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Education

2005	ETH Zurich PhD in Electrical Engineering <ul style="list-style-type: none">• Title: Design and Deployment of Wireless Networked Embedded Systems• Advisors: L. Thiele, ETH Zurich and J.M. Rabaey, UC Berkeley• Defended on August 24, 2005	Zurich, Switzerland
2003 – 2005	Austrian Association of Skiing Instructors Certification as Ski Instructor and Alpine Ski Guide (ISIA)	Innsbruck, Austria
2000 – 2005	ETH Zurich Doctoral Student	Zurich, Switzerland
2000	ETH Zurich Master in Electrical Engineering <ul style="list-style-type: none">• Title: Geolocation in a PicoRadio Environment• Advisors: J.M. Rabaey, UC Berkeley and G. Tröster, ETH Zurich	Zurich, Switzerland
1994 – 1999	ETH Zurich Studies in Electrical Engineering	Zurich, Switzerland
1980 – 1993	Various schools School education	Germany and Saudi Arabia

Professional Experience

2005 – present	Computer Engineering and Networks Lab, ETH Zurich Senior Researcher <ul style="list-style-type: none">• Senior researcher in embedded and wireless systems• Responsible for the groups research activities• Project acquisition and management• Supervision of term, master and PhD thesis projects• Lead architect of the BTnode platform	Zurich, Switzerland
2000 – 2005	Computer Engineering and Networks Lab, ETH Zurich	Zurich, Switzerland

	<p>Research Assistant</p> <ul style="list-style-type: none"> • Research projects in the areas of wireless ad hoc and sensor networks, wearable and mobile computing systems • Teaching assistant for graduate courses in computer architecture and embedded systems design • Supervision of numerous term and master thesis projects • Hard- and software design and development • Lead architect of the BTnode platform 	
1999	Berkeley Wireless Research Center, UC Berkeley	Berkeley, CA
	<p>Associate Researcher</p> <ul style="list-style-type: none"> • Associate researcher, PicoRadio project • Development of localization algorithms for ultra low-power wireless devices 	
1998 – 1999	u-blox AG	Zurich, Switzerland
	<p>Technical Staff</p> <ul style="list-style-type: none"> • Technical staff, research and development of GPS receivers, related products and factory testing facilities • Evaluation and maintenance of CAD tools 	
1996 – 1998	Electronics Lab, ETH Zurich	Zurich, Switzerland
	<p>Teaching Assistant</p> <ul style="list-style-type: none"> • Teaching assistant for undergraduate courses and labs in electronic design 	
1995 – 1998	Institute of Forming Technology, ETH Zurich	Zurich, Switzerland
	<p>Technical Staff</p> <ul style="list-style-type: none"> • Technical staff, maintenance of laboratory automation, test and measurement equipment • Development of measurement systems and automation applications for a metallurgy research project 	

Research Projects

2005 – present	<p>Safety Critical Sensor Networks for Building Applications – The project focuses on hard dependability and real-time constraints in wireless sensor networks applied to a distributed wireless fire-alarm application. For sustainable operation it is crucial that the system exhibits very high dependability, small energy consumption and adherence to the stringent timing constraints required by the application. This will introduce to the domain of wireless sensor networks yet unavailable solutions to meet hard real-time constraints and performance guarantees as opposed to current dominating best-effort practices.</p> <p>2 PhD positions at ETH Zurich (joint with B. Plattner, Siemens Building Technologies and CSEM), 1.5 Mio CHF for 3 years</p>
2005 – present	<p>NCCR-MICS – NCCR-MICS is the Swiss center for self-organizing mobile information and communication systems.</p> <p>Sensor Network Platform Kit – The Sensor Network Platform Kit aims at creating a sensor network out-of-a-box for basic low power sensing and data collection applications, e.g. environmental monitoring. Furthermore it will provide support and system integration know-how for application projects within NCCR-MICS.</p>

2 staff, 1 student helper – planned extension to 4-5 people at MICS locations (ETHZ, EPFL, Yverdon, and Basel) Funding: 180 + 50 kCHF for the first year

Deployment of Sensor Networks – This project addresses the deployment and programming problem of large-scale sensor networks in real-world settings. Its ultimate goal is to replace the current "trial-and-error deployment practice" with a systematic approach. (joint work with F. Mattern)

Serious Building Games – The overall goal of this project is to simplify intelligent environments using wireless technology. One driver here are intelligent buildings and the other are so-called sick buildings, which require careful analysis of the energy consumption and ventilation using sensor network technology. (joint work with L. Hovestadt, M. Morari and T. Gross)

MICS Working Group 2 – Sensor and Actuator Platforms – The working group 2 is a study group across the MICS network that aims at creating a forum for the exchange and discussion of platform related issues of the different MICS projects.

