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Internet of Things

Overview

Prof. Dr. Torsten Braun, Institut für Informatik

Bern, 22.02.2021

Internet of Things

Contact

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Lecture and Exercises

Lecture and Exercises

- Location: Zoom
- Date: Monday, 10:15 h
- PDF slides and A/V recordings available via ilias.unibe.ch
- Course registration via mcs.unibnf.ch/admin

Responsible Assistant

- Eric Samikwa
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eric.samikwa@inf.unibe.ch)

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Exam

- Date: Monday, June 14, 2021, time to be defined
- Location: Zoom or rooms to be defined
- Grading
 - 25 % exercises
 - 75 % exam
- Registration via mcs.unibnf.ch/admin

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Contents

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|------|-------------------------------|-------|-----------------------------|
| I. | Introduction and Applications | VII. | Medium Access Control |
| II. | Hardware Platforms | VIII. | Routing |
| III. | Operating Systems | IX. | Transport Protocols |
| IV. | Positioning and Localization | X. | Network Security |
| V. | Time Synchronization | XI. | Application Layer Protocols |
| VI. | Topology and Coverage Control | XII. | Network Architectures |

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Literature

- A. Hac: Wireless Sensor Network Designs, Wiley, 2003, ISBN 0-470-86736-1
- V. Lesser, C. Ortiz, M. Tambe (eds.): Distributed Sensor Networks, Kluwer, 2003, ISBN 1-4020-7499-9
- E. Callaway: Wireless Sensor Networks, Auerbach Publications, 2003, ISBN 0-8493-1823-8
- F. Zhao, L. Guibas: Wireless Sensor Networks, Morgan Kaufmann, 2004, ISBN 1-55860-914-8
- C. Raghavendra, K. Sivalingam, T. Znati: Wireless Sensor Networks, Kluwer, 2004, ISBN 1-4020-7883-8
- H. Karl, A. Willig: Protocols and Architectures for Wireless Sensor Networks, Wiley, 2005, ISBN 0-470-09510-5
- A. Stefanidis, S. Nittel: GeoSensor Networks, CRC Press, 2005, ISBN 0-415-32404-1
- S. Iyengar, R. Brooks (eds.): Distributed Sensor Networks, CRC Press, 2005, ISBN 1-58488-383-9
- M. Ilyas, I. Mahgoub: Handbook of Sensor Networks: Compact Wireless and Wired Sensing Systems, CRC Press, 2005, ISBN 0-8493-1968-4
- I. Akyildiz, M. Vuran: Wireless Sensor Networks, Wiley, 2010, ISBN 978-0-470-03601-3

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- I. Stojmenovic: Handbook of Sensor Networks, Wiley, 2005, ISBN 0-471-68472-4
- P. Santi: Topology Control in Wireless Ad Hoc and Sensor Networks, Wiley, 2005, ISBN 0-470-09453-2
- A. Boukerche: Handbook of Algorithms for Wireless Networking and Mobile Computing, Chapman & Hall, 2006, ISBN 1-58488-465-7
- R. Shorey, A. Ananda, M. Chan, W. Ooi: Mobile, Wireless, Sensor Networks, Wiley, 2006, ISBN 0-471-71816-5
- S. Phoha, Th. La Porta, Ch. Griffin: Sensor Network Operations, Wiley, 2006, ISBN 0-471-71976-5
- F. Dressler: Self-Organisation in Sensor and Actor Networks, Wiley, 2007, ISBN 978-0-470-02820-9
- S. Misra, I. Wougang, S. C. Misra (eds.): Guide to Wireless Sensor Networks, Springer, 2009, ISBN 978-1-84882-217-7
- A. Nayak, I. Stojmenovic: Wireless Sensor and Actuator Networks, Wiley, 2010, ISBN 978-0-470-17082-3
- A. Elahi, A. Gschwender: Zigbee Wireless Sensor and Control Network, Pearson, 2010, ISBN 978-0-13-713485-4

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- A. Xiao (ed.): Underwater Acoustic Sensor Networks, CRC Press, 2010, CRC Press, ISBN 978-1-4200-6711-8
- G. Ferrari (ed.): Sensor Networks, Springer, 2010, ISBN 978-3-642-01340-9
- F. Hu, X. Cao: Wireless Sensor Networks, CRC Press, 2010, ISBN 978-1-4200-9215-8
- Z. Shelby, C. Bormann: 6LowPAN: The Wireless Embedded Internet, 2009, Wiley, ISBN 978-0-470-74799-5
- J. Vasseur, A. Dunkels: Interconnecting Smart Objects with IP, Morgan Kaufmann, 2010, ISBN 978-0-12-375165-2
- H. Ammari (ed.): The Art of Wireless Sensor Networks, Vol. 1 and 2, Springer, 2014, ISBN 978-3-642-40008-7 / 978-3-642-40065-0
- C. Anton-Haro, M. Dohler (eds.): Machine-to-machine (M2M) Communications, Architecture, Performance and Applications, Elsevier, 2015
- Honbo Zhou: The Internet of Things in the Cloud: A Middleware Perspective, 2012, CRC Press
- J. Holler, V. Tsiatsis, C. Mulligan, S. Avesand, S. Karnouskos, D. Boyle: From Machine-to-Machine to the Internet of Things: Introduction to a New Age of Intelligence, Elsevier 2014

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E-Books

- <https://ebookcentral.proquest.com/lib/unibern/detail.action?dclid=3339972>
- <https://ebookcentral.proquest.com/lib/unibern/detail.action?dclid=4182905>
- <https://ebookcentral.proquest.com/lib/unibern/detail.action?dclid=666896>

Communication and Distributed Systems

Research Projects and Topics

- Machine Learning in Networking
 - Mobility Prediction
 - Indoor Localization
- Future Internet
 - Information-Centric Networking
 - Service Mobility
 - Recursive Internetwork Architecture
- Network Function Virtualization
 - Mobile Edge / Fog Computing

Thanks

for Your Attention

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