

Dr. Florian Knorn

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Background

- 1998 – 1999 AFS student exchange year to Christchurch, New Zealand
- 1999 – 2001 Collège Français de Berlin, Germany
- 2001 Abitur and Baccalauréat (Série S) at the Collège Français de Berlin, Germany
- 2001 – 2006 Studies of Engineering Cybernetics, O.v.G.–University Magdeburg, Germany
- 2002 – 2004 Research Assistant, Max–Planck–Institut, Magdeburg, Germany
- 2005 Research Student, Hamilton Institute, NUI Maynooth, Ireland
- 2005 – 2006 Internship, DaimlerChrysler Research & Technology, Germany
- 2006 Diploma thesis, ARC Centre for Complex Dyn. Systems & Control, Australia
- 2006 Degree of “Diplom-Ingenieur” ⁽¹⁾ from O.v.G.–Univ, Magdeburg, Germany
- 2006 – 2007 Research Assistant, Technische Universität Berlin, Germany
- 2008 – 2011 PhD, Hamilton Institute, NUI Maynooth, Ireland

Areas of specialisation

- Cooperative control and control theory
- Positive systems and systems theory
- Electric vehicles, wireless sensor networks, robotics
- Photography incl. panoramic photography
- Videography and audio productions
- Mobile app and web development

Computer Skills

- Windows, Mac OS, Linux
- MATLAB and SIMULINK
- C, Python, Javascript, HTML, PHP, MySQL
- \LaTeX , Microsoft Office, Adobe Photoshop, Final Cut Pro, XCode, PTGui

Languages

- German, English and French (fluent, with full professional proficiency)
- Spanish, Latin and Ancient Greek (elementary proficiency)

Research experience

- Four years research as part of Ph.D. programme, initially focussing on anomaly detection in software appliances (Prof. D. Leith), then theory of positive systems, cooperative control and constrained consensus in multi-agent systems (Prof. R. Shorten). Applications included wireless sensor networks and fleets of electric vehicles (2007–2011).

⁽¹⁾ With *summa cum laude* / *Fist Class Honours*.

- Six months as a research student working on deliberate passing behaviour in RoboCup Four Legged League robots, Prof. R. H. Middleton, ARC Centre for Complex Dynamics & Control, University of Newcastle, Australia (2006).
- Six months as a research student working on the analysis of complex networks, Prof. R. Shorten, Hamilton Institute, NUI Maynooth, Ireland (2005).
- Two years as a research assistant working on educational control experiments like the high wire walker and the inverted triple pendulum, Systems Theory group of Prof. J. Raisch, Max Planck Institute of Dynamics of Complex Technical Systems, Magdeburg, Germany (2002–2004).

Publications

- F. Knorn, M. Corless, and R. Shorten. *A Result on Implicit Consensus with Application to Emissions Control*. To appear in CDC'11: PROCEEDINGS OF THE 50TH IEEE CONFERENCE ON DECISION AND CONTROL, December 2011, Orlando, FL, USA.
- F. Knorn. *Topics in Cooperative Control*. Ph.D. Thesis, June 2011. Examiner: Prof. Abraham Berman, Technion, Israel.
- A. Zappavigna, T. Charalambous, F. Knorn. *Unconditional Stability of the Foschini-Miljanic Algorithm*. To appear in AUTOMATICA, 2011.
- F. Knorn, M. Corless, and R. Shorten. *Results in Cooperative Control and Implicit Consensus*. INTERNATIONAL JOURNAL OF CONTROL, Volume 84, Issue 3, March 2011, pp.476–495.
- F. Knorn, O. Mason, R. Shorten. *Applications of Linear Co-positive Lyapunov Functions for Switched Linear Positive Systems*. In POSTA'09: THIRD MULTIDISCIPLINARY INTERNATIONAL SYMPOSIUM ON POSITIVE SYSTEMS: THEORY AND APPLICATIONS, September 2009, Valencia, Spain, pp. 331–338.
- F. Knorn, R. Stanojevic, M. Corless, and R. Shorten. *A Problem in Positive Systems Stability Arising in Topology Control*. In POSTA'09: THIRD MULTIDISCIPLINARY INTERNATIONAL SYMPOSIUM ON POSITIVE SYSTEMS: THEORY AND APPLICATIONS, September 2009, Valencia, Spain, pp. 339–447.
- F. Knorn, O. Mason, R. Shorten. *On Linear Co-positive Lyapunov Functions for Sets of Linear Positive Systems*. AUTOMATICA, Volume 45, Issue 8, August 2009, pp. 1943–1947.
- F. Knorn, R. Stanojevic, M. Corless, and R. Shorten. *A Framework for Decentralised Feedback Connectivity Control with Application to Sensor Networks*. INTERNATIONAL JOURNAL OF CONTROL, Volume 82, Issue 11, November 2009, pp. 2095–2114.
- F. Knorn, D. Leith. *Adaptive Kalman Filtering for Anomaly Detection in Software Appliances*. In PROC. 2008 INFOCOM WORKSHOP ON AUTOMATED NETWORK MANAGEMENT (ANM), Phoenix, AZ, USA.

Teaching experience

- Seminars on the usage of MATLAB and SIMULINK
- Seminars on Ranking and Importance in Complex Networks
- Seminars on the implementation of Deliberate Passing Behaviour in the RoboCup Four Legged League
- Control theory course tutoring

Scholarships

- 2003–2006, scholar of the German National Academic Foundation

Work experience

- Six months internship working on the control of an active hydraulic suspension, Prof. Jens Kalkkuhl, vehicle system dynamics department, Daimler Research & Technology, Böblingen, Germany (2006).
- Summer Internships with electricians and mechanical engineers in a gear manufacturing factory, MMB Magdeburger Maschinenbau, Germany (2002).

Patents

- DE 10 2006 024 366.8 (inventor; filed by Daimler Research & Technology): “Device for the control of the forward movement of a vehicle”.

Extracurricular projects

- Complete development of an iPhone application for the university and town of Maynooth, started on personal initiative and ultimately sold to NUI Maynooth.
- Development of a mobile web application for a virtual tour featured on USA ABC's Extreme Makeover: Home Edition.
- Video recording, processing and publishing of various seminars held at NUI Maynooth and in Dublin.
- Extensive freelance photography for NUI Maynooth, private persons and businesses in the Dublin area.
- Web design and development for businesses in Ireland.
- Podcasting (personal podcast, and podcast of a self-written audio play).

References

- Prof. Robert Shorten, Hamilton Institute,
NUI Maynooth, Ireland
Robert.Shorten@nuim.ie
- Prof. Richard H. Middleton, ARC Centre for Complex Dynamics & Control,
University of Newcastle, Australia
Richard.Middleton@newcastle.edu.au
- Prof. Jens Kalkkuhl, vehicle system dynamics department,
Daimler Research & Technology, Böblingen, Germany
Jens.C.Kalkkuhl@Daimler.com
- Prof. Jörg Raisch, Fachgebiet Regelungssysteme,
Technische Universität Berlin, Germany
Raisch@control.tu-berlin.de

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Florian Knorn, 28 August 2011