- 2000 – present **BTnode Project** – The BTnode is a versatile and reliable platform for fast prototyping of sensor network applications and experiments. The BTnode rev3 is successfully used in many research projects spanning from wearable and ubiquitous computing applications using few nodes to large, interactive networking applications. Additionally the BTnodes are used in university education and training. To date, the BTnode hardware has been used by 30+ research groups. This has led to a substantial gain in experience throughout the community, numerous well perceived publications both by members of the BTnode project, closely related researchers as well as third parties (40+ scientific publications based on or related to BTnodes) and about 30-40 successfully completed student projects at ETHZ alone. A close cooperation with the TinyOS Alliance is ongoing. (joint work with F. Mattern)
- 2001 – 2005 **NCCR-MICS – Communicating Embedded Systems** – The project focused on an extreme area in the design space of communicating objects: the area of low energy, small size, and large population. Resulting in a close cooperation of algorithm design (R. Wattenhofer), aspects of middleware (F. Mattern) and system architecture (L. Thiele) is the work on the BTnode platform (see above) as well as a number of well-perceived publications.
- 2000 – 2004 **Miniaturized Wearable Computing: Technology and Applications** – Investigation of novel communication structures for wearable computing systems and applications. System level architectural modeling and analysis using state-of-the-art design space exploration tools were applied to the new domain of wearable computing and published in IEEE Transactions on Computers (joint work with G. Tröster).
- 1999 **PicoRadio** – Associate researcher with the PicoRadio project at UC Berkeley. Development of initial concepts for ultra-low power wireless localization. Based on experiments, a hybrid approach to determine the position of wireless networked nodes and suitable for the limited capabilities of such miniature sensor nodes has been developed. The resulting publications (with C. Savarese and J.M. Rabaey) were among the first in the field and have received a lot of attention in the scientific community.

Industrial Technology Transfer

- Commercialization of the BTnode platform with the ETH Zurich spin-off "Art of Technology"

Teaching Experience

- Hands-on tutorial "Fast-prototyping of Wireless Sensor Networks" – INSS 2007, Braunschweig, Germany
- Hands-on tutorial "Reliable Multihop Networking using Bluetooth" – EWSN 2007, Delft, The Netherlands
- Lecturer in Hardware Software Codesign at ETH Zurich
- Lecturer at the department introduction for prospective students (Technikwoche Kantonsschule Limmattal) – ETH Zurich, 2006
- Lecturer at the Special Day on Wireless Sensor Networks – DATE 2006, Munich, Germany
- Lecturer at the introductory days for prospective students (Informationstage für Maturandinnen und Maturanden) – ETH Zürich, 2005
- Lecturer at the Summer School on Wireless Sensor Networks and Smart Objects – Schloss Dagstuhl, Germany, August 29 – September 3, 2005
- Concept, development and supervision of a new 5 session lab based on the BTnode platform for the graduate courses "Embedded Systems" (120 participants annually) and "Wireless Sensor Networks" (30 participants annually) at ETH Zurich
- Development and support of wireless communication infrastructure based on the BTnode platform for an undergraduate lab using Lego Mindstorms
- Concept, development and lecturer at multiple workshops on embedded programming and introduction to wireless sensor network platforms at ETH Zurich and EPF Lausanne (BTnode Hackfest)
- Extension, maintenance and supervision of a tutorial for modeling discrete event processes (MOSES tutorial) for the graduate course "Discrete Event Systems" at ETH Zurich (60 participants)
- Teaching assistant for courses in Circuits and Systems, Computer Engineering, Advanced Computer Architecture, Discrete Event Systems, Embedded Systems and Hardware Software Codesign at ETH Zurich. Responsibilities include the creation, maintenance and supervision of exercises and the preparation and grading of exams.
- Lecturer at the Microsoft Research Academic Days 2003 – .NET mobile distributed and embedded technologies, Politecnico di Torino, Italy
- Supervision and management of numerous master and term thesis projects in the area of wireless networks and embedded systems:

