Curriculum vitae – Mgr. Martin Pecka, Ph.D.

Education

2013 – 2021: Faculty of Electrical Engineering, Czech Technical University

Course: Electrical Engineering and Information Technology (doctoral program, finished 2021)

Supervisor: prof. Tomáš Svoboda

Thesis: Safe Autonomous Reinforcement Learning

2011 – 2013: Faculty of Mathematics and Physics, Charles University in Prague

Course: Theoretical Computer Science (post-bachelor study program, passed with honors)

Diploma thesis: Detection of 2D features in MARSIS ionogram pictures

2008 – 2011: Faculty of Mathematics and Physics, Charles University in Prague

Course: General information technology (bachelor study program, passed with honors)

Bachelor thesis: Origami diagram creator

Work Experience

2021-now: researcher and robotics software developer for VRAS group, FEE, CTU

2018-2021: research assistant and robotics software development for VRAS group, FEE, CTU

2015-2018: research assistant and robotics software development for CIIRC, CTU

2013-2015: robotics software development for Center for Machine Perception, FEE, CTU

2011-2013: ground truth creation for full-text search classifier, Seznam.cz, a. s. (part-time)

2011: European Space Agency – finalist of the ESA Summer of Code in Space (http://sophia.estec.esa.int/socis2011/), 2 months of development of Earth-observation software in Java

2006-now: occasional work as web developer

Teaching Experience

2023-now: Labs of ARO (Autonomous Robotics) @ FEE CTU

2021: Labs of KUI (Cybernetics and Artificial Intelligence) @ FEE CTU

2020-2021: Labs of ALG (Algorithmization) @ FEE CTU

2013-2016: Labs of IRO (Intelligent Robotics) @ FEE CTU

2013-2018: Labs of RPH (Problem Solving and Games) @ FEE CTU

Other Education

2011: Coaching course; Interquality

2008: Accreditation of the Ministry of education, youth and sports (MŠMT) as:

Main leader of child camps and *Worker with children in freetime*

2007: Medic for recovery events; Junák – svaz skautů a skautek ČR

2006: Johannes Kepler Seminar – an international mathematical seminar in Passau, Germany

Selected Projects

2023: Cooperation with TERMS a.s. - help with converting an existing agricultural robotic platform Roboton to ROS and development of its simulation model in Gazebo.

2022: Cooperation with GasNet, s.r.o. - deploying mobile robots for outdoor inspection of gas pipelines (including navigation in difficult terrain outside pathways)

2018-2021: DARPA Subterranean Challenge – international competition for (mostly-)autonomous exploration of underground spaces with a fleet of mobile robots.

2014-2018: EU FP7 project TRADR targeted at finding ways how mid-sized mobile robots could be integrated in teams of first responders.

Selected Publications

Pecka, M., & Svoboda, T. (2014). Safe Exploration Techniques for Reinforcement Learning - An Overview. In Lecture Notes in Computer Science. Springer. DOI: 10.1007/978-3-319-13823-7

Pecka, M., Zimmermann, K., Reinstein, M., & Svoboda, T. (2017). Controlling robot morphology from incomplete measurements. *IEEE Transactions on Industrial Electronics*, *64*(2), 1773-1782

Pecka, M., Zimmermann, K., Petrlik, M., and Svoboda, T. (2018). Data Driven Policy Transfer with Imprecise Perception Simulation. *IEEE Robotics and Automation Letters*, 3(4):3916–3921

Rouček, T. et al. (2020). DARPA Subterranean Challenge: Multi-robotic Exploration of Underground Environments. In: *Mazal, J., Fagiolini, A., Vasik, P. (eds) Modelling and Simulation for Autonomous Systems.* MESAS 2019. Lecture Notes in Computer Science, vol 11995. Springer, Cham. DOI: 10.1007/978-3-030-43890-6_22

Skills

Languages: Czech (native speaker), English (upper intermediate), German (passive), French (beginner), Russian (beginner), Slovak (passive)

- passed CAE exams in 2012 (English, CEFR level C1)

Driving license: Czech republic, group B (motor car)

General computer skills: MS Windows (experienced user), UNIX systems (experienced user), MS Office suite, LibreOffice suite

IT developer skills:

- project planning, small team leadership, algorithmic thinking
- desktop programming – Python (medium level), C++ (experienced), Cmake; former experience with Java (experienced at the time), Matlab, C#, Prolog, Scheme, Haskell
- system-level development and deployment of SW (focused on robotics use-cases)
- ROS robotics framework guru (karma: 1366 on answers.ros.org, 589 on robotics.stackexchange.com) + Gazebo simulator (classic + new)
- reputation 3053 on stackoverflow.com
- advanced debugging skills (even combining HW and SW issues)

- basic web programming—XHTML, CSS, Javascript + AJAX, PHP, MySQL
- advanced use of Git versioning system
- open source development and maintenance (github.com/peci1 , github.com/ctu-vras)

Other software I'm familiar with: GIMP, Eclipse, LaTeX, Scribus

Soft skills: small team leadership, project planning, couching, empathy, I'm open to receiving and giving constructive feedback, I'm a problem preventer – not a problem generator

Teaching: I can teach IT-related and algorithmization-related subjects. My average score from students' evaluation of teachers is usually between 1.05 and 1.6 .

Other Experience

Scouts group leader 2008-2018 (includes planning, management, team leadership, propagation, project management, responsibility for other people).

My bachelor thesis "Origamist" targeted on 3D software development in Java – Origamist is a CAD system for interactively making paper models. The thesis was defended with the best grade.

Member of top management of the national children contest Expedice Mars 2007 aimed at space exploration and popularization of science. The contest was under patronage of the Czech astronaut Vladimír Remek.

Achievements

Team CTU-CRAS-Norlab I worked for ranked 1st in several rounds of DARPA Subterranean Challenge (2018-2021).

I received the "Most Active SubT Virtual Testbed Contributor" award from DARPA for fixing lots of bugs and improving many aspects of the open-source SubT Challenge simulator.

Rescue-robotics-oriented European research project TRADR I worked on got the best grade in its final review.

McKinsey scholarship 2012 winner.

Scholarship at Charles University for good study results for terms 2008/2009, 2009/2010 and 2011/2012.

Participant of the second level of Mathematical olympiad in years 2005 – 2008 (2006 the 2nd—3rd place, 2008 advance to the national level and there the 26th place).

Interests

Scouting, volunteering, hiking, swimming, frisbee, origami and glued paper models, mathematics, everything about space exploration, mobile and rescue robotics, improving my programming skills by solving non-trivial problems, learning (almost) anything new, playing piano.

September 30, 2024

Martin Pecka