

Detailed Curriculum Vitae

Name: Aris I. Synodinos
Date of Birth: 26/12/1985
Place of Birth: Athens, Greece
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Education **PhD in Engineering, (On a break)** 02/2009 - Current Date
University Of Patras - School of Engineering
Supervisors: N. Aspragathos, A. Tzes, M. Vrahatis
'Dexterous manipulation in unstructured environments using a robotic mobile manipulator'

Mechanical Engineering and Aeronautics Diploma, 09/2003 - 02/2009
5 Year Studies - MSc Equivalent
University of Patras - School of Engineering
Grade: 7.60
Diploma Thesis: 'Self-Assembly of MEMS using electrostatic forces'

Experience **Systems Engineer - Technical Lead, Unibap AB** 03/2019 - Current Date

- Design and Implementation of a distributed image processing pipeline (python, C++, ROS)
- Robotics Engineer with ROS/MoveIt (ABB, Yaskawa, Universal Robots)
- Design and Implementation of the SpaceCloud Framework - Orchestration software for Small Satellites (Docker, gRPC, python)
- Design and Implementation of the CI/CD (GitLab, Docker, reprepro, nexus)
- Trained junior engineers and lead the presentation of technical training for products

Consultant Robotics Engineer, CBB AB 05/2018 - 02/2019
Assigned at Unibap AB

- Implemented ROS Drivers and communication for products (C++, python, ROS)
- Consultant in mobile robotics projects for R&D (C++, ROS)
- Designed and developed customer specific projects in industrial vision products (python, ROS)

Lead Robotics Engineer, Myrmex-Inc 02/2016 - 04/2018

- Designed the infrastructure for mobile and manipulator robots in structured environment
- Designed and developed robotics software (control, motion planning, scheduling, safety, drivers)
- Developed landmark recognition (OpenCV) algorithm for mobile robot localization (100fps, high accuracy)
- Developed mobile robot motion planning algorithm for smooth trajectory tracking using S-Curve jerk control with Cubic Hermite Splines (1KHz control loop)
- Developed hardware drivers and protocols for ROS (LRF, Camera, CAN, RS232)
- Trained members of the R&D department

- Developed software for maintaining software components (deployment and development utilities)
- Developed frontend (QT and ROS) and backend
- All development in C++/C++11 with extensive use of STL, Boost, Eigen, OpenCV, ROS, Qt, CMake

Robotics Engineer, Freelancer at Escapepolis 09/2017 - 04/2018

- Mechanical design of a 3 degrees of freedom (x - pitch - yaw) ceiling mounted robot
- Software and electrical design (Component selection, Power Electronics, Embedded Computers, Overall architecture)
- Embedded development (CAN communication, RS232 communication, PID controllers, Trajectory Planning) with Teensy 3.2 in C++
- Robotics development for calibration and control of the robot in Python 3 with MQTT
- GUI development in Python3 with PySide

Robotics Engineer, Freelancer at Myrmex-Inc 10/2015 - 2/2016

- Designed the overall architecture of a fully automated click and collect system
- Designed the implementation of software modules in ROS
- Trained members in ROS and CMake (C++/C++11)

Robotics Engineer, Freelancer at BOTA Systems 01/2016 - 9/2016

- Developed ROS interface and C++ library for force/torque sensors
- Performed all testing and integration of force/torque sensors in ROS
- Designed the communication protocol and infrastructure for products
- Lead the application to Kickstart Accelerator 2016 Program

Robotics Researcher, Freelancer at LMS Univ. of Patras 07/2014 - 2/2016

- Lead the participation in the European Robotics Challenges team EUSMART
- Developed software for RGB-D sensors using PCL for Stage I, Part A
- Developed software for Motion Planning using MoveIt for Stage I, Part A,
- Developed software for Computer Vision using OpenCV for Stage II, Round A,
- Developed software for Hybrid Control (Force Feedback, gravity compensation) for UR10
- Lead the experiments of Stage II, Round A at Fraunhofer IPA
- All development in C++/C++11 with extensive use of STL, Boost, ROS, OpenCV, PCL, Qt, CMake

Mechanical Engineer, Freelancer at GRNET SA - GFOSS 08/2015 - 10/2015

- OpenDeskLab - Development of a modular and reconfigurable laboratory desk
- <https://github.com/ellak-monades-aristeias/OpenDeskLab>
- <https://opendesklab.readthedocs.org>
- All mechanical design in SolidWorks
- All documentation in reStructuredText with readthedocs

Software Engineer, Freelancer at GRNET SA - GFOSS 08/2015 - 10/2015

- Docker integration in CMake/CPack
- <https://github.com/ellak-monades-aristeias/CMake-Docker>
- All development in C++ and CMake

Robotics Researcher, FP6 Research Program 'I-Proms' 02/2009 - 2011

- Studied the dexterity optimization of robotic work cells

- Developed a fuzzy system to approximate the calculation of the Jacobian condition number
- All development in Matlab/Octave

Mechanical Engineer, FP6 Research Program ‘4M’ 02/2009 - 2011

- Worked as a research assistant at IMTEK
- Studied the self-assembly of MEMS
- Developed simulation software for the electro-static driven self-assembly
- All development in Matlab and GUIDE

Lab Instructor, Dept. of Mechanical Eng. & Aeronautics 02/2009 - 02/2016

- Class of Mechatronics
- Class of Electrical Design
- Class of Robotics

Project Manager, Robotics Club 02/2009 - 02/2016

- Manager of undergraduate team ‘PolyMECHanon’ to participate in RoboCUP Rescue League
- Lecturer for the training of new members (C++/ROS/CMake)