Master Thesis Projects

- T. Rein – Energie-effiziente Wireless Netzwerksynchronisation
- T. Kalt – Online Sensor Network Analysis Tools
- R. Lim – Wireless Fire Sensor Network Demonstrator
- P. Oehen – DSNAalyzer: Backend for the Deployment Support Network
- M. Yücel – Role and Link-State Selection for XTC Scatternets
- L. Winterhalter, D. Hobi – Large-scale Bluetooth Sensor-Network Demonstrator
- K. Martin – Adaptive XTC on BTnodes
- P. Fercher – Mobiler FPGA mit Bluetooth Kommunikation
- U. Frey – Topologie und Positionsbestimmung in Mobilien Ad-hoc Netzwerken
- M. Lerjen, C. Zbinden – Reconfigurable Bluetooth Ethernet Bridge

Term Thesis Projects

- M. Wirz - Analyse der Übertragungsqualität drahtloser Kommunikation
- P. Stadelmann – BTnode Peripherie
- S. Zimmermann – Online Sensor Network Monitoring
- A. Dogan – TinyOS on BTnodes
- T. Hug, F. Süß – Mote/TinyOS meets BTnode
- A. Kalapos, L. Quach – Head Tracking Wireless Network
- S. Kasper, L. Bühler – Jini Discovers Bluetooth
- E. Wandeler – Analyse von Algorithmen zur verteilten Positionierung

- A. Erni, S. Reichmuth – Bluetooth Anbindung für Lego Mindstorms
- L. Moser, S. Tschumi – Positionierung in Bluetooth Netzwerken
- E. Burgener, P. Fercher – Grenzenlose Piconetze mit Bluetooth
- L. Wernli, R. Semadeni – Bluetooth Unleashed, Wireless Netzwerke ohne Grenzen
- R. Strahl – Build Your Own World

Community Services

Conference and Workshop Organization

- NSDR 2007 – Workshop on Networked Systems for Developing Regions held in conjunction with ACM SIGCOMM 2007, Tokyo, Japan – PC member, publications chair
- INSS 2007 – The Fourth International Conference on Networked Sensing Systems, Braunschweig, Germany – PC member
- EmNets 2007 – The Fourth Workshop on Embedded Networked Sensors, Cork, Ireland – PC member
- AHSP 2007 – The Second International Workshop on Ad Hoc, Sensor and P2P Networks, Sedona, Arizona – PC member
- EWSN 2007 – The Fourth European Workshop on Wireless Sensor Networks, Delft, The Netherlands – PC member
- SenSys 2006 – The Fourth ACM Conference on Embedded Networked Sensor Systems, Boulder, CO – PC member, session chair
- MobiQuitous 2006 – The Third Annual International Conference on Mobile and Ubiquitous Systems: Networks and Services, San Jose, CA – PC member
- INSS 2006 – The Third International Conference on Networked Sensing Systems, Chicago, IL – PC member
- MobiQuitous 2005 – The Second Annual International Conference on Mobile and Ubiquitous Systems: Networking and Services, San Diego, CA – PC member
- UbiComp 2005 – The Seventh International Conference on Ubiquitous Computing, Tokyo, Japan – Demo Committee

Reviewing

Journals – ACM Transactions on Embedded Computing Systems (TECS) Spec. Issue on Power Aware Computing, Communications of the ACM, IEEE Transactions on Mobile Computing, IEEE Transactions on Computers, IEEE Transactions on Systems, Man, and Cybernetics, IEEE Communication Letters, IEEE Communications Magazine, IEEE Internet Computing, Springer Journal of Ubiquitous and Personal Computing

Conference Reviews – AHSP 2007, CASES 2003, EWSN 2005, 2006, 2007, ICC 2002, 2003, 2005, ICCAD 2002, ICCD 2001, INSS 2006, ISWC 2004, 2005, 2006, ISWPC 2007, LOCA 2005, MobiQuitous 2005, 2006, SECON 2004, SenSys 2005, 2006, TRIDENTCOM 2005, UbiComp 2003, 2005, 2006

Book Reviews – IEEE Press: Sensor Networks Operations

Publications

Book Chapter and Theses

J. Beutel: *Design and Deployment of Wireless Networked Embedded Systems*. PhD Thesis, ETH Zurich, August 2005.

J. Beutel: *Location Management in Wireless Sensor Networks*. Chapter in *Handbook of Sensor Networks: Compact Wireless and Wired Sensing Systems*. CRC Press, Boca Raton, FL, 2004.

J. Beutel. *Geolocation in a PicoRadio Environment*. Master Thesis, ETH Zurich and UC Berkeley, December, 1999.

Journals

J. Beutel: *Robust Topology Formation using BTnodes*. Computer Communications, Elsevier B.V., Amsterdam, The Netherlands, pages 1523-1530, Volume 28, Issue 13, August 2005.

