

Gilles Caprari
Dr. sc. techn. EPFL, Dipl. Ing. ETHZ
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CH-6900 Lugano



PERSONAL DATA

Date and place of birth: 24th September 1972, Locarno, Switzerland
Nationality: Swiss
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CORE COMPETENCES

- Mechatronics systems integration and miniaturization
- Product development and project management
- Miniature, autonomous and low-power robotics
- Mobile robotics

WORK EXPERIENCE

Nov. 2006 – 2010 Autonomous Systems Lab, ETH Zurich, Switzerland
Project Leader
• CTI applied research project: Inspection Robots for Power Plants

Since February 2009 Skybotix, Innovative Micro Aerial Vehicles, Zurich, Switzerland
Founder and CTO

Since November 2005 GCtronic, Electronics & Mechatronics, Lugano, Switzerland
Founder and Director
• Development and consulting
• Production, sale and support of mobile robots

May 2003 – October 2005 Autonomous Systems Lab, EPFL, Lausanne, Switzerland
Senior researcher
• European project LEURRE: Artificial Life Control in Mixed-Societies
• Swiss project ANT: Evolution of Cooperation in Artificial Ants

Dec. 1997 - April 2003 Autonomous Systems Lab, EPFL, Lausanne, Switzerland
Research Assistant and Doctoral Student
• Thesis: Autonomous Micro-Robots: Applications and Limitations

Nov. 1996 - Nov. 1997 Institute of Robotics; Automatic Control Lab; Institute of Machine Tools and Manufacturing, ETH Zurich, Switzerland
Research Assistant

Summer 1994 Systems West, Inc., Carmel Valley, California, USA
Summer Internship

EDUCATION

Dec. 1997 – April 2003 Autonomous Systems Lab, EPFL, Lausanne, Switzerland
Dr. sc. techn. EPFL

Oct. 1991 – Oct 1996 Abteilung Elektrotechnik, ETH Zurich, Switzerland
Degree of Electrotechnical engineering ETHZ
Diploma thesis: Flexibler Mobiler MiniRoboter

Sept. 1987 – June 1991 Secondary Education: Liceo Scientifico, Locarno, Switzerland

TEACHING EXPERIENCE

- Lecture Assistant: Mobile Robotics
- Project Supervisor: 4 diploma theses, 23 semester projects
- Practical exercises of robotics

SOFTWARE SKILLS

- Programming: C, C++, Assembler
- Software tools: Protel, Matlab, ProEngineer, SolidWorks
- Operating Systems: Windows, Linux

LANGUAGES

- Fluently, written, spoken: Italian, French, German, English

HOBBIES

- Sailing, paragliding and traveling

Awards

- EURON/EUROP Technology Transfer Award 2010, first price
- Best paper award at AMiRE'03, Brisbane.
- Winner of the Micro Robot Contest 1999 and 2000, Category 2: autonomous robots. Nagoya, Japan.

