Letters*, *Automatica*, *Discrete Event Dynamic Systems: Theory and Applications*, and *Nonlinear Analysis: Hybrid Systems*
- Guest editor of special issues for *IEEE Transactions on Intelligent Transportation Systems* (3 times), *Transportation Research Part C*, *Journal of Process Control*, and *Nonlinear Analysis: Hybrid Systems*
- General (co-)chair of the 4th IFAC ADHS
- Program (co-)chair of NecSys 2013, IEEE ITSC 2013, IEEE ICNSC 2011, IEEE IV'08, and IEEE ITSC 2005
- IPC chair for IFAC CTS 2018, IFAC CTS 2016, IFAC CTS'09

- Member of the program board of TRAIL (June 2017–)
- Member of the Career Development Committee (“Loopbaancommissie”) of the Faculty 3mE, TU Delft
- Chair of the Education Committee MSc Systems and Control, TU Delft
- Member of “benoemingsadviescommissies (BAC)” (faculty search committees) at TU Eindhoven and TU Delft (3mE, CiTG, TBM, EWI)

Acquired projects and grants (as main (local) applicant)

As overall project leader and/or main applicant

1. NWO Van Gogh grant for cooperation with Supélec Rennes (FR), 2014–2015 (funding received: k€ 4.6)
2. “Multi-party risk management and key performance indicator design at the whole system level (PYRAMIDS)”, NWO²-MAGW/ProRail project, in cooperation with RU Groningen and TU Delft CiTG), 2013–2017 (k€ 212)
Role: overall project leader (total project budget: k€ 637)
3. “Advanced monitoring of intelligent rail infrastructure (ADMIRE)”, STW³/ProRail project, with TU Delft (CiTG), 2012–2016 (k€ 236)
Role: overall project leader (total project budget: k€ 473)
4. “Sustainable mobility with cooperative vehicle-infrastructure systems”, BSIK-NGI (Next Generation Infrastructures) project, with TU Delft (CiTG), 2010–2012 (k€ 104)
5. “Model-based predictive control for intelligent micro-transportation systems”, BSIK-NGI project, 2010–2012 (k€ 137)
6. “Model-based predictive control for intelligent water management – Towards real-life implementation”, BSIK-NGI project, with TU Delft (CiTG), 2010–2012 (k€ 69)
7. “Hierarchical and distributed model predictive control of large-scale systems (HD-MPC)”, European 7th framework STREP project, with POLIMI (IT), K.U.Leuven (BE), RWTH Aachen (DE), Univ. Sevilla (ES), Supélec (FR), UNC (CO), UWM (USA), EDF (FR), INOCSA (ES), 2008–2011 (k€ 382)
I was the *coordinator* of this project (total project budget: M€ 2.769)
8. “Intelligent model-based predictive control methods for flood and water management”, BSIK-NGI and TU Delft-NGI project, 2008–2010 (k€ 300)
9. “Modeling and control of transportation networks and logistic systems”, Faculty of Mechanical, Maritime and Materials Engineering (3mE) project, 2007–2009 (k€ 120)
10. “Model-based traffic flow control for sustainable mobility”, Shell/TU Delft project, 2006–2010 (k€ 300)
11. NWO Van Gogh grant for cooperation with Supélec Rennes (FR), 2006–2007 (k€ 19)
12. “Multi-agent coordination and intelligent control of infrastructure networks”, BSIK-NGI project, 2004–2012 (k€ 74)
13. “Adaptive learning for multi-agent coordination and control”, BSIK-ICIS (Intelligent Collaborative Information Systems) project, 2004–2009 (k€ 204)
14. “Network-wide traffic management — Multi-agent control strategies for integrated control of freeway and urban traffic networks”, Traffic Research Centre Delft project, 2004–2006 (k€ 91)
15. “Multi-agent control of large-scale hybrid systems”, NWO/STW VIDI Innovational Research Incentives Program project, 2004–2008 (k€ 495)
16. “Robust coordinated control of freeway and urban traffic networks”, Traffic Research Centre Delft project, 2003–2004 (k€ 9)
17. “Model predictive control for hybrid systems”, STW project, with TU Eindhoven, 2002–2006 (k€ 210)

