

# Dr. Achim J. Lilienthal

Since July 2005 I am a post-doc/associate professor at Örebro University.

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## Background

- 1991 - 1997: Student of Physics at the University of Konstanz
- Juli 1998: Diploma (M.Sc.) in Physics
- since March 1999: Research Assistant at the Dept. of Computer Architecture at the University of Tübingen



## Research interests

- Gas sensing, mobile robots, ethological models, machine learning, biologically inspired control strategies, and human-robot communication

## [Journal Articles, Conference Papers, Theses, Awards, Press](#)

### Journal Articles

*Building Gas Concentration Gridmaps with a Mobile Robot*

Achim Lilienthal and Tom Duckett

Robotics and Autonomous Systems, Volume 48, Issue 1, 31 August 2004, pp. 3-16

*Experimental Analysis of Gas-Sensitive Braitenberg Vehicles*

Achim Lilienthal and Tom Duckett

Advanced Robotics, Volume 18, Number 8, 1 December 2004, pp. 817-834

### Conference Papers

*Model-based Shape Analysis of Gas Concentration Gridmaps for Improved Gas Source Localisation*

Achim Lilienthal, Felix Streichert, and Andreas Zell

Proceedings of the IEEE International Conference on Robotics and Automation (ICRA 2005), Barcelona, April 18 - 22, 2005, pp. 3575-3580

*Learning to Detect Proximity to a Gas Source with a Mobile Robot*

Achim Lilienthal, Holger Ulmer, Holger Fröhlich, Felix Werner, and Andreas Zell

IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS 2004), Sendai, Japan, September 28 - October 2, 2004, pp. 1444-1449

*Gas Source Declaration with a Mobile Robot*

Achim Lilienthal, Holger Ulmer, Holger Fröhlich, Andreas Stützle, Felix Werner, and Andreas Zell

Proceedings of the IEEE International Conference on Robotics and Automation (ICRA 2004), New Orleans, USA, April 26 - May 1, 2004, pp. 1430-1435

*Gas Source Tracing With a Mobile Robot Using an Adapted Moth Strategy*

Achim Lilienthal, Denis Reimann, Andreas Zell

Proceedings of AMS 2003, 18. Fachgespräch, Karlsruhe, 4./5. Dezember 2003, pp. 150-160

*Approaches to Gas Source Tracing and Declaration by Pure Chemo-Tropotaxis*

Achim Lilienthal, Tom Duckett

Proceedings of AMS 2003, 18. Fachgespräch, Karlsruhe, 4./5. Dezember 2003, pp. 161-171

