

# Martin Saska

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## EDUCATION

### March 2006 – April 2009

**Dr.rer.nat. (=Ph.D.) - Julius Maximilians Universität Würzburg, Germany.** International Doctorate Program „Identification, Optimization and Control with Applications in Modern Technologies“ within the **Elite Network of Bavaria**. *Topic of thesis:* „Trajectory planning and optimal control for formations of autonomous robots“, thesis defended in October 2010.

### September 1999 – February 2005

**Ing. (=M.Sc.) - Czech Technical University in Prague**, Faculty of electrical engineering. Master program: Electrical Engineering and Information Technology, Branch of study: Technical Cybernetics (thesis defended with honours).

## WORK EXPERIENCE

### June 2009 - now

#### **Research fellow at Czech Technical University in Prague**

*Main activities:* Management and participation in research projects (Stabilization of micro-UAV swarms under decentralized relative localization, Planning for formation of mobile robots), teaching (robotic courses, support of theses, individual and team student projects), writing proposals of projects supported by European Union and Czech project foundations, writing project reports.

### March 2006 – April 2009

#### **Research fellow at Julius Maximilians Universität Würzburg**

*Main activities:* Research projects (Airport snow shoveling, Formation stabilization and control), teaching (Team design project, Robotics, support of M.Sc. theses), organization of international conferences (IASTED International Conference on Robotics and Applications, IASTED conference on telematics), writing proposals of projects supported by European Union.

### March 2005 – February 2006

#### **Teaching assistant at Czech Technical University**

*Main activities:* Teaching in seminars and laboratory practicum

## **RESEARCH STAY ABROAD AND SEMINARS**

### **September 2011 – October 2011 & June 2013      University of Pennsylvania, USA**

Short research stay at GRASP laboratory (cooperation with group of Prof. Vijay Kumar). Scientific work within a joint CZ-US project COLOS (Control and Localization for Swarms of low-cost helicopters). Scientific results obtained in USA published with US colleagues at conferences and submitted in imp. journals.

### **March 2008 – May 2008      University of Illinois at Urbana-Champaign, USA**

Short research stay at Control and Decision Group of the Coordinated Science Laboratory. Scientific results obtained in USA published with US colleagues at conferences and imp. journal.

### **September 2007 – February 2008      Julius Maximilians Universität Würzburg, Germany**

German courses: Grundstufe I, Grundstufe II, Mittelstufe I

### **September 2006 – June 2009      Elite Network of Bavaria**

IDP Summer-School I, IDP Summer-School II, IDP Winter-School: presentations of top scientists with topic: Identification, Optimization and Control with Applications in Modern Technologies.

## **EDITORIAL ACTIVITIES**

Program committee member: International Conference on Robotics and Applications 2007, FLAIRS-27, IDC 2013, FLAIRS-28, ICUAS 2015

Reviews in imp. journals: IEEE trans. on automatic control, IEEE trans. on automation science and engineering, Journal of intell. & robotic syst., Autonomous robots, Swarm intelligence, European journal of control, Journal of the franklin institute, Engineering and applied mathematics.

Project evaluations: TAČR (>10 proposals of application oriented projects)

## **PROJECTS AND PROPOSALS**

Team member: EU FP7 project Symbrion, MŠMT project SyRoTek

Research coordinator: MŠMT project COLOS (principal investigator L. Přebil)

Principal investigator: Czech Grant Agency project "Stabilization of micro-UAV swarms under decentralized relative localization"

Experience with writing proposals: EU FP7 (>6 proposals), Czech Grant Agency (4 proposals), Ministry of education (2 proposals)

## **AWARDS**

ICUAS 2013 - Best Paper Award; ICRA 2008 - Best Paper Award honored finalist; MSc. thesis awarded the Dean's prize

## **INVITED TALKS**

Lakeside Research Days 2013, IDP Summer-School III 2009, Grasp laboratory – University of Pennsylvania 2011, Bournemouth University 2008, University of Illinois 2008

