Nikos Koukis

Athens, Greece | nickkouk@gmai.com | +30 6985827375

EDUCATION

NAT. TECHNICAL UNIVERSITY OF ATHENS
Diploma in Mech. Engineering
June 2017 | Athens, GR
GPA:8.18 / 10.0

KTH, ROYAL INSTITUTE OF TECHNOLOGY
ERASMUS Exchange program
Jan 2015 - Jun 2015 | Sweeden, SE

LINKS

Github:// **bergercookie**[1]
LinkedIn:// **nikos-koukis**[2]
Stackoverflow:// **bergercookie**[3]

COURSEWORK

University Courses
NTUA

- Introduction to Automatic Control
- Control Systems and Machine Regulations
- Intelligent Control Systems and Robotics
- Numerical Analysis using Fortran
- Operating Systems
- Machine Dynamics I, II
- Machine Elements I, II
- Mechanical Design I, II
- Materials Science
- Advanced Materials
- Manufacturing Processes I, II
- Thermodynamics
- Thermal Turbomachines
- Hydraulic Turbomachines
- Environmental engineering
- Fluid Mechanics
- Electromechanical Power Conversion Systems
- Ergonomics

KTH

- Control Theory and Practice, Advanced Course (EL2520)
- Hybrid and Embedded Systems (EL2450)
- Flight Mechanics (SD2805)
- Computational Fluid Dynamics (SG2212)

References can be provided upon request

PROJECTS EXPERIENCE

MRPT - CORE DEVELOPER[4]
2016 -   C++, Python, Robotics, SLAM
MRPT is a popular open source robotics framework specialized in SLAM and mobile robot applications with over 300+ cites in Google Scholar, 40k+ downloads.

MENTOR AT GOOGLE SUMMER OF CODE (GSOC) - MRPT
May 2017 -
Robust SLAM and localization method using artificial fiducial markers and stereo vision[5]

STUDENT AT GOOGLE SUMMER OF CODE (GSOC)[6] - MRPT
May 2016 - August 2016   C++, CMake, SLAM
See diploma thesis section for details.

DIPLOMA THESIS - INVESTIGATION, DESIGN AND IMPLEMENTATION OF SINGLE AND MULTI-ROBOT SLAM ALGORITHMS[7]
Oct 2015 - July 2017|Control-Systems Lab NTUA[8]   C++, Python, ROS, Gazebo, Ansible

- Study majority of implemented strategies in single-robot and multi-robot Simultaneous Localization and Mapping (SLAM).
- Based on previous analysis, decide on implementing `graphSLAM` over other SLAM alternatives (particle-filtering/FastSLAM, EKF, EIF, etc).
- Design and implement single-robot graphSLAM as part of my Google Summer of Code (GSoC) internship for the Mobile Robot Programming Toolkit (MRPT). Algorithm utilizes laser scans and (optionally) odometry measurements while the design is easily extensible to other types of sensors (3D point clouds, visual etc.). A robust loop-closure scheme based on the work of Olson[9] was also implemented. Code is successfully incorporated in the MRPT codebase. Single-robot simulation demo - GSOC[10]
- Add wrapper code for running graphSLAM in an online (real-time) fashion. ROS[11] was used as the middleware for the inter-process communication and data exchange part. Wrapper classes are publicly available at the ROS wiki[12]
- Extended graphSLAM code to the multi-robot case using a variation of the algorithm presented by Lazaro et al.[13]
- Inter-robot communication was implemented using the multi-master ROS package (multicast protocol) while the algorithm was tested in the Gazebo[14] simulator.
  Multi-robot Simulation demo[15]
- Algorithm has been tested in a real-time environment with Pioneer-2at and Pioneer-2dx models.

PAPER REVIEWING
Dec 2015 - | Control-Systems Lab NTUA
Successfully reviewed a series of papers in the field of single- and multi-robot simultaneous localization and mapping (SLAM) for occasions such as the *Journal of Intelligent and Robotics Systems 2016, MED 2016, IROS 2017*.

Independent Coursework

Various

- Deep Learning with TensorFlow[16] [Ongoing]
- Deep Learning[17] [Ongoing]
- Robot mapping, University of Freiburg[18]
- Artificial intelligence in Robotics[19]
- Up and Running with Django and Python[20]
- Code Clinic - Python[21]
- C++: Move Semantics[22]
- Learning Ansible[23]
- Introduction to Linux[24]

Coursera

- Control of Mobile Robots[25]
- Interactive Programming Using Python
- High Efficiency Scientific Programming
- Computer Networks
- Modelling Engineered Systems
- Nanotechnology: The Basics
- The Art of Negotiation
- Work Smarter, Not Harder: Time Management for Personal and Professional Productivity

SKILLS

Programming - Software

Excellent Knowledge:
C++• Python • ROS • Git • Matlab • Latex
Good Knowledge:
Ansible automation tool • CMake • Gazebo • Fortran • C • Shell Scripting • Make
Familiar:
Objective-C • Vim Scripting • C# • Java • Haskell

LANGUAGES

English: C2 Proficiency
Greek: Native Language
German: B1 Proficiency

SUPPLEMENTARY

Public Speaking • Scientific Computing • MS Office • SolidWorks • Vim Editor

PUMP3000

May 2014 – July 2014 | Biolab NTUA   Python, Qt

- As an individual Project, I developed an interactive GUI for controlling Cavro XP 3000 Pump[26] series.
- The software is currently used in medical projects in the bioengineering laboratory of the mech. engineering department of NTUA
- The UI was written in Python using Qt and PySide.
- The software is open-source, licensed under the BSD 2-clause.
- Code and documentation for configuring/using the software can be found here[27]