List of Publications

Journals

- W. Fischer, G. Caprari, R. Siegwart, R. Moser (2010) Robotic crawler at very low height with axial and circumferential mobility - for inspecting generators with the rotor still installed. TIE
- F. Tache, W. Fischer, G. Caprari, R. Moser, F. Mondada, R. Siegwart (2009) Magnebike: A Magnetic Wheeled Robot with High Mobility for Inspecting Complex Shaped Structures, Journal of Field Robotics, Vol. 26, May 2009, 453-476.
- S. Garnier, C. Jost, R. Jeanson, J. Gautrais, A. Grimal, M. Asadpour, G. Caprari, G. Theraulaz (2008) The Embodiment of Cockroach Aggregation Behavior in a Group of Micro-robots, Artificial Life
- J. Halloy, G. Sempo, G. Caprari, C. Rivault, M. Asadpour, F. Tache, I. Said, V. Durier, S. Canonge, J. Ame, C. Detrain, N. Correll, A. Martinoli, F. Mondada, R. Siegwart, J. Deneubourg (2007) Social Integration of Robots into Groups of Cockroaches to Control Self-Organized Choices. Science, Vol. 318, November 2007, 1155-1158
- M. Asadpour, F. Tache, G. Caprari, W. Karlen, R. Siegwart (2006) Robot-Animal Interaction: Perception and Behavior of InsBot. Int. Journal of Advanced Robotic Systems. Vol. 3, No. 2, pp 93-98.
- G. Caprari, A. Colot, R. Siegwart, J. Halloy, J.-L. Deneubourg (2005) Animal and Robot Mixed Societies - Building Cooperation Between Microrobots and Cockroaches. IEEE Robotics & Automation Magazine. Vol.12, No. 2, June, pp 58-65.
- S. Garnier, C. Jost, R. Jeanson, J. Gautrais, M. Asadpour, G. Caprari, G. Theraulaz (2005) Aggregation Behaviour as a Source of Collective Decision in a Group of Cockroach-like Robots. Lecture Notes in Artificial Intelligence, Vol. 3630, September 2005, 169-178.
- G. Caprari, T. Estier, R. Siegwart (2002) Fascination of Down Scaling - Alice the Sugar Cube Robot. Journal of Micro-Mechatronics, VSP, Utrecht, Vol. 1, No. 3, 177-189.

Peer-reviewed Proceedings

- A. Breitenmoser, F. Tache, G. Caprari, R. Siegwart, R. Moser (2010) MagneBike - Toward multi climbing robots for power plant inspection. Proc. of the 9th International Conference on Autonomous Agents and Multiagent Systems (AAMAS), May 2010.
- W. Fischer, G. Caprari, R. Siegwart, R. Moser (2009) Foldable Magnetic Wheeled Climbing Robot for the Inspection of Gas Turbines. CLAWAR 2009, Winner of the Industrial-Robot Innovation award 2009
- W. Fischer, G. Caprari, R. Siegwart, R. Moser (2009) Robotic Crawler for Inspecting Generators with Very Narrow Air Gaps. Proc. of The 5th IEEE International Conference on Mechatronics (ICM)
- L. Kneip, F. Tache, C. Caprari, R. Siegwart (2009) Characterization of the compact Hokuyo URG-04LX 2D laser range scanner. ICRA09
- W. Fischer, G. Caprari, R. Siegwart, R. Moser (2009) Compact Magnetic Wheeled Robot for Inspecting Complex Shaped Structures in Generator Housings and Similar Environments. IROS 2009
- W. Fischer, F. Tache, G. Caprari, R. Siegwart (2008) Magnetic Wheeled Robot with High Mobility but only 2 DOF to Control. CLAWAR 2008
- S. Bouabdallah, R. Siegwart, G. Caprari. (2006) Design and Control of an Indoor Coaxial Helicopter. In Proc. of IEEE/RSJ Int. Conf. on Intelligent Robots and Systems, China. [IROS'2006]
- M. Asadpour, F. Tache, G. Caprari, W. Karlen, R. Siegwart (2005) Robot-Animal Interaction: Perception and Behavior of InsBot, Proc. of The Conceptual Modeling and Simulation Conference (CMS), October 2005
- F. Tache, M. Asadpour, G. Caprari, W. Karlen, R. Siegwart (2005) Perception and Behavior of InsBot : Robot-Animal Interaction Issues. IEEE Int. Conf. on Robotics and Biomimetics, ROBOT'2005.
- M. Greuter, G. Shah, G. Caprari, F. Tache, R. Siegwart, M. Sitti (2005) Toward Micro Wall-Climbing Robots Using Biomimetic Fibrillar Adhesives. Proc. of the 3rd Int. Symp. on Autonomous Minirobots for Research and Edutainment, Fukui, Japan. [AMIRE'2005]

