CURRICULUM VITAE

Name Jan Faigl
Born May 5, 1979, Chomutov, Czech Republic
Education

2010 **Ph.D. in Electrical Engineering and Information Technology**, study branch **Artificial Intelligence and Biocybernetics**, dept. of Cybernetics, Faculty of Electrical Engineering (FEE), Czech Technical University in Prague (CTU)
Thesis: "*Multi-Goal Path Planning for Cooperative Sensing*", (the best phd thesis in the fields of cybernetics and computer science - awarded by the Czech Society for Cybernetics and Informatics). `http://imr.felk.cvut.cz/faiglj/thesis`
`http://www.cski.cz/main.php?id=01.05.04.02`

2003 **Ing.** (∼MSc.) in **Electrical Engineering** at FEE, CTU in Prague
study branch *Technical Cybernetics* (5.5 years program), graduated with distinction

Appointments

2013 *Assistant Professor* at dept. of Computer Science and Engineering, FEE, CTU in Prague
Research Fellow at Agent Technology Center (ATG), `http://agents.fel.cvut.cz`

2010–2012 *Assistant Professor* at dept. of Cybernetics, FEE, CTU in Prague

2003–2012 *Research fellow* at Gerstner Laboratory, dept. of Cybernetics, FEE, CTU in Prague (`http://cyber.felk.cvut.cz`), member of Intelligent and Mobile Robotics group (`http://imr.felk.cvut.cz`, `http://www.youtube.com/imrfel`)

2011 *Research fellow* at the Center for Applied Cybernetics, FEE, CTU, (`http://c-a-k.cz`)

2003–2006 *System Analyst and Programmer* at ProTyS, Inc. - design and development of systems for railway safety and diagnostics (`http://www.protys.cz`)

Professional Services and Skills

- reviewer for journals: Journal of Intelligent and Robotic System, and IEEE Transactions on Systems, Man, and Cybernetics - Part C: Applications & Reviews (since 2006); Autonomous Robots (since 2011); Applied Mathematics and Computation (since 2012); Journal of The Franklin Institute-Engineering and Applied Mathematics (since 2012)
- reviewer for IEEE RSJ/International Conference on Intelligent RObots and Systems (IROS), IEEE International Conference on Robotics and Autonomous (ICRA)
- organizing committee of European Robotics Symposium - EUROS 2008 (`http://www.action-m.com/euros2008`)
- experienced in preparing and submitting EU FP7 project proposals as well as projects for national agencies (GA ČR, MŠMT, MVČR, FRVŠ)
- experienced in field testing and experimenting with mobile robots

Research Interest

mobile robotics, multi-goal planning, path and motion planning, computational geometry, optimal sampling design, multi-robot systems, autonomous field navigation; in general, topics related to a **robotic system for autonomous long-term environment monitoring**

Research Stays

2011 (oct) A short research stay at the University of Pennsylvania, in the GRASP laboratory (prof. Vijay Kumar) - computer vision techniques for relative localization of small unmanned aerial vehicle (UAV) - quadrotor helicopter.

Invited Talks

2011 Towards Control and Localization for Swarms of Low-Cost Autonomous Robots: CoLoS Project Motivations, Research Plan and Expectations, GRASP Laboratory.

2005 Fira MiroSot - G-Bots Team Description. Department of Computer Science, University of Twente, Enschede.

Awards

Antonin Svoboda prize for the best PhD dissertation in the Czech Republic - Czech Society for Cybernetics and Informatics (2011).
Best Paper Award for the Symposium Theory and Applications of Artificial Intelligence (*20th European Meetings on Cybernetics and Systems Research*) - 2010.
RoboTour outdoor delivery challenge - 1^{st} place in 2008 and 2009.
RoboTour outdoor delivery challenge - 3^{rd} place in 2006 and 2007.

Computer Skills

Unix and Linux based operating systems; procedural, object oriented, functional and script programming languages: C, C++, Java, Lisp, Prolog, Ruby, PHP, Lua, Python; shell scripting; Matlab; administration of unix servers;
low-level programming for MCUs (e.g., ATmega, Gumstix Overo boards, etc) including communication protocols

Grants (Principal Investigator)

2012 - Development of Robotic Laboratory for Outdoor Environments - Ministry of Education of the Czech Republic, FRVŠ, Grant No. 2430/Aa (*co-investigator together with Dr. Libor Přeučil*)
2010/2011 - Uncertainty of Mobile Robot Localization in Cooperative Inspection Tasks, Grant Agency of the Czech Technical University, Grant No. SGS10/185/OHK3/2T/13
2005 - Cooperative Planning in Multiple Robotic Systems, Grant Agency of the Czech Technical University, Grant No. 0505413
2005 - Formalization of an autonomous decision system for cooperative robots, Ministry of Education of the Czech Republic, FRVŠ Grant No. 1606/G1
2004 - Design of decision-making system of collaborating robots, Ministry of Education of the Czech Republic, FRVŠ, Grant No. 2042/G1