²NWO: The Netherlands Organization for Scientific Research

³STW: Dutch Technology Foundation

As local project leader and/or main local applicant

18. “Performance assessment methodology for automated vehicles using real-life driving data”, PhD project funded by TNO, 2017–2018 (funding received: k€ 40)
19. “Innovative controls for renewable sources Integration into smart energy systems (INCITE)”, European Innovative Training Network project, with among others UPC (Spain), Univ. of Bologna (Italy), VITO (Belgium), General Electric (Germany), 2015–2018 (k€ 255)
20. “Car as Power Plant – Fuel cell cars creating an integrated, efficient, reliable, flexible, clean, multi modal and smart transport and energy system”, NWO-Shell project, with TU Delft and Utrecht University, 2014–2018 (k€ 210)
21. “Multi-level predictive traffic control for large-scale urban networks”, NSFC-NWO project, with Shanghai Jiao Tong University, China, 2013–2017 (k€ 259)
22. “Integrated scheduling and control for cyber-physical systems”, STW-Perspectief project, with Univ. Nijmegen and TU Eindhoven, 2013–2017 (k€ 200)
23. “Towards autonomic road transport support systems”, European COST Action TU1102, 2011–2015 I am vice-chair of this project
24. “Highly-complex and networked control systems (HYCON2)”, European 7th Framework Network of Excellence, 2010–2014 (k€ 125)
25. “Literatuurstudie coördinatie in verkeersmanagement (Literature survey on coordination in traffic management)”, project for the Dutch Ministry of Transport, Public Works and Water Management, 2009 (k€ 20)
26. “Externe experttoets Praktijkproef Verkeersmanagement Amsterdam (Evaluation by external experts of the Practical Test Traffic Management Amsterdam)”, participation in an expert evaluation for the Dutch Ministry of Transport, Public Works and Water Management, 2009 (k€ 8)
27. “Real-time monitoring, surveillance and control of road networks under adverse weather conditions”, European COST Action TU0702, 2008–2012
28. Evaluation of the feasibility study “Verkeersverwachting” (Traffic Forecast) proposed by Rups Adviseurs voor Innovatie, Schiedam, The Netherlands, 2005 (k€ 3)
29. “Integrated model predictive control” and “Decentralized Control”, BSIK-TRANSUMO (Transition Sustainable Mobility) ATMA subprojects, 2004–2009 (k€ 145)
30. “Decentralized traffic control and management with intelligent vehicles” and “Design and communication aspects”, BSIK-TRANSUMO IV subprojects, 2004–2009 (k€ 157)
31. “HYbrid CONTROL: Taming Heterogeneity and Complexity of Networked Embedded Systems (HYCON)”, European 6th Framework Network of Excellence, 2004–2009 (k€ 157)
32. “Design methodology for fault-tolerant control of advanced driver assistance systems”, TNO-TRAIL project, 2003–2004 (k€ 103)
33. “BOSS scenario evaluatie (Decision support system scenario evaluation)”, project for the Dutch Ministry of Transport, Public Works and Water Management, 2002 (k€ 16)
34. “Modelling, simulation and control of nonsmooth dynamical systems (SICONOS)”, European 5th Framework research project, 2002–2006 (k€ 16)
35. “Development of advanced multi-agent control strategies for multi-class traffic networks”, NWO-CONNEKT AMICI subproject, 2002–2006 (k€ 149)

36. “Fuzzy decision support system for traffic control centers”, project for AVV, Dutch Ministry of Transport, Public Works and Water Management, 1999–2000 (k€ 22)
37. “Advanced control techniques for optimal adaptive traffic control”, TRAIL-AVV project, 1999–2002 (k€ 131)
38. “Traffic congestion problems in Belgium: mathematical models, analysis, simulation, control and actions”, DWTC (Belgian Federal Office for Scientific, Technical and Cultural Affairs) project, 1997–2000 (k€ 178)
39. “ALAPEDES (The Algebraic Approach to Performance Evaluation of Discrete Event Systems)”, European Commission TMR project, 1996–2000 (k€ 268)