- S. Garnier, C. Jost, R. Jeanson, J. Gautrais, Asadpour, M., Caprari, G. and G. Theraulaz (2005) Collective Decision-Making by a Group of Cockroach-like Robots. IEEE Swarm Intelligence Symp., p. 233-240.
- G. Caprari and R. Siegwart (2005) Mobile Micro-Robots Ready to Use: Alice. In Proc. of IEEE/RSJ Int. Conf. on Intelligent Robots and Systems, Canada, p. 3295-3300. [IROS'2005]
- A. Colot, G. Caprari, R. Siegwart (2004) InsBot: Design of an Autonomous Mini Mobile Robot Able to Interact with Cockroaches. ICRA'04, New Orleans, p. 2418-2423.
- G. Caprari and R. Siegwart (2003) Design and Control of the Mobile Micro Robot Alice. Proceedings of the 2nd International Symposium on Autonomous Minirobots for Research and Edutainment, AMiRE'03, Brisbane, Australia, p. 23-32.
- M. Lauria, M. Freese, T. Estier, P. Lamon, G. Caprari, R. Siegwart (2003) LameAlice, a Nanorover for Planetary Exploration. In Video Proceedings of the IEEE International Conference on Robotics and Automation, Taipei, Taiwan.
- D. Floreano, N. Schoeni, G. Caprari and J. Blynell (2002) Evolutionary Bits'n'Spikes. In R. K. Standish, M. A. Beadon and H. A. Abbass, editors. Artificial Life VIII: Proceedings of the Eight International Conference on Artificial Life, MIT Press.
- G. Caprari, K.O. Arras and R. Siegwart (2001) Robot Navigation in Centimeter Range Labyrinths. In Proceedings of the First International Conference on Autonomous Minirobots for Research and Edutainment, Heinz Nixdorf Institute, Paderborn, Germany, October 22-25. [AMiRE'2001]
- G. Caprari, T. Estier and R. Siegwart (2000) Fascination of Down Scaling - Alice the Sugar Cube Robot. In Workshop Proceedings on Mobile Micro-Robots, IEEE International Conference on Robotics and Automation, San Francisco, USA, April 24-28.
- G. Caprari, K.O. Arras and R. Siegwart (2000) The Autonomous Miniature Robot Alice: From Prototypes to Applications. In Proceedings of IEEE/RSJ International Conference on Intelligent Robots and Systems, Takamatsu, Japan, October/November, 793-798.
- M. Freese, M. Kaelin, J. Lehky, G. Caprari, T. Estier, R. Siegwart (1999) LAMALice : A Mini Mobile Robot for Planetary Exploration. In Proceedings of the International Symposium on Micromechatronics and Human Science, Nagoya, Japan, p. 129-133.
- G. Caprari, P. Balmer, R. Piguet and R. Siegwart (1998) The Autonomous Micro Robot ALICE: A platform for Scientific and Commercial Applications. In Proc. of the Int. Symp. on Micromechatronics and Human Science, Nagoya, Japan, p. 231-235.
- J.D. Nicoud, O. Matthley, G. Caprari (1998) Control and analysis of low inertia miniature synchronous motors. In Proc. of the Int. Symp. on Micromechatronics and Human Science, p 97-103.
- R. Büchi, G. Caprari, V. Vuscovic and R. Siegwart (1996) A Remote Controlled Mobile Mini Robot. In Proc. of the Seventh International Symposium on Micro Machine and Human Science - Toward Micro-Mechatronics, Nagoya, Japan, October 2-4. p. 203-206.

PhD Thesis

- G. Caprari (2003) Autonomous Micro-Robots: Applications and Limitations. Thèse n° 2753, Faculté Sciences et Techniques de l'Ingénieur, École Polytechnique Fédérale de Lausanne, 2003. Acceptée sur proposition du jury: Prof. R. Siegwart (directeur de thèse), Prof. D. Floreano (rapporteur), Dr. F. Mondada (rapporteur), Prof. J-D. Nicoud (rapporteur), Prof. S. Shooter (rapporteur).