

1. Curriculum Vitae

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Name:	Roland Y. Siegwart
Nationality:	Swiss
Date of birth:	May 2, 1959, Switzerland
Marital status:	Married, three children
Address:	Autonomous Systems Lab Institute of Robotics and Intelligent Systems ETH Zurich 8092 Zurich, Switzerland http://www.asl.ethz.ch mailto:rsiegwart@ethz.ch

1.1. Education

- 8/1989 PhD in Mechanical Engineering, ETH Zurich, with distinction Silver Medal ETH
Thesis No. 8962 ETH: *Electro-magnetically Suspended Milling Spindle with Active Digital Control*,
Referent: Prof. Dr. G. Schweitzer, Co-Referent: Prof. Dr. J. Hugel.
- 1/1984 Master in Mechanical Engineering, Swiss Federal Institute of Technology, ETH Zurich.
- 6/1979 Baccalaureate (Matura) type C, Schwyz

1.2. Professional Career

- 2006 - **Full Professor for Autonomous Systems, Swiss Federal Institute of Technology Zurich (ETH)**
- Director of the Autonomous System Lab (ASL) with, around 6 Postdocs, 25 doctoral students and 10 technical and administrative collaborators.
- 2005 **Visiting Professor at NASA Ames and Stanford University (4 month)**
- 2002-06 **Vice Dean, School of Engineering (STI), EPFL**
- 1996-06 **Full Professor in Microengineering Swiss Federal Institute of Technology Lausanne (EPFL).**
- Director of the Autonomous System Lab (ASL)
- 1990-97 **Vice-president R&D, MECOS Traxler AG (part time).**
- Development and implementation of active magnetic bearings for machine tools, turbo compressors, ultra vacuum technology, textile spindles and various other applications.
- 1990-96 **Deputy Head and Lecturer, Institute of Robotics, ETH Zurich (part time).**
- Initiator and leader of various projects in robotics and mechatronics.
 - Nano Robot: Co-initiator of the interdisciplinary Polyproject 'Nano Roboter'. Leader of the activities in nano-robotics at the Institute of Robotics.
 - Initiator and lecturer of 'Bau intelligenter Mechatronikprodukte', a new type of lecture with special emphasis on 'hands on' experience and system design.
- 1989-90 **Postdoc at Center of Design and Research (CDR), Stanford University, California, USA.**
- Research activities in the field of product design, micro-robotics, tactile gripping and solar car design.
- 1985-89 **Research and teaching assistant, Institute of Mechanics (Prof. Schweitzer), ETH.**
- 1985-86 **Lecturer for turbomachinery, Technical University (HTL), Zurich.**
- 1984-85 **Research and teaching assistant, Turbomachinery Lab (Prof. Gyarmathy), ETH Zurich.**

1.3. Primary Research Interest

- Mobile Robot design and navigation - Localization and mapping, planning in dynamic environments, human robot interaction, locomotion concepts for rough terrain, mobile micro-robots, space rovers, autonomous cars and unmanned aerial vehicles.
- Mechatronics Design and Systems Engineering (smart product design, innovation, creativity).
- Artificial Cognitive Systems (Perception, representations, probabilistic reasoning and planning)

Please visit <http://www.asl.ethz.ch> for details on my research activities

1.4. Other Professional Activities

Professional Services within University

- Director of Studies, Department of Mechanical and Process Engineering, 2007-2009
- Chairman and founding member of the Space Center EPFL, 2004 – 2006
- EPFL delegate, Foundation of the IDIAP Research Institute, Martigny, 2003 – 2005
- Tenure Committee EPFL, 2002 – 2006
- Research Commission, EPFL 2001 – 2002
- Advisor of over 30 PhD students 2006 -

