Dr. Philipp Vorst

Background

- 11/2006 - 04/2011: Research assistant at the Department of Cognitive Systems (former Dept. of Computer Architecture), University of Tübingen
- 10/2005 - 06/2006: Diploma thesis on "ReadyLog Agents for the RoboCup 3D Soccer Simulation League" (Knowledge-based Systems Group, RWTH Aachen University)
- 10/2000 - 06/2006: Study of computer science at RWTH Aachen University (Aachen, Germany)

Research Interests

- Self-localization, mapping, object localization, simultaneous localization and mapping (SLAM)
- RFID (radio-frequency identification) technology, positioning - especially with mobile robots
- Sensor fusion techniques

Project

- AmbiSense - Kooperation autonomer mobiler Systeme unter Berücksichtigung ambienter Sensoren

PhD Thesis

[1] Philipp Vorst. *Mapping, Localization, and Trajectory Estimation with Mobile Robots Using Long-Range Passive RFID*. PhD thesis, University of Tuebingen, Tübingen, Germany, August 2011. [link]

Publications

[1] Philipp Vorst, Artur Koch, and Andreas Zell. Efficient self-adjusting, similarity-based location fingerprinting with passive UHF RFID. In *IEEE International Conference on RFID-Technology and Applications (RFID-TA2011)*, pages 160--167, Sitges, Barcelona, Spain, September 15-16 2011. IEEE. [DOI]

[2] Ran Liu, Philipp Vorst, Artur Koch, and Andreas Zell. Path following for indoor robots with RFID received signal strength. In *The 19th International Conference on Software, Telecommunications and Computer Networks (SoftCOM 2011)*, Split, Hvar, and Dubrovnik, Croatia, September 2011. (Best paper award at the Symposium on RFID Technologies and Internet of Things).

[3] Timo Schairer, Benjamin Huhle, Philipp Vorst, Andreas Schilling, and Wolfgang Strasser. Visual mapping with uncertainty for correspondence-free localization using Gaussian process regression. In *Proceedings of the 2011 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS 2011)*, San Francisco, California, USA, September 2011. Accepted for publication.

[4] Philipp Vorst. *Mapping, Localization, and Trajectory Estimation with Mobile Robots Using Long-Range Passive RFID*. PhD thesis, University of Tuebingen, Tübingen, Germany, August 2011. [link]

[5] Marius Hofmeister, Philipp Vorst, and Andreas Zell. A comparison of efficient global image features for localizing small mobile robots. In *ISR/ROBOTIK 2010 (Proceedings of the joint conference of ISR 2010 (41st International Symposium on Robotics) and ROBOTIK 2010 (6th German Conference on Robotics))*, pages 143--150. VDE Verlag, June 2010.

[6] Philipp Vorst and Andreas Zell. A comparison of similarity measures for localization with passive RFID fingerprints. In *ISR/ROBOTIK 2010 (Proceedings of the joint conference of ISR 2010 (41st International Symposium on Robotics) and ROBOTIK 2010 (6th German Conference on Robotics))*, pages 354--361. VDE Verlag, June 2010.

[7] Philipp Vorst and Andreas Zell. Fully autonomous trajectory estimation with long-range passive RFID. In *2010 IEEE International Conference on Robotics and Automation (ICRA)*, pages 1867--1872, Anchorage, Alaska, USA, May 2010. IEEE. [DOI]

[8] Philipp Vorst and Andreas Zell. Particle filter-based trajectory estimation with passive UHF RFID fingerprints in unknown environments. In *Proceedings of the 2009 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS 2009)*, pages 395--401, St. Louis, Missouri, USA, October 2009. [DOI]

[9] Karsten Rohweder, Philipp Vorst, and Andreas Zell. Improved mapping of RFID tags by fusion with spatial structure. In Ivan Petrović and Achim J. Lilienthal, editors, *Proceedings of the 4th European Conference on Mobile Robots (ECMR 2009)*, pages 247--252, Mlini/Dubrovnik, Croatia, September 2009. KoREMA, Zagreb, Croatia.

[10] Philipp Vorst, Bin Yang, and Andreas Zell. Loop closure and trajectory estimation with long-range passive RFID in densely tagged environments. In *14th International Conference on Advanced Robotics (ICAR 2009)*, pages 1--6, Munich, Germany, June 22-26 2009.

[11] Philipp Vorst, Sebastian Schneegans, Bin Yang, and Andreas Zell. Self-localization with RFID snapshots in densely tagged environments. In *Proceedings of the 2008 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS 2008)*, pages 1353--1358, Nice, France, September 22-26 2008. [DOI]

[12] Timo Schairer, Christian Weiss, Philipp Vorst, Jürgen Sommer, Christian Hoene, Wolfgang Rosenstiel, Wolfgang Straßer, Andreas Zell, Georg Carle, Patrick Schneider, and Anette Weisbecker. Integrated scenario for machine-aided inventory using ambient sensors. In *4th European Workshop on RFID Systems and Technologies (RFID SysTech 2008)*, number 209 in ITG-Fachbericht, Freiburg, Germany, June 10-11 2008. VDE Verlag.

[13] Philipp Vorst, Jürgen Sommer, Christian Hoene, Patrick Schneider, Christian Weiss, Timo Schairer, Wolfgang Rosenstiel, Andreas Zell, and Georg Carle. Indoor positioning via three different RF technologies. In *4th European Workshop on RFID Systems and Technologies (RFID SysTech 2008)*, number 209 in ITG-Fachbericht, Freiburg, Germany, June 10-11 2008. VDE Verlag.

[14] Philipp Vorst and Andreas Zell. Semi-autonomous learning of an RFID sensor model for mobile robot self-localization. In Bruno Siciliano, Oussama Khatib, and Frans Groen, editors, *European Robotics Symposium 2008*, volume 44/2008 of *Springer Tracts in Advanced Robotics*, pages 273--282. Springer Berlin/Heidelberg, February 2008. [DOI]

[15] Sebastian Schneegans, Philipp Vorst, and Andreas Zell. Using RFID snapshots for mobile robot self-localization. In *Proceedings of the 3rd European Conference on Mobile Robots (ECMR 2007)*, pages 241--246, Freiburg, Germany, September 19-21 2007.

Diploma Thesis

ReadyLog Agents for the RoboCup 3D Soccer Simulation League
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[pdf] (external link, 3.8 MB)

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