

# Curriculum Vitae

## Personal Information

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Born on Dec. 16, 1974 in Freiburg, Germany



## Education

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- 2003 - 2007: PhD (Dr. rer. nat.) in Computer Science, University of Freiburg, Germany  
Title: "Three-dimensional Perception for Mobile Robots"
- 1998-2001: Diploma in Computer Science, University of Freiburg, Germany  
Title of master thesis (in German): "Erstellung von texturierten 3D-Umgebungsmodellen für mobile Roboter"
- 1997-1998: Diploma of Spanish as a Foreign Language in San Sebastian, Spain
- 1995-1997: Bachelor ("Vordiplom") in Computer Science, University of Freiburg, Germany
- 1991-1994: High-School in Freiburg, Germany

## Work Experience

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- since 2007: **Postdoctoral researcher** at Autonomous Systems Lab at **ETH Zurich**, headed by Prof. Roland Siegwart
- 2003 - 2006: **Research assistant** at Department of Computer Science at **University of Freiburg**, Group of Autonomous Intelligent Systems, headed by Prof. Wolfram Burgard
- 2002-2003: **Research assistant** at Department of Computer Science at **Carnegie Mellon University**, Pittsburg, Pennsylvania, USA in the group of Prof. Sebastian Thrun
- 2001-2002: **Research assistant** at Department of Computer Science at **University of Freiburg**, Group of Foundations of Artificial Intelligence, headed by Prof. Bernhard Nebel
- 1998-2001: **Student Assistant** at Department of Computer Science at **University of Freiburg**, Group of Pattern Recognition and Computer Vision, headed by Prof. Hans Burkhardt
- 1997-1998: **German teacher** in a private language school in San Sebastian, Spain
- 1996-1997: **Student Assistant** at Department of Computer Science at **University of Freiburg**, Group of Computer Architecture, headed by Prof. Bernd Becker

## Projects Involved

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- Since 2009: **EUROPA (European Robotic Pedestrian Assistant)**
- 2007-2010: **BACS (Bayesian Applications of Cognitive Systems).**
- 2005-2006: **ELROB (European Land Robot Event).** 3D mapping and autonomous car driving in collaboration with EPFL Lausanne, Switzerland
- 2003-2006: **Spatial Cognition – ThreeDSpace.** 3D mapping and scene interpretation in collaboration with University of Bremen, Germany
- 2002-2003: **Mine Mapping.** 3D mapping and navigation in underground mines

2001-2002: **CogViSys (Cognitive Vision System)**. Development of a description language for a cognitive vision system (participated only at the initial phase of the project)

## Awards

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2001: Diploma title with distinction ("mit Auszeichnung")  
2002: "LEG Förderpreis" – Award for outstanding master thesis  
2007: PhD title with distinction ("mit Auszeichnung")

## Special Skills

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Languages: English and Spanish, both fluent  
Programming: C/C++, MATLAB  
Software: CARMEN, VTK (3D visualization), CGAL, LaTeX,

## Publications

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### Journal Papers:

- R. Kümmerle, R. Triebel, P. Pfaff and W. Burgard "Monte Carlo localization in outdoor terrains using multilevel surface maps", *Journal of Field Robotics*, 2008
- Ó. Martínez Mozos, R. Triebel, P. Jensfelt, A. Rottmann, and W. Burgard "Supervised semantic labeling of places using information extracted from sensor data", *Journal on Robotics and Autonomous Systems (RAS)*, 2007
- P. Pfaff, R. Triebel and W. Burgard "An Efficient Extension to Elevation Maps for Outdoor Terrain Mapping and Loop Closing", *Int. Journal of Robotics Research (IJRR)*, Feb 2007
- H. Andreasson, R. Triebel and A. Lilienthal "Non-iterative Vision-based Interpolation of 3D Laser Scans", *Autonomous Robots and Agents, Studies in Computational Intelligence*, Springer-Verlag, 2007

### Conference Papers:

- J. Shin, R. Triebel, R. Siegwart, "Unsupervised Discovery of Repetitive Objects", in *Proc. of the International Conference on Robotics and Automation (ICRA) 2010*, to appear
- J. Maye, L. Spinello, R. Triebel, R. Siegwart, "Understanding Direction Signs in Public Places", in *Proc. of the International Conference on Robotics and Automation (ICRA) 2010*, to appear
- L. Spinello, A. Macho, R. Triebel, R. Siegwart, "Detecting Pedestrians at Very Small Scales" in *Proc. of the International Conference on Intelligent Robots and Systems (IROS)*, 2009
- L. Spinello, R. Triebel, R. Siegwart, "Multiclass Multimodal Detection and Tracking in Urban Environments" in *Proc. of Field and Service Robotics (FSR) 2009*
- D. Engel, L. Spinello, R. Triebel, C. Curio, R. Siegwart, H. Bülthoff, "Medial Features for Superpixel Segmentation", *Proc. of the IAPR Conf. on Machine Vision Applic. (MVA) 2009*
- L. Spinello, R. Triebel, and R. Siegwart "Multimodal Detection and Tracking of Pedestrians in Urban Environments with Explicit Ground Plane Extraction" In *Proc. of the Int. Conf. on Intell. Robots and Systems (IROS)*, 2008
- L. Spinello, R. Triebel, and R. Siegwart "Multimodal People Detection and Tracking in Crowded Scenes" In *Proc. of the Twenty-Third Conf. on Artificial Intelligence (AAAI)*, 2008
- R. Triebel, Ó. Martínez Mozos and W. Burgard "Collective Classification for Labeling of Places and Objects in 2D and 3D Range Data" In *Proc. of the 31th Annual Conference of the German Classification Society on Data Analysis, Machine Learning, and Applic.*, 2007