*Creating Gas Concentration Gridmaps with a Mobile Robot*

- Achim Lilienthal, Tom Duckett  
Proceedings of the 2003 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS 2003), Las Vegas, USA, October 27 - 31, pp. 118-123
- Gas Source Localisation by Constructing Concentration Gridmaps with a Mobile Robot*  
Achim Lilienthal, Tom Duckett  
Proceedings of the European Conference on Mobile Robots (ECMR 2003), Warsawa, Poland, September 4-6, pp. 159-164
- Experimental Analysis of Smelling Braitenberg Vehicles* [Best Paper Award on ICAR 2003]  
[\[press\]](#)  
Achim Lilienthal, Tom Duckett  
Proceedings of the IEEE International Conference on Advanced Robotics (ICAR 2003), Coimbra, Portugal, June 30 - July 3, pp. 375-380
- Gas Distribution in Unventilated Indoor Environments Inspected by a Mobile Robot*  
Michael Wandel, Achim Lilienthal, Tom Duckett, Udo Weimar, Andreas Zell  
Proceedings of the IEEE International Conference on Advanced Robotics (ICAR 2003), Coimbra, Portugal, June 30 - July 3, pp. 507-512
- A Stereo Electronic Nose for a Mobile Inspection Robot*  
Achim Lilienthal, Tom Duckett  
Proceedings of the IEEE International Workshop on Robotic Sensing (ROSE 2003), Örebro, Sweden, June 5-6
- An Absolute Positioning System for 100 Euros*  
Achim Lilienthal, Tom Duckett  
Proceedings of the IEEE International Workshop on Robotic Sensing (ROSE 2003), Örebro, Sweden, June 5-6
- Appearance-based Tracking of Persons with an Omnidirectional Vision Sensor*  
Grzegorz Cielniak, Mihajlo Miladinovic, Daniel Hammarin, Linus Göransson, Achim Lilienthal, Tom Duckett  
Proceedings of the IEEE Workshop on Omnidirectional Vision (OMNIVIS 2003)
- Detektion und Lokalisierung einer Geruchsquelle mit einem autonomen mobilen Roboter*  
Achim Lilienthal, Andreas Zell, Michael Wandel, Udo Weimar  
Robotik 2002, 19./20. Juni 2002, VDI-Bericht Nr. 1679, pp. 689 - 694
- Mobile Robot Using Different Senses*  
Michael Wandel, Achim Lilienthal, Andreas Zell, Udo Weimar  
ISOEN 2002, 29.9. - 2.10., pp. 128 - 129
- Experiences Using Gas Sensors on an Autonomous Mobile Robot*  
Achim Lilienthal, Andreas Zell, Michael Wandel, Udo Weimar  
Proceedings of EUROBOT 2001, Lund, Schweden, 19.-21. September 2001, pp. 1-8
- Leakage Localisation with a Mobile Robot Carrying Chemical Sensors*  
Michael Wandel, Udo Weimar, Achim Lilienthal, Andreas Zell  
Proceedings of ICECS 2001, "International IEEE Conference on Electronics, Circuits, and Systems", Malta, 2. - 5. September 2001, pp. 1247-1250
- Sensing Odour Sources in Indoor Environments Without a Constant Airflow by a Mobile Robot*  
Achim Lilienthal, Andreas Zell, Michael Wandel, Udo Weimar  
Proceedings of ICRA 2001, "Frontiers of Robotics & Automation in the new Millennium", Seoul, Südkorea, 21.-26. Mai 2001, pp. 4005-4010
- Ein autonomer mobiler Roboter mit elektronischer Nase*  
Achim Lilienthal, Andreas Zell, Michael Wandel, Udo Weimar  
Proceedings of AMS 2000, 16. Fachgespräch, Karlsruhe, 20./21. November 2000, pp. 201-210

## **Theses**

*Gas Distribution Mapping and Gas Source Localisation with a Mobile Robot*  
Achim Lilienthal  
Ph.D. Thesis, University of Tübingen, 2004

*Strukturuntersuchungen an  $(C_{60})_n^+$ -Clustern mit der Methode der Gasphasen-Ionenchromatographie*  
Achim Lilienthal  
Diplomarbeit (german only), Universität Konstanz, 1998  
[\[Abstract, KOPS\]](#), [\[pdf\]](#)

## Awards

Förderpreis der TL Stiftung (15.3.2004)

Best Paper Award, ICAR 2003 (30.6.2003)

## Press

["Die Dressur des Riech-Roboters"](#), 17.9.2003 (german only), [Schwäbisches Tagblatt](#)  
[\[html\]](#)

["Abstinenter Roboter erschnüffelt Alkohol"](#), 17.9.2003 (german only), [g-o.de \(geoscience online\)](#)  
[\[html\]](#)

[Interview](#) mit dem [SWR](#), 16.9.2003 (german only)

["Abstinenter Roboter findet die Alkoholquelle"](#), 15.9.2003 (german only), [Informationsdienst Wissenschaft](#)  
[\[html\]](#)>

["Abstinenter Roboter findet die Alkoholquelle"](#), 15.9.2003 (german only), [Pressedienst Forschung Aktuell, Uni Tübingen](#)  
[\[html\]](#)

["Technische Möglichkeiten: 'Zuckungen einer neuen Lebensform'"](#), Juni 2002 (german only), [TV Spielfilm Spezial](#)  
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## Address, phone and fax number, email

Eberhard-Karls-Universität Tübingen  
Wilhelm-Schickard-Institut für Informatik  
Lehrstuhl Rechnerarchitektur  
Sand 1  
D - 72076 Tübingen

Germany

Phone: (+49/0) 7071 / 29 78988

Fax: (+49/0) 7071 / 29 5091

Email (masked to avoid spamming): lilien {at} informatik {dot} uni-tuebingen {dot} de