Editorial Boards, Professional Associations and Committees

Editorial and Management Boards of Journals

- Springer STAR Series, Springer Tracts in Advanced Robotics, 2008 -
- Editors-in-Chief, Foundations and Trends in Robotics, now publishers, 2008 –
- IEEE/ASME Transaction on Mechatronics, Management Committee 2008 -
- Advisory Board, Journal "Advanced Robotics" Robotics Society of Japan (RSJ), 2007 –
- Editor, Journal of Intelligent and Robotic Systems, 2007 -
- Associate Editor, Journal of Field Robotics, 2005 –
- Associate Editor, Journal Intelligent Service Robotics, 2005 -
- Editor Board, Journals in Micromechatronics 2000 -

Professional Associations and Important Committees

- Member of the Research Council of the Swiss National Science Foundation, 2009 -
- International Foundation of Robotics Research (IFRR): Board of Officers, 2007 –
- Robotics Science and Systems, Advisory Board Member, 2005 -
- IEEE Robotics and Automation Society: AdCom Member 2007 - 2009
- Member of "Bewilligungsausschusses Exzellenzinitiative" of the DFG (Deutsche Forschungsgemeinschaft), 2006-08
- Deputy Head, National Competence Center for Research (NCCR) on Multimodal Information Management (IM2), 2003 – 2006
- IEEE Robotics and Automation Society: Vice President for Technical Activities, 2004 - 2005
- Advisory board of the European Robotics Network (EURON), 2001 - present
- Advisory Group for Automation and Robotics (AGAR), European Space Agency (ESA), 1998 - present
- Peer Leader for Mechatronics, Swiss Peer Review of the Universities of Applied Science, 2001 - 2003

Organization of International Conferences and Workshops (Key Positions)

- General Chair, International Symposium on Robotics Research, ISRR, Luzern, Switzerland, August 31 to September 3, 2008
- Local Organizing Chair, Robotics: Science and Systems Conference, ETH Zurich, June 25-28, 2008
- Co-Chair, Workshop "Micro Aerial Vehicles: Design, Control and Navigation" 2007 IEEE/RSJ International Conference on Intelligent Robots and Systems, San Diego, November 2, 2007
- General Co-Chair, Field and Service Robotics Conference, FSR 2007, Chamonix, June 2007
- General Chair, IEEE/ASME International Conference of Advanced Intelligent Mechatronics, AIM 2007, ETH Zurich, September 2007
- Co-Chair, Bayesian Cognition workshop, Paris, January, 2006
- Co-Chair, Advanced Intelligent Mechatronics AIM 2005, Monterey, July 2005
- Area Program Co-Chair, IEEE International Conference on Robotics and Automation, ICRA 2005, Barcelona, April 2005
- General Co-Chair of LEURRE Workshop 'From Solitary Animal to Social Robots', at the 8th Conference on Intelligent Autonomous Systems (IAS 8), March 11, 2004
- Program Co-Chair of the 2003 IEEE International Conference on Humanoids, Karlsruhe, Germany, October 1-3, 2003
- General Chair of the 2002 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), EPFL Lausanne, September 30 - October 5, 2002
- Program Chair of The Fourth European Workshop on Advanced Mobile Robots (EUROBOT'01), Lund Sweden, September 19-21, 2001
- Program Chair of The Seventh International Symposium on Magnetic Bearings, ETH Zurich, August 23-25, 2000
- Chairman of Workshop 'Mobile Micro-Robots', IEEE International Conference on Robotics and Automation (ICRA), San Francisco, USA, April 24-28, 2000
- Program Chair of The Fourth International Conference on Motion and Vibration Control, MOVIC'98, ETH Zurich, August 25-28, 1998
- Program Chair of The Forth International Symposium on Magnetic Bearings, ETH Zurich, August 24-26, 1994

1.5. Honors, Distinctions, Awards

Personal

- Elevation to IEEE Fellow, 2008
- Board of Officers, International Foundation of Robotics Research (IFRR), 2007 - (on appointment)
- Honorary Professor of the Swiss Federal Institute of Technology Lausanne (EPFL), 2006
- Member of Final Approval Committee of the German Excellence Initiative of the German Science Foundation of the DFG, 2006-07 (on appointment)
- Member of the Swiss Academy of Engineering Sciences, 2006 (on appointment)
- Distinguished Lecturer, IEEE Robotics and Automation, 2006-07
- Silver Medal (highest distinction), PhD thesis ETHZ
- Postdoctoral scholarship of the Swiss Science Foundation, 1989-90