- R. Kümmerle, P. Pfaff, R. Triebel and W. Burgard "Active Monte Carlo Localization in Outdoor Terrains using Multi-Level Surface Maps" In: Fachgespräche Autonome Mobile Systeme (AMS), Kaiserslautern, Germany, 2007
- R. Triebel and W. Burgard "Recovering the Shape of Objects in 3D Point Clouds with Partial Occlusions" In Proc. of the 6th International Conference on Field and Service Robotics (FSR), 2007
- R. Kümmerle, R. Triebel, P. Pfaff, and W. Burgard "Monte Carlo Localization in Outdoor Terrains using Multi-Level Surface Maps" In Proc. of the 6th International Conference on Field and Service Robotics (FSR), 2007
- P. Pfaff, R. Triebel, C. Stachniss, P. Lamon, W. Burgard, and R. Siegwart "Towards Mapping of Cities" In Proc. of the International Conference on Robotics and Automation(ICRA), 2007
- R. Triebel, R. Schmidt, Ó. Martínez Mozos, and W. Burgard "Instance-based AMN Classification for Improved Object Recognition in 2D and 3D Laser Range Data" , In Proc. of the International Joint Conference on Artificial Intelligence (IJCAI), 2007
- R. Triebel, P. Pfaff, and W. Burgard "Multi-Level Surface Maps for Outdoor Terrain Mapping and Loop Closing" In Proc. of the International Conference on Intelligent Robots and Systems(IROS), 2006
- R. Triebel, K. Kersting, and W. Burgard " Robust 3D Scan Point Classification using Associative Markov Networks" In Proc. of the International Conference on Robotics and Automation(ICRA), 2006
- H. Andreasson, R. Triebel, and A. Lilienthal "Vision-based Interpolation of 3D Laser Scans" In Proc. International Conference on Auton. Robots and Agents (ICARA), 2006
- H. Andreasson, R. Triebel, and W. Burgard "Improving Plane Extraction from 3D Data by Fusing Laser Data and Vision" In Proc. of the International Conference on Intelligent Robots and Systems(IROS), 2005
- R. Triebel and W. Burgard "Improving Simultaneous Localization and Mapping in 3D Using Global Constraints" In Proc. of the Twentieth National Conference on Artificial Intelligence (AAAI), 2005
- R. Triebel, W. Burgard, and F. Dellaert "Using Hierarchical EM to Extract Planes from 3D Range Scans". In Proc. of the IEEE International Conference on Robotics and Automation (ICRA), 2005
- R. Triebel, B. Frank, J. Meyer, and W. Burgard "First steps towards a robotic system for flexible volumetric mapping of indoor environments". In Proc. of the 5th IFAC/EURON Symposium on Intelligent Autonomous Vehicles (IAV), 2004.
- S. Thrun, D. Hähnel, D. Ferguson, M. Montemerlo, R. Triebel, W. Burgard, C. Baker, Z. Omohundro, S. Thayer, and W. Whittaker "A system for volumetric robotic mapping of underground mines". In Proc. of the IEEE International Conference on Robotics and Automation (ICRA), 2003.
- D. Hähnel, R. Triebel, W. Burgard, and S. Thrun. "Map Building with Mobile Robots in Dynamic Environments". In Proc. of the IEEE International Conference on Robotics and Automation (ICRA), 2003

#### **Workshop Papers:**

- P. Pfaff, R Kümmerle, D. Joho, C. Stachniss, R. Triebel and W. Burgard: "Navigation in Combined Outdoor and Indoor Environments using Multi-Level Surface Maps" In Workshop on Safe Navigation in Open and Dynamic Environments at IEEE International Conference on Robotics and Automation (ICRA), San Diego, CA, USA, 2007
- Pierre Lamon, Cyrill Stachniss, Rudolph Triebel, Patrick Pfaff, Christian Plagemann, Giorgio Grisetti, Sascha Kolski, Wolfram Burgard, Roland Siegwart "Mapping with an Autonomous Car" In Proc of the Workshop on Safe Navigation in Open and Dynamic Environments, IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), Beijing, China, 2006
- Óscar Martínez Mozos, Axel Rottmann, Rudolph Triebel, Patric Jensfelt and Wolfram Burgard. Semantic Labeling of Places using Information Extracted from Laser and Vision Sensor Data. In Proc. of the IEEE/RSJ IROS 2006 Workshop: From Sensors to Human Spatial Concepts (IROS). Beijing, China, 2006

#### **Technical Reports:**

- Pierre Lamon, Sascha Kolski, Rudolph Triebel, Roland Siegwart, Wolfram Burgard "The SmartTer for ELROB 2006 - a Vehicle for Fully Autonomous Navigation and Mapping in Outdoor Environments"
- Wolfram Burgard, Reinhard Moratz, Thomas Röfer, Rudolph Triebel, Michael Wüstel "Intermediate Report Project A2-[ThreeDSpace]"

**Theses:**

- Rudolph Triebel, "*Three-dimensional Perception for Mobile Robots*", 2007, PhD thesis
- Rudolph Triebel, "*Erstellung von texturierten 3D-Umgebungsmodellen für mobile Roboter*", 2001, Master's thesis (in German)
- Rudolph Triebel, "*Automatische Erkennung von handgeschriebenen Worten mithilfe des Level-building Algorithmus*", 1999, semester project (in German)