U. Anliker, J. Beutel, M. Dyer, R. Enzler, P. Lukowicz, L. Thiele and G. Tröster: *A Systematic Approach to the Design of Distributed Wearable Systems*. IEEE Transactions on Computers, Vol. 53, No. 8, pages 1017-1033, August 2004.

C. Plessl, R. Enzler, H. Walder, J. Beutel, M. Platzner, L. Thiele, and G. Tröster: *The Case for Reconfigurable Hardware in Wearable Computing*. Personal and Ubiquitous Computing, Springer-Verlag, Vol. 7, No.5, pages 299-308, October 2003.

Conferences and Workshops

J. Beutel, M. Dyer, M. Yucel and L. Thiele: *Development and Test with the Deployment-Support Network*. Proc. 4th European Conference on Wireless Sensor Networks (EWSN 2007), pages to appear, January, 2007.

M. Dyer, J. Beutel, L. Thiele: *S-XTC: A Signal-Strength Based Topology Control Algorithm for Sensor Networks*. Proc. 2nd Second International Workshop on Ad Hoc, Sensor and P2P Networks (AHSP 2007), pages to appear, March 2007.

M. Dyer, J. Beutel, L. Thiele, T. Kalt, P. Oehen, K. Martin, P. Blum: *Deployment Support Network - A Toolkit for the Development of WSNs*. Proc. 4th European Conference on Wireless Sensor Networks (EWSN 2007), Springer Verlag, Berlin, pages to appear, January, 2007.

J. Beutel: *Metrics for Sensor Network Platforms*. Proc. ACM Workshop on Real-World Wireless Sensor Networks (REALWSN'06), ACM Press, New York, pages 26-30, June 2006.

J. Beutel: *Fast-prototyping Using the BTnode Platform*. Proc. Design, Automation and Test in Europe (DATE 2006), pages 977-982, March 2006.

J. Beutel, M. Dyer and K. Martin: *Sensor Network Maintenance Toolkit*. Proc. 3rd European Workshop on Wireless Sensor Networks (EWSN 2006), pages 58-59, February 2006.

L. Negri, J. Beutel and M. Dyer: *The Power Consumption of Bluetooth Scatternets*. Proc. IEEE Consumer Communications and Networking Conference (CCNC 2006), pages 519-523, January 2006.

J. Beutel, M. Dyer, L. Meier, and L. Thiele: *Scalable Topology Control for Deployment-Support Networks*. Proc. 4th Int'l Conf. Information Processing in Sensor Networks (IPSN '05), pages 359-363, April 2005.

J. Beutel and A. Dogan: *Using TinyOS on BTnodes*. 4. GI/ITG KuVS Fachgespräch Drahtlose Sensornetze, ETH Zurich, pages 6-10, March, 2005.

M. Dyer, J. Beutel and L. Meier: *Deployment Support for Wireless Sensor Networks*. 4. GI/ITG KuVS Fachgespräch Drahtlose Sensornetze, ETH Zurich, pages 25-28, March, 2005.

J. Beutel, M. Dyer, M. Hinz, L. Meier and M. Ringwald: *Next-Generation Prototyping of Sensor Networks*. Proc. 2nd ACM Conf. Embedded Networked Sensor Systems (SenSys 2004), ACM Press, New York, pages 291-292, November, 2004.

J. Beutel, O. Kasten, F. Mattern, K. Römer, F. Siegemund and L. Thiele: *Prototyping Wireless Sensor Networks with BTnodes*. 1st European Workshop on Wireless Sensor Networks (EWSN 2004), Springer LNCS, vol. 2920, Berlin, pages 323-338, January 2004.

J. Beutel, O. Kasten and M. Ringwald: *BTnodes - A Distributed Platform for Sensor Nodes*. Proc. 1st ACM Conf. Embedded Networked Sensor Systems (SenSys 2003), ACM Press, New York, pages 292-293, November, 2003.

J. Beutel, O. Kasten and M. Ringwald: *BTnodes - Applications and Architecture Compared*. TKN Technical Report TKN-03-012, 1. GI/ITG KuVS Fachgespräch Sensornetze, TU Berlin, pages 34-46, July, 2003.