Work of my Research Group (non exhaustive)

- Hans-Eggenberger-Preis 2009, Marco Hutter
- ThesisClawar 2009 best paper award, Wolfgang Fischer et. al.
- Robotdalen Scientific Award 2009, highest distinction for robotics PhD research in Europe, Davide Scaramuzza
- Willi Studer Award, highest distinction for Master Students at ETH, Marco Hutter
- EURON 2009 best PhD award, Dizan Vasquez
- 2008 Early Government/Industry Career Award in Robotics and Automation, IEEE Robotics and Automation Society, Nicola Tomatis
- EURON 2008 best PhD award finalist, Samir Bouabdallah
- AIM 2007, best paper finalist, Fabien Tache et. al
- EURON 2007 best PhD award, Pierre Lamon
- EURON 2004 best PhD award finalist, Kai Arras
- Latsis Foundation award, highest distinction in research in Switzerland, Francesco Mondada
- Field and Service Robotics Conference (FSR), best paper award, Australia, 2005, Andre Noth et al.
- AMiRE 2003 best paper award, Gilles Caprari et al.

1.6. Innovation Awards

- Dyson Innovation Award 2008 for SUIP- Student Projekt 2006/7 „ExtHanded: Innovative Kameraführung“, Maria Tarcsay, Marco Stoffel, Christian Looser
- Attribution of the label 'KTI-Start-up' for our spin-off company BlueBotics SA, 2008
- Winner 'Technologiestandort Schweiz', Mobile Field and Service Robots, 2001
- Attribution of the label 'KTI-Start-up' for our spin-off company Shockfish SA, 2000
- Winner 'Technologiestandort Schweiz', Squeeze Film Air-Bearings, 2000

1.7. Main Spin-Offs & Start-ups

- *Skybotix*, founded in Spring 2009
- *ALSTOM Inspection Robotics*, founded in Fall 2006, 10 collaborators
- *BlueBotics* Ltd, founded in February 2001, 10 collaborators. BlueBotics is developing and realizing mobile robots for service applications.
- *Shockfish* Communication Ltd, founded in September 1999, around 10 collaborators. Shockfish is developing, producing and installing conference navigation systems.
- *MECOS* Traxler Ltd, founded in 1988, around 30 collaborators. MECOS is a leading company in the field of active magnetic bearings.

2. Projects (since 1997)

2.1. EPFL/ETH Research Grants (Total project volume of around 1 Mio sFr.)

- ETH, FILEP, *CAD Abstrakt – Konkret*, 2007
- Univ. of Lausanne - Swiss Federal Institute of Technology (Lausanne) Collaborative Research Projects, *Evolution of cooperation and Labour Division in Artificial Ants* with Dario Floreano and Laurent Keller, 2001
- EPFL research project, *Autonomous Micro-Robots for Space Exploration*, 2001-03
- EPFL research project, *Interactive Mobile Robots (Personal Robots)*, with P. Fua, EPFL, 2001-04
- CEPF, New Learning Technologies, *Hands-On Mechatronics Education*, 2000-03
- Exchange program ETHZ - EPFL for doctoral students, *Hybrid Topological and Metric Maps for Mobile Robot Navigation*, 1998-2001
- Exchange program ETHZ - EPFL for doctoral students, *Squeeze-Film Bearings*, 1997-2000