**SELECTED PUBLICATIONS** (>25 publications in WoS, >35 publications in Scopus, >35 citations according to WoS, >60 citations according to Scopus, >240 citations according to Google Scholar)

- Saska, M. - Vonásek, V. - Krajník, T. - Přeučil, L. Coordination and navigation of heterogeneous MAV–UGV formations localized by a ‘hawk-eye’-like approach under a model predictive control scheme. **International Journal of Robotics Research (IJRR - Ranking:1/21 in Robotics in WoS JCR Science Edition 2012)**, Volume 33, Issue 10, pp 1393-1412, July 2014.
- Saska, M. - Krajník, T. - Vonásek, V. - Kasl, Z. - Spurný, V. - Přeučil, L.: Fault-tolerant formation driving mechanism designed for heterogeneous MAVs-UGVs groups, **Journal of Intelligent & Robotic Systems**, Volume 73, Issue 1-4, pp 603-622, January 2014
- Saska, M. - Vonásek, V. - Přeučil, L.: Trajectory Planning and Control for Airport Snow Sweeping by Autonomous Formations of Ploughs, **Journal of Intelligent & Robotic Systems**, 72(2): 239-261, November 2013.
- Saska, M. - Mejía, J. S. - Stipanović, D. M. - Vonásek, V. - Schilling, K. - Přeučil, L.: Control and navigation in manoeuvres of formations of unmanned mobile vehicles, **European Journal of Control**, Volume 19, Issue 2, March 2013, Pages 157-171, ISSN 0947-3580.
- Krajník, T - Nitsche, M - Faigl, J. - Vaněk, P. - Saska, M. - Duckett, T. - Přeučil, L. - Mejail, M.: A practical multirobot localization system. **Journal of Intelligent & Robotic Systems**, OnlineFirst, 2014.
- Hess, M. - Saska, M. - Schilling, K.: Application of Coordinated Multi Vehicle Formations for Snow Shoveling on Airports. **Intelligent Service Robotics**, Volume 2, Number 4, Pages 205-217, October, 2009
- Saska, M. - Vakula, J. - Přeučil, L.: Swarms of micro aerial vehicles stabilized under a visual relative localization, Proc. of IEEE International Conference on Robotics and Automation (ICRA), 2014.
- Saska, M. - Kasl, Z. - Přeučil, L.: Motion planning and control of formations of micro aerial vehicles, Proc. of the 19th IFAC world congress, 2014.
- Saska, M. - Krajník, T. - Vonásek, V. - Přeučil, L.: Navigation, localization and stabilization of formations of unmanned aerial and ground vehicles. In Proceedings of the International Conference on Unmanned Aircraft Systems (ICUAS'13), 2013. **(Best Paper Award)**
- Saska, M. - Vonásek, V. - Krajník, T. - Přeučil, L.: Coordination and Navigation of Heterogeneous UAVs-UGVs Teams Localized by a Hawk-Eye Approach. In Proceedings of 2012 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS 2012), 2012.
- Saska, M. - Vonásek, V. - Přeučil, L.: Roads Sweeping by Unmanned Multi-vehicle Formations. In IEEE International Conference on Robotics and Automation (ICRA 2011), 2011.
- M. Saska, M. Hess and K. Schilling. Efficient Airport Snow Shoveling by Applying Autonomous Multi-Vehicle Formations. IEEE International Conference on Robotics and Automation, 2008. **(ICRA 2008 Best Paper Award honored finalist)**
- M. Saska, J. S. Mejia, D. M. Stipanovic, and K. Schilling. Control and navigation of formations of car-like robots on a receding horizon, in IEEE Control Applications, (CCA) & Intelligent Control, (ISIC), part of the IEEE Multi-Conference on Systems & Control (IEEE MSC), 2009.
- M. Saska, M. Macas, L. Preucil, L. Lhotska, Robot Path Planning using Particle Swarm Optimization of Ferguson Splines. In IEEE ETFA 2006 Proceedings, 2006.