C. Plessl, R.ENZLER, H. Walder, J. Beutel, M. Platzner and L. Thiele. *Reconfigurable Hardware in Wearable Computing Nodes*. Proc. 6th Int'l Symp. Wearable Computers (ISWC2002). IEEE, Piscataway, NJ, pages 215-222, October 2002.

C. Savarese, J. Beutel and J.M. Rabaey. *Locationing in Distributed Ad-hoc Wireless Sensor Networks*. Proc. 2001 IEEE Int'l Conf. Acoustics, Speech and Signal Processing (ICASSP 2001), vol. 4. IEEE, Piscataway, NJ, pages 2037-2040, May 2001.

Tutorials

J. Beutel, P. Blum, M. Dyer and C. Moser: *BTnode Programming – An Introduction to BTnut Applications*. Computer Engineering and Networks Laboratory, ETH Zurich, 2005.

J. Beutel and S. Künzli: *The Moses Tool Suite – A Networking Tutorial*. Computer Engineering and Networks Laboratory, ETH Zurich, 2003.

Invited Seminar Talks

Artist Workshop on Basic Concepts of Mobile Embedded Systems, Vienna, Austria: *Deployment, Test and Validation of Sensor Networks*, December 2006

ETH Foundation, ETH Zurich: *Self-organizing Wireless Sensor Networks*, November 2006

University of Colorado Seminar, Boulder, CO: *Deployment and Validation of Sensor Network Applications*, November 2006

Siemens Switzerland Workshop, Zurich: *Fast-Prototyping of Wireless Sensor Networks*, June 2006

NCCR-MICS Industry Forum Panel – Infrastructures, EPF Lausanne: *Design and Validation - Critical steps on the way to real world sensor network applications*, May 2006

Siemens Building Technologies, Zug, Switzerland: *JAWS Deployment-Support Network*, April 2006

NCCR-MICS Samsung Workshop, ETH Zurich: *Design and Deployment of Wireless Networked Embedded Systems*, February 2006

TEC Software Engineering Workshop, ETH Zurich: *Documentation and Project Management*, December 2005

NCCR-MICS Seminar, ETH Zurich: *Why today's sensor networks do not sell...*, November 2005.

Berkeley Wireless Research Center Seminar, Berkeley, CA: *BTnodes – Design and Deployment of Wireless Networked Embedded Systems*, November 2005.

UCLA EE Department Seminar, Los Angeles, CA: *BTnodes – Design and Deployment of Wireless Networked Embedded Systems*, November 2005.

NCCR-MICS Fall Review, Löwenberg: *BTnodes – Designing a Sensor Network Platform*, September 2005.

Informationstage ETH Zurich: *Einführung in Sensornetzwerke*, September 2005.

NCCR-MICS Architecture Workshop, EPF Lausanne: *More than just a few chips – Building wireless sensor networks in 2005*, February 2005.

Summer School on Wireless Sensor Networks and Smart Objects, Schloss Dagstuhl: *Real-world Sensor Networks: Experiences in Design and Deployment*, March 2004.

C3 Seminar ETH Zurich: *Scaling it up – Networking with the BTnode Platform*, June 2004.

Siemens Switzerland Workshop, ETH Zurich: *Prototyping Wireless Sensor Network Applications with BTnodes*, April 2004.

ESF Exploratory Workshop on Wireless Sensor Networks, ETH Zurich: *Scaling it up – Networking with the BTnode Platform*, April 2004.

Wireless Sensor Network Seminar, Schloss Dagstuhl: *Robust Topology Discovery and Positioning Services using BTnodes*, March 2004.

NCCR-MICS Scientific Conference, Monte Verita: *Topology discovery and multihop networking using Bluetooth Smart Nodes*, October 2003.

Microsoft Research Academic Days – .NET mobile distributed and embedded technologies, Politecnico di Torino, Italy: *BTnodes – A Distributed Environment for Prototyping Ad Hoc Networks*, October 2003.

NCCR-MICS Annual Workshop, ETH Zurich: *BTnodes - A Distributed Platform for Sensor Nodes – Hard- and Software Architecture*, February 2003.

EPF Lausanne: *Bluetooth Smart Nodes for Ad-hoc Networks*, December 2002.

UbiComp Summer School, Schloss Dagstuhl: *Positioning in Ad-Hoc Networks*, August 2002.

MobiHoc 2002, EPF Lausanne: *Terminodes Bluetooth Ad-Hoc Testbed*, June 2002.

IKT Seminar, ETH Zurich: *Positioning in Ad-Hoc Networks – A Channel Model for Low Power Data Transmission*, June 2001.

References

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