2.2. National Science Foundation and other Governmental Contracts (Total project volume of around 2 Mio sFr.)

- SNF, No. 200021-125017, *Autonomous vision-based micro-helicopter*, with M. Pollefeys, 2009-2011
- SNF, No. 200021-119965, *Dynamic Locomotion with Quadrupeds - Energy Efficient Locomotion by Exploiting Passive Dynamics*, 2009-2011
- BfE, *Mobility through Communication, Computation and Control (MC3): Novel concepts for highly fuel efficient and lightweight cars with active security through perception and communication*, ETH IMRT and EPFL, 2008-2011
- SNF - National Center of Competences in Research (NCCR) on *Interactive Multimodal Information Management (IM2)*, with IDIAP (Project leader), EPFL, University of Geneva, University of Freiburg, University of Bern, ETH Zürich, 2002-09
- SNF, No. 200020-112152 / 200021-101886, *Multisensor Fusion for Mobile Robot Simultaneous Localization, Mapping and Odometry Calibration*, 2003-08
- SNF, No. 31523A-100476, *Evolution of cooperation and division of labour in artificial ants*, with L. Keller and D. Floreano, 2003-07
- SNF, No 2100-059236 *Intelligent Voice Enabled Interfaces for Human Guided Mobile Robots*, with A. Drygajlo EPFL, 2001-03
- SNF, No 5003-51366, Priority Program SPP IuK, *Mobile Robot on the Web: Interactive exploration of distant places*, with LAMI (EPFL), Ecole cantonale d'art de Lausanne, K-Team SA, various industrial partners, 1998-2000
- SNF Fellowship, No. 81EZ-026757 *Aufbau und Inbetriebnahme eines fehlertoleranten, auf Vision basierenden Navigationssystemes für einen mobilen Roboter*, 1989-1990

2.3. European (Total project volume of around 15 Mio sFr., coordinator of sFly, muFly and BACS)

- EU IP, No. FP7 - 247870 *Natural human-robot cooperation in dynamic environments (NIFTI)*, Deutsches Forschungszentrum für Künstliche Intelligenz GmbH, Fraunhofer Institut Intelligente Analyse- und Informationssysteme, BlueBotics SA Switzerland, Czech Technical University Prague, Sapienza' University of Roma, 2010 - 2014
- EU STREP, No. FP7 – 248669, Innovative aerial service robots for remote inspections by contact (*AiRobots*), Università di Bologna (coordinator), Alstom Inspection Robotics, Università di Napoli UNINA, University of Twente, February 2010 – January 2013
- EU STREP, No. FP7 – 231888, *European Robotic Pedestrian Assistant (EUROPA)*, Albert Ludwigs Universität Freiburg, Germany, ETH Zürich, Switzerland, Katholieke Universiteit Leuven, Belgium, University of Oxford, United Kingdom, BlueBotics, Switzerland, May 2009 – April 2012
- EU STREP, No. FP7 – 231855, *Swarm of Micro Flying Robots (sFly)*, ETH Zürich (coordinator), Technical University of Crete TUC Greece, INRIA Grenoble, CSEM Switzerland, Ascending Technologies GmbH, January 2009 - December 2011
- EU STREP, No. FP6 – 045350, *An open Platform for Home Robotics (Robots@home)*, Technische Universität Wien (coordinator), BlueBotics SA, ARC Seibersdorf research GmbH, Eidgenössische Technische Hochschule Zürich, Legrand SA Michel Teissier, Nestlé Nespresso SA, Otto Bock HealthCare GmbH, May 2007 - April 2010
- EU STREP, No. FP6 – 045062, *Ubiquitous Networking Robotics in Urban Settings (URUS)*, Technical University of Catalonia Spain (coordinator), LAAS CNRS France, ETH Zurich Switzerland, Asociación de Investigación y Cooperación Industrial de Andalucía Spain, Scuola Superiore di Studi Universitari e di Perfezionamento Sant'Anna Italy, Universidad de Zaragoza Spain, Instituto Superior Técnico, Portugal, University of Surrey U.K., Urban Ecology Agency of Barcelona Spain, Telefónica Spain, RoboTech Italy, December 2006 – December 2009
- EU STREP No. FP6 - 034120, *Fully Autonomous Micro-Helicopter (muFly)*, ETHZ coordinator, with Technische Universität Berlin, Swiss Center for Electronics and Microtechnology (CSEM) Switzerland, CEDRAT Technologies France, Albert-Ludwigs-University of Freiburg Germany, Xsens Technologies The Netherlands, 2006-09
- EU IP No. FP6- 027140, *Bayesian Approach to Cognitive Systems (BACS)*, ETHZ coordinator, with INRIA Grenoble, Collège de France Paris, Ecole Normale Supérieure Paris, Max-Planck Tuebingen, IDIAP Martigny, University Hospital