Prizes and Awards

- 2009 Andrew P. Sage Best Transactions Paper Award for the paper L. Buşoniu, R. Babuška, and B. De Schutter, “A comprehensive survey of multiagent reinforcement learning,” *IEEE Transactions on Systems, Man, and Cybernetics – Part C: Applications and Reviews*, vol. 38, no. 2, pp. 156–172, March 2008
- R. Stock Prize for PhD theses in Applied Sciences at K.U.Leuven in the period 1996–1998
- Biennial 1998 Richard C. DiPrima Prize (for my PhD thesis, awarded by SIAM (Society for Industrial and Applied Mathematics))

Educational activities

- Lecturer for the following BSc courses:
 - Systems and control (2014–now)
 - Control engineering for marine engineers (2008–2014)
 - Advanced control systems (2006–2008)
- Evaluator of BSc design projects (1999–2006)
- Lecturer for the following MSc courses:
 - Modeling and control of hybrid systems (2004–now)
 - Optimization in systems and control (1998–now)
 - Practical control systems (2002–2004)
 - Modeling, identification and simulation (1999–2002)
 - Theory of hybrid systems (1999–2000)
- Lecturer for the following Postgraduate lectures and courses:
 - Modeling and control of hybrid systems (DISC (Dutch Institute of Systems and Control) course in cooperation with Maurice Heemels (Eindhoven University of Technology), 2002–now (once every 2 years))
 - Model-based predictive traffic control (lecture in the PAO (Foundation Postacademic Education) course “Dynamic traffic management”, 2005, 2007, 2009)
- 2007, 2008: co-organized TRAIL/SIKS postgraduate course on “Multi agent systems: Theory, technology and applications”
- 2006: initiated MSc student exchange cooperation (within the European Socrates program) with the University of Cagliari, Italy

- 2003: co-organized DISC Summer School on “Modeling and control of hybrid systems” (Veldhoven, The Netherlands, June 2003)
- Sept. 2000–Nov. 2003: MSc contact person for the Control Lab/Control Systems Engineering group, TU Delft
- 1993–1996: ombudsman for the students of the 2nd technical year Electrical Engineering at K.U.Leuven

Research and other academic activities

- Main research interests: large-scale transportation networks (in the wide sense of the word), infrastructure networks, multi-level control, multi-agent systems, discrete-event systems, hybrid systems, traffic control, and optimization
- Jan. 2016–now: senior editor for *IEEE Transactions on Intelligent Transportation Systems*
- Jan. 2018–now: associate editor for *IEEE Transactions on Automatic Control*
- 2017–now: associate editor for *IEEE Control Systems Letters*
- Jan. 2013–now: associate editor for *Discrete Event Dynamic Systems: Theory and Applications*
- March 2011–Dec. 2016: associate editor for *Nonlinear Analysis: Hybrid Systems*
- July 2004–Dec. 2015: associate editor for the *IEEE Transactions on Intelligent Transportation Systems*
- Sept. 2004–July 2016: associate editor for *Automatica*
- General (co-)chair of the 4th IFAC Conference on Analysis and Design of Hybrid Systems (ADHS 2012), Eindhoven, The Netherlands, 2012
- Program co-chair of the 16th IEEE International Conference on Intelligent Transportation Systems (ITSC 2013), The Hague, The Netherlands, 2013
- Program co-chair of the 4th IFAC Workshop on Distributed Estimation and Control in Networked Systems (NecSys 2013), Koblenz, Germany, 2013
- Program co-chair of the 8th IEEE International Conference on Networking, Sensing and Control (ICNSC 2011), Delft, The Netherlands, 2011
- Program chair of the 2008 IEEE Intelligent Vehicle Symposium (IV’08), Eindhoven, The Netherlands, 2008
- Program co-chair of the 8th IEEE Conference on Intelligent Transportation Systems (ITSC 2005), Vienna, Austria, 2005
- IPC chair for 15th IFAC Symposium on Control in Transportation Systems (CTS 2018), Savona, Italy, 2017; 14th IFAC Symposium on Control in Transportation Systems (CTS 2016), Istanbul, Turkey, 2016; 12th IFAC Symposium on Transportation Systems (CTS’09), Redondo Beach, California, 2009
- Member of national organizing committee of the 11th IFAC Symposium on Control in Transportation Systems (CTS 2006), Delft, The Netherlands, 2006
- Member of the international program committee of among others
 - American Control Conference (ACC) in 2005,
 - European Control Conference (ECC) on 2013 and 2015,
 - IEEE Conference on Decision and Control (CDC) in 2004, 2008, and 2011

