

Georgios Kouros

Robotics Engineer

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Professional Experience

- May 2017 - **Research Assistant**, *EU Horizon 2020 Project BADGER*, Information Technologies
April 2018 Institute (ITI), Centre for Research and Technology Hellas (CERTH)
- Researched localization techniques for subsurface robots
 - Invented a novel method to model Ground Penetrating Radars (GPR) for robot simulation
 - Developed a 3D Subsurface Utility Mapping algorithm for robot-GPR systems
 - Implemented a field coverage path planning algorithm for a constrained mobile robot
 - Implemented an MPC path tracking controller for tractor-trailer robot setups
 - Co-developed a tractor-trailer hitch pose estimator using a camera - apriltag pair
 - Deployed robot software and integrated the various software modules

Voluntary Experience

- Oct 2016 - **Robotics Engineer**, *Pandora Robotics Team*, Aristotle University of Thessaloniki
Nov 2017 (The work listed below was included in my diploma thesis)
- Developed a fully actuated autonomous 4WS4WD car-like robot
 - Developed a 3D model of the robot for simulation and visualization purposes
 - Developed a fuzzy-logic-based path tracking controller for 4WS car-like robots
 - Developed a dynamic local path deformation planner (Reeds-Shepp Band) for 4WS robots
 - Experimented with dynamic global path replanning with feasible motion primitives
 - Performed system integration of the software modules of the robot using ROS
- Nov 2015 - **SW-HW Engineer**, *Pandora Robotics Team*, Aristotle University of Thessaloniki
Sept 2016
- Installed, calibrated and integrated sensors and actuators to the team's USAR robot
 - Developed a teleoperation algorithm for the actuation of the robot and its cameras
 - Optimized robot cable management with custom PCBs for sensors and electronics
 - Performed robot maintenance, hardware modifications and upgrades
 - Participated in the team's mission in Robocup Rescue 2015 in Hefei, China

Education

- 2010-2016 **Diploma (Integrated BSc & MSc) in Electrical and Computer Engineering**,
Faculty of Engineering, Aristotle University of Thessaloniki, Greece
- Grade: 7.84/10, ECTS: 311,
 - Relevant courses: Robotics(10/10), Pattern Recognition(8.5/10), Image Processing(8/10)
 - Thesis (10/10): Development of an Autonomous Robotic Ground Vehicle with a 4WS4WD Kinematic Model and Implementation of a System for Autonomous Exploration in Unknown Environments
 - Thesis Advisor: Assoc. Prof. Loukas Petrou

Publications

- G. Kouros, I. Kostavelis, E. Skartados, D. Giakoumis, A. Simi, M. Guido, D. Tzovaras, "3D Underground Mapping with a Mobile Robot and a GPR Antenna", 2018 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), Madrid, Spain, Accepted
- G. Kouros, C. Psarras, I. Kostavelis, D. Giakoumis and D. Tzovaras, "Surface/subsurface mapping with an integrated rover-GPR system: A simulation approach," 2018 IEEE International Conference on Simulation, Modeling, and Programming for Autonomous Robots (SIMPAN), Brisbane, Australia, 2018, pp. 15-22. doi: 10.1109/SIMPAN.2018.8376265
- G. Kouros and L. Petrou, "PANDORA Monstertruck: A 4WS4WD car-like robot for autonomous exploration in unknown environments", 2017 12th IEEE Conference on Industrial Electronics and Applications (ICIEA), Siem Reap, 2017, pp. 974-979. doi: 10.1109/ICIEA.2017.8282980

Distinctions and Awards

- *2nd Best in Class Autonomy* Distinction bestowed upon Pandora Robotics Team members by the Robocup Federation for Robocup Rescue 2015 competition in Hefei, China
- Excellence Award bestowed upon Pandora Robotics Team members by the Aristotle University of Thessaloniki for our distinction in the Robocup Rescue 2015 competition

Technical Skills

Programming: C, C++, PYTHON, MATLAB/OCTAVE

Parallelization: CUDA, pthreads, MPI, OpenMP

Libraries: OpenCV, PCL, Fuzzylite, ACADO, OMPL, NumPy, SciPy, Matplotlib

Deep Learn.: PyTorch, Tensorflow, Keras

Robotics: ROS, Gazebo, STDR, URDF

Progr. Tools: Git, Vim, CMake, Doxygen

OSs: Linux, Windows

Embedded: Arduino, Raspberry Pi, Odroid, Atmel AVR

Design/Editing: Blender, Camtasia, Inkscape, Paint.net, Eagle CAD

Office Tools: L^AT_EX, Microsoft Office Word/PowerPoint/Visio

Misc.: 3D Modelling, Electronics, PCB Manufacturing, Soldering

Languages

Greek Native Language

English Proficient (C2) *IELTS (8.5) June 2018 | ECPE University of Michigan 2008,*

Professional Development - MOOCs

- Intro to Artificial Intelligence (Udacity)
- Machine Learning (Coursera)
- Introduction to Computer Vision (Udacity)
- CNNs for Visual Recognition (Stanford)

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