Teaching

Programming Methodologies - teaching fellow (2003-2006), lecturer (2006)
Programming Techniques - teaching fellow (2005-2010), lecturer (2008, 2010)
System Reliability and Total Quality Management - teaching fellow (2003-2010)
Robots - teaching fellow (2009-2010)
Team work and its organization - teaching fellow (2010-2012)

Diploma Theses Supervised

- Tomáš Pytlíček, *Multi-Robot Exploration Strategies*, 2012.
- Ondřej Fišer, *Optical Mouse Sensor for Indoor Mobile Robot Odometry*, 2010.
- Jan Mačák, *Multi-Robot Cooperative Inspection Task*, 2009, dean award
- Vojtěch Vonásek, *Trajectory Generation for Cooperative Inspection Task*, 2008, dean award

Bachelor Theses Supervised

- Vladislav Vávra, *Multi-Robot Exploration Strategies*, 2011.
- Přemysl Kafka, *Self-organizing maps in multi-goal path planning problems*, 2011.
- Petr Vaněk, *RRT Techniques in Motion Planning Problem*, 2010.
- Lenka Mudrová, *Localization Systems for a Mobile Robot*, 2010.
- Josef Štrunc, *Multi-Robot Exploration*, 2009.
- Tomáš Pytlíček, *Covert Robotic Navigation*, 2009.
- Šimon Fojů, *Mobile Robot Homing Navigation Based on Principles of Evolution*, 2009.
- Hana Szüsová, *Software for Mobile Robotics Education*, 2008.
- Vojtěch Vonásek, *Trajectory Generation for Cooperative Inspection Task*, 2006.

Professional Experience

2011-2012, dept. of Cybernetics, FEE, CTU

- *Control and Localization for Swarms of Low-cost Autonomous Robots* a joint project of the CTU (Dr. Libor Přeučil) and the GRASP laboratory (UPENN, prof. Vijay Kumar).
  - Development a stand-alone sensor module based on Gumstix Overo and Gumstix Caspa camera for a relative localization in robotic SWARM of UAVs
  - Designing hardware concepts
  - Implementation of the tracking software providing relative localization based on image processing techniques
  - Investigation of novel principles of multi-robot coordination rules for applying SWARM of (UAVs - quadrotor helicopters) in autonomous inspection missions

2011, Center for Applied Cybernetics, FEE, CTU

- *R&D in transportation and distribution planning*
  - Development of fast approximate algorithm for a generalized variant of the multiple traveling salesmen problem with min-max criterion, multiple starting cities, initial penalization, non zero costs of cities, and open or closed paths for a particular salesman.
  - Application of the algorithm for vehicle transportation planning in Czech Republic (related to national integrated rescue system).

2006-2011, dept. of Cybernetics, FEE, CTU

- *Autonomous navigation in outdoor environment* - supported by the university development funds.
  The developed system has been experimentally verified in the RoboTour challenge in which mobile robots have to autonomously navigate through a park like environment.
  `http://robotika.cz/competitions/robotour/en`,
  `http://imr.felk.cvut.cz/robotour` (in Czech)
  - Concepts and ideas of mobile robot navigational system
  - Field testing and experimenting
  - Software and hardware project manager
- *SyRoTek - System for robotic e-learning* - supported `http://syrotek.felk.cvut.cz`
  A system consisting of several mobile robots operating in an arena where fix and remotely controlled obstacles are presented. The system is accessible 24/7 and allows to perform real experiments with robots remotely using Player and ROS frameworks.
  - Design of the whole system architecture
  - Implementation of the core system functions (a kind of middleware including communication with MCUs - micro controller units, on-board computers, etc.)
  - Software project manager
  - Organizing an exhibition of the project and IMR group results at the national fair trade (AMPER 2010)

2003-2006, ProTyS, Inc.

- *R&D in safety systems for railways*
  - Testing for safety units of the interlocking plants developed (and used) for the national railways system
  - Testing and verification for railway signaling
  - R&D related to the European Rail Traffic Management System (ERTMS EuroRadio)
  - Design and implementation of *Semi-Autonomous Verification System* (SAVS) a generic system for communication testing in railway safety systems

2003-2005, dept. of Cybernetics, FEE, CTU

- *FP5 IST - PeLoTe project - Building Presence through Localization for Hybrid Telematic Systems* - supported by the European Union. A pioneering project aimed to develop a hybrid human-machine system for search and rescue missions. `http://labe.felk.cvut.cz/~pelote`
  - R&D in cooperation of humans and robots in search and rescue missions.
  - Development of multi-entity mission planning system for inspection (aka multi-robot multi-goal path planning).
- *Multi-Robot system for robotic soccer - FIRA MiroSot league* `http://www.fira.net/?mid=mirosot` - supported by CTU and national grant agencies
  - R&D in cooperative robotics in the field of robotic soccer (FIRA MiroSot league)
  - Design of the system architecture and decision support system
  - Controlling strategies for multi-robot collaboration without explicit communication
  - Software project manager
  - Team leader