SPERMPROJECT

Oct 2015 - Jan 2016 | Biolab NTUA   Python, Matlab, Java

- Design the hardware and software for a sperm-test device. The goal of the device is to offer an in-house cost-affordable alternative to the costy, and often uncomfortable for the patient, procedure of laboratory sperm exam
- Design in CAD the device for magnification
- Code an android application, which is to run on the phone of the consumer's phone
- Implement a client-server protocol for sending a video of the sperm sample to an external server for image analysis. Implemented, so that the computational/time requirements are independent of the consumer's android device. The server side module was written in Python while the client was an android application (Java).
- Boilerplate code of the image analysis algorithm for extracting total population and sperm motility statistics from the given video
- Information about the overall project can be found here[28] while the code is can be accessed from Github:
  - Android App[29]
  - SpermProject server application[30]

PATTERN RECOGNITION AND LINE-FOLLOWER ROBOT: DRK8080[31]

Aug 2013 | Universitae Politechnica Din, Timisoara   C#

CONTROL OF MIMO FOUR-TANK PROCESS Jun 2015 | Control Theory

Advanced Course, KTH   Matlab

Experimented with the behavior of advanced control theory strategies on a 4 water-tank process.

- The goal was to drive the level of the 2 lower tanks by controlling the voltage of two corresponding pumps.
- Implemented decoupling decentralized control scheme and Glover-McFarlane robustness method

PID DIGITAL CONTROL OF PIONEER-3DX Spring 2015 | Hybrid and

Embedded Systems, KTH   C

Aerodynamic and Stability Analysis of J35 Draken[32]

Spring 2015 | Flight Mechanics, KTH   Matlab

ELECMICROSCOPE2000

Sep 2015 - Oct 2015 | Biolab NTUA   Matlab, Arduino

- Developed the GUI for interacting with embedded arduino code for the control of the microscope platform and shutter
- Written in MATLAB and GUIDE
- The software is open-source, licensed under the BSD 2-clause
- Code and documentation for configuring/using the software can be found here[33]

AWARDS

2014	European	Represented Greece in EBEC[34] Final, Riga, 4th/13 overall
2014	National	European BEST Engineering Competition (EBEC), National Winner
2011	National	The Big Moment For Education, EUROBANK National Examinations Award

REFERENCES

Master thesis supervisor

Kostas J. Kyriakopoulos
Professor of Robotics - National Technical University Of Athens, Greece
kkyria@mail.ntua.gr
(+30) 2107723595
http://www.controlsystemslab.gr/kkyria/

Project Lead at MRPT

Jose Luis Blanco Claraco
Associate Professor - University of Almería
jlblanco@ual.es
(+34) 950214233
https://w3.ual.es/~jlblanco/

Notes

[1] http://github.com/bergercookie

[2] http://linkedin.com/in/nikos-koukis-a1564885

[3] http://stackoverflow.com/users/2843583/bergerrcookie

[4] http://mrpt.org

[5] https://github.com/MRPT/GSoC2017-discussions/issues/5

[6] https://summerofcode.withgoogle.com/archive/2016/projects/6025600208732160/

[7] http://controlsystemslab.gr/code/bergercookie/mr-slam-thesis-text/src/master/report.pdf

[8] http://controlsystemslab.gr

[9] https://april.eecs.umich.edu/pdfs/olson2009ras.pdf

[10] https://www.youtube.com/watch?v=Pv0yvlzrcXk

[11] http://ros.org

[12] http://wiki.ros.org/mrpt_graphslam_2d

[13] https://webdiis.unizar.es/~mtlazaro/papers/Lazaro-IROS13.pdf

[14] http://gazebosim.org

[15] https://www.youtube.com/watch?v=4RKS2jrvsYE

[16] https://www.udemy.com/deep-learning-with-tensorflow/learn/v4/content

[17] https://classroom.udacity.com/courses/ud730

[18] https://www.youtube.com/watch?v=U6vr3iNrwRA&list=PLgnQpQtFTOGQrZ4O5QzbIHgl3b1JHimN_

[19] https://www.udacity.com/course/artificial-intelligence-for-robotics--cs373

[20] https://www.lynda.com/Django-tutorials/Up-Running-Python-Django/386287-2.html

[21] https://www.lynda.com/Python-tutorials/Code-Clinic-Python/163752-2.html

[22] https://www.linkedin.com/learning/c-move-semantics?trk=publicProfile-public_profile_v3_desktop-learningFeedm011:a001--379654_learning

[23] https://www.linkedin.com/learning/learning-ansible

[24] https://www.edx.org/course/introduction-linux-linuxfoundationx-lfs101x-1

[25] https://www.coursera.org/learn/mobile-robot

[26] http://blog.mbedded.ninja/wp-content/uploads/2013/03/cavro-xp-3000-syringe-pump-operators-manual.pdf

[27] http://bergercookie.github.io/Projects/Pump3000/

[28] http://biotech-ntua.wikispaces.com/Project_20152016_Spermodiagram

[29] https://github.com/bergercookie/SpermProject

[30] https://github.com/bergercookie/SpermProject_server

[31] https://www.best.eu.org/event/details.jsp?activity=afdp71v

[32] https://github.com/bergercookie/flight-mechanics

[33] https://github.com/bergercookie/ElecMicroscope

[34] https://ebec.best.eu.org/index.php/about-ebec/