Geneva, University of Coimbra, PROBAYES SA France, BLUEBOTICS SA Lausanne and Electricite de France (EDF) Paris, 2006-10

- EU STREP No. FP6-507859, *Secure Propulsion using Advanced Redundant Control (SPARC)*, with DaimlerChrysler AG and various other scientific and industrial partners, 2004-07
- EU IP No. FP6-002020, *The Cognitive Robot Companion (COGNIRON)*, with CNRS- LAAS (leader), University of Bielefeld, EPFL Lausanne, University of Hertfordshire, Fraunhofer IPA, University of Karlsruhe, Royal Institute of Technology, Vrije Universiteit Brussel, 2004-08
- EU NoE No. IST-507728 Network Program, *European Robotics Network (EURON II)*, 2004-08
- EU No. GRD1-CT-2001-00625, *Magnetic Bearings for Smart Aero Engines (MagFly)*, with MTU Germany, Turbomeca France, Mecos Traxler Switzerland, The Barden Corporation UK, Samtech Belgium, Imperial College UK, Darmstadt University of Technology, Technion Israel, 2002-06
- EU No. IST-2001-37170, *Real Time Embedded Control of Mobile Systems with Distributed Sensors (RECSYS)*, with University of Pisa, KTH Stockholm, University of Pisa, Interco Hrt S.p.A, 2002-05
- EU No. IST-2001-35506, *Artificial Life Control in Mixed-Societies (LEURRE)*, with Université Libre de Bruxelles, International Solvay Institutes, CNRS-Rennes, Université Paul Sabatier Toulouse, Université de Rennes, 2002-06
- EU No. IST-2001-32115, *Bayesian Inspired Brains and Artefacts: Using probabilistic logic to understand brain function and implement life-like behavioural co-ordination (BIBA)*, with INRIA Grenoble, University College London, CNRS/College de France Paris, MIT Boston, 2001-05
- Network Program, *European Robotics Network (EURON I)*, 2000-03

2.4. European Space Agency (ESA) (Total project volume of around 2 Mio sFr.)

- EUROBOT, Program Rover Platform System, with GMV Aerospace and Defence SA; E-28760 Tres Cantos (Madrid) 2008 -
- ExoMars Rover Vehicle - Locomotion Sub System, with RUAG Aerospace, 2008 -
- ESA Lunar Rover Competition, 2008
- ESA/ESTEC, Contract No: 18792/04/NL/JD, *Compact Digital Processing Unit (CDPU)*, with Syderal AG (Prime), 2005-06
- ESA/ESTEC, Contract No: 18191/04/NL/PM, *Mars Rover Chassis*, with Contraves Space AG (Prime), Surrey University, DLR Köln and EADS-ST, 2004-06
- ESA/ESTEC, Contract No: 17960/03/NL/VS, *ExoMars Rover and Pasteur Payload Study*, with EADS Astrium (Prime), vH&S, DLR, SCISYS, IPAC, Galileo Avionica, CNRS-LAAS, University of Surrey, 2003-05
- ESA/ESTEC, Contract No: 17602/03/NL/PA, *StarTiger III Definition Study Solar Powered Airplane for Mars*, 2003-06
- ESA/ESTEC, Contract No: MRP, 16882/02/NL/Sfe, *Mercury Robotic Payload*, with von Hoerner & Sulger GmbH, Mecanex S.A, DLR Oberpfaffenhofen, 2003-04
- ESA/ESTEC, Contract No: 15776/01/NL/PA, *Solar-powered Exploration Rover (SOLERO)* with, von Hoerner & Sulger GmbH, 2002-03
- ESA/ESTEC, CCN1 to contract No. 12052/96/NL/JG(SC), *Nanokhod Engineering Model for Test on Environmental Compatibility*, with von Hoerner & Sulger GmbH, Mecanex S.A, DLR Oberpfaffenhofen, 2000-02
- ESA/ESTEC, No. 13622/99/NL/WK, *Micro-Robots: Components and Control*, with Astrium AG., Mecanex S.A., IMM Mainz, 1999-2001
- ESA/ESTEC, No. 12052/96/NL/JG(SC), *Mobile Robots for Space Exploration*, with Mecanex Nyon, von Hoerner & Sulger GmbH, Max- Plank-Institute Mainz, DLR Köln, DLR Oberpfaffenhofen, 1997-99