- IEEE Conference on Intelligent Transportation Systems (ITSC) in 2004, 2006–2007, 2009–2012, 2014–2016,
 - IEEE Intelligent Vehicles Symposium (IV) in 2007, 2010, 2011, 2013, 2016, 2017
 - IEEE International Conference on Networking, Sensing and Control (ICNSC) in 2006–2007 and 2010–2013,
 - IFAC Symposium on Control in Transportation Systems (CTS) in 2006, 2009 (as **IPC chair**), and 2012
 - IFAC World Congress (2017)
 - International Conference on Hybrid Systems: Computation and Control (HSCC) in 2007 and 2008
 - International Workshop on Discrete Event Systems (WODES) in 2002, 2004, 2008, 2010, 2016
 - Triennial Symposium on Transportation Analysis (TRISTAN) in 2016
 - Workshop on Distributed Estimation and Control in Networked Systems (NecSys) in 2009 and 2010
- 2003–now: member of the IFAC Technical Committee on Transportation Systems
 - 2006–now: member of the IFAC Technical Committee on Discrete Event and Hybrid Systems
 - 1996–2004: reviewer for *Mathematical Reviews*
 - Reviewed manuscripts and book proposals for Elsevier, Princeton University Press, SIAM, Springer, and Wiley

Executive activities

- June 2013–now: Member of the Career Development Committee of the Faculty 3mE, TU Delft
- June 2011–now: chair of the Education Committee MSc Systems and Control, TU Delft
- Jan. 2011–now: head of the research group Hybrid, Adaptive, and Nonlinear Systems of the Delft Center for Systems and Control (DCSC)
- Mar. 2005–now: member of the management team of DCSC
- June 2014–now: chair of the IFAC Technical Committee on Transportation Systems
- Jan. 2008–Dec. 2010 and Jan. 2013–Dec. 2018: member of the Board of Governors of the IEEE Intelligent Transportation Systems Society
- Jan. 2006–June 2008, Jan. 2010–June 2014: vice-chair of the IFAC Technical Committee on Transportation Systems
- Sept. 2008–Dec. 2011: coordinator of the European 7th framework STREP project HD-MPC

Additional information

- Member of IEEE since 2008; senior member since 2010
- Attended language courses at the CLT (Center for Modern Languages) in Leuven:
 - Italian from Sept. 1999 up to June 2006
 - Spanish from Oct. 1993 to June 1999
 - German from Oct. 1991 to June 1993

- Oct. 20, 1990: participated in GMAT test (worldwide admission test for MBA studies)
Score: verbal 96 %, quantitative 99 %, global 99 %
- 1989–1990: responsible for sponsoring and publicity for lectures organized by Student Branch of IEEE-Leuven
- Computer skills: extensive experience with several computer operating systems (Windows, Unix, and Linux), Linux system management, and setting up and maintaining web sites
Software: Matlab, L^AT_EX, MS Office, OpenOffice
- Hobbies: swimming, squash, cycling, and learning languages
- Languages: fluent in Dutch, French, and English; good knowledge of German, Spanish, and Italian