2.5. Industry CTI (Total project volume of around 2 Mio sFr.)

- CTI No. 10644.1, *Vernetzung von realer und digitaler Welt: Weiterentwicklung der Basistechnologie einer innovativen Scan-Lösung hin zum Proof of Concept*, with Dacuda AG, 2009 - 2010
- CTI No. 8435.1, *Highly Compact Robots for Power Plant Inspections*, with Astom and EPFL, 2006-2009
- CTI No. 5494.1 SUS, *Mobile Robot for Automated Marking of Exposition Halls*, with Palexpo Geneva and BlueBotics, 2001-03
- CTI No 4657.1; *Robot mobile pour l'inspection et diagnostique des réseaux de ventilation (aéraulique)*, Sedirep, K-Team, 2000-01
- CTI No 4166.1, *Adaption du design des paliers aux caractéristiques de l'application pour les très hautes vitesses*, with EPFL-DM (Pahud), RMB SA, 1998-99
- CTI No 4408.1, *SpotMe!, an Autonomous Short- Range Communication System* 1998-99
- MINAST 6.5, *Electronic Development for Smoovy*, with LEME (EPFL), IMS (EPFL), IFM (ETHZ), RMB SA. 1998-00
- CTI No 3223.1; *Schnelles Feinpositionierungs-System für Montage-Aufgaben*, ESEC SA, Cham, 1997-2001
- MINAST 6.1 (Artist), *High-Precision Pick and Place*, with EPFL-ISR, ESEC SA., SYSMELEC SA., ZEVATECH AG, AGIE SA., 1996-2000

2.6. Industry Mandates and Other (Total project volume of around 2 Mio sFr.)

- vZug, smart washing systems, 2008 -
- Volkswagen, Intelligent Systems in and around future cars, 2008 -
- Disney Center Zurich, Robots for Edutainment, 2008 -
- StratXX, High altitude Balloon technology, 2005-2006
- GTT (Gaztransport et Technigaz S.A.), Design of Conceptual Prototype of Gas-Tank Inspection Robot, 2006-07
- Alstom, Miniature Inspection Robots, 2005-07
- NASA Ames, *Development of Antarctica Exploration Rover Prototype*, 2005-06
- "Robots", A theater project with three robots and two comedians, 2004-05
- Sauber Petronas F1 cars, 2004
- EXPO.02, Projet No 8.312.01.02. *Robotics*, 2001-02
- CSEM Alpnach, *3D Mapping with Mobile Robots*, 2001-06
- EXPO.02, Avant-projet No 8.312.01.02. *Robotics*, 2000-01
- Study and proposal for ESA, *Solar Highspeed Rover with Innovative Mobility Performance*, Helbling Ingenieurunternehmung AG, 2000
- Visiting Researcher from NTT, *Investigation of mechanical energy supplies for microsystems*, NTT, Tokyo, Kunitoshi Tazume, 1999-2000
- *Squeeze Film Bearings*, PM°DM SA., Study projects with PM°DM GmbH, 1997-98