Tutor - Lecturer,

- GrabCAD Workshop - GFOSS at Innovathens 22/1/2016
- Contributing to Gretl - GFOSS, Theme “Basic Tools - GRETL” 20/5/2015
- 1st Summer School of ‘Units of Excellence in Open Source’
- 2nd L^AT_EX Workshop - Patras IEEE Student Branch 19/2/2015
- 1st L^AT_EX Workshop - Patras IEEE Student Branch 19/4/2013
- L^AT_EX Workshop - P-Space 9/10/2012
- Linux for beginners - P-Space 24/9/2012
- ROS Workshop - Robotics Club 15/10/2011 - 18/10/2011

Training

Seminars,

- Digital Design in VHDL & FPGA 11/2014 - 12/2014
50 hours - Lectures, simulation, laboratory work and exams
- 2nd Seminar of ‘Units of Excellence in Open Source’ 07/2014 - 07/2014
EL/LAK - Theme “Basic Tools - GRETL”
- Geothermal Energy 01/2007 - 01/2007
Aid Engineering

Summer Schools,

- 1st Summer School of EL/LAK ‘Units of Excellence’ 05/2015
Theme “Basic Tools - GRETL” in Patras, Greece
- Safety Security and Rescue Robotics Summer School 2012 09/2012
Sponsored by IEEE-RAS in Alanya, Turkey
- ROS RoboCup Rescue Summer School 2012 08/2012
Graz, Austria, Track 2
- ROS RoboCup Rescue Summer School 2011 09/2011
Koblenz, Track 1
- 2nd Summer School of Artificial Intelligence - HAISS-11 07/2011
University of Patras

Publications & Awards

Journals,

1. J. Dalin, J. Wilde, A. Zulfiqar, P. Lazarou, A. Synodinos, N. Aspragathos, 'Electrostatic attraction and surface-tension-driven forces for accurate self-assembly of microparts', *Microelectronic Engineering*, Volume 87, Issue 2, February 2010, Pages 159-162
2. C. Valsamos, V.C. Moulianitis, A.I. Synodinos, N.A. Aspragathos, 'Introduction of the High Performance Area measure for the evaluation of metamorphic manipulator anatomies', *Mechanism and Machine Theory*, Volume 86, April 2015, Pages 88-107
3. A.I. Synodinos, V.C. Moulianitis, N.A. Aspragathos, 'A fuzzy approximation to dexterity measures of mobile manipulators', *Advanced Robotics*, Volume 29, March 2015, Pages 753-769
4. V.C. Moulianitis, A.I. Synodinos, C.D. Valsamos, N.A. Aspragathos, 'Task-based optimal design of metamorphic service manipulators', *ASME. J. Mechanisms Robotics*, Volume 8, Issue 6, 2016

Conferences,

1. J. Dalin, J. Wilde, A. Synodinos, P. Lazarou and N. Aspragathos, 'Concept for Fluidic Self-Assembly of Micro-Parts Using Electro-Static Forces', 4M Conference 2008, 9-11 September 2008, Cardiff, United Kingdom
2. A. Synodinos, N. Aspragathos 'Path planning of a mobile robot using solid modeling techniques on potential fields', *Proceedings of 2010 IEEE / ASME International Conference on Mechatronic and Embedded Systems and Applications, MESA 2010*, art. no. 5552011, pp. 549-553
3. A. Synodinos, N. Aspragathos 'A fuzzy approximation to the Jacobian condition number', 6th IPROMS Virtual Conference - 15-26 November 2010
4. A. Synodinos, N. Aspragathos 'Υπολογισμός δείκτη επιδεξιότητας ρομποτικού βραχίονα με χρήση ασαφούς λογικής' 2nd Greek Robotics Conference, 9-10 December 2010, University of Patras, Rio Achaia
5. A. Synodinos, N. Aspragathos 'Frame invariance of the dynamic manipulability measure, Multibody Dynamics 2011, An ECCOMAS Thematic Conference, 4th-7th July 2011, Université catholique de Louvain, Brussels, Belgium
6. I. Papanikolaïdi, A. Synodinos, V.C. Moulianitis, N. Aspragathos, E.K. Xidias 'Optimal Base placement of the Da Vinci System based on the Manipulability Index', 22nd International Conference on Robotics in Alpe-Adria-Danube Region, RAAD 2013, pp. 262-268
7. A. Synodinos, N. Aspragathos 'Collision Planner - A probabilistic single stage smooth path planner for mobile robots', 23rd International Conference on Robotics in Alpe-Adria-Danube Region, RAAD 2014, pp. 1-8

Workshops,

1. V.C. Moulianitis, N.A. Aspragathos, A.I. Synodinos, C.D. Valsamos, 'Task-based optimal design of serial metamorphic manipulators', Task Based Optimal Design of Robots Workshop, IEEE International Conference on Robotics and Automation. 2014

Book Chapters,

1. P. Koustoumpardis, K. Chatzilygeroudis, A. Synodinos, N. Aspragathos 'Human robot collaboration for folding fabrics based on force-RGB-D feedback', *Advances in Robot Design and Intelligent Control*, Volume 371, 2015, Pages 235-243

Awards,

1. 'Best contribution on an Open Source Software' by the GFOSS 19/11/2015
For the contribution in <https://github.com/progtologist/gretl>

Personal skills and competences	Programming,	
	Expert:	C++, C++11, Python
	Excellent:	Shell (Bash, Zsh), L ^A T _E X
	Proficient:	C, Arduino, Matlab, OpenMP, html, VHDL
	Familiar:	SQLite, MySQL, PostgreSQL, OpenCL, TikZ, PGF, JavaScript
	Frameworks	ROS, Qt, GTK, Boost, Google Test, Eigen3, PCL OpenCV, XML, YAML, JSON
	Tools:	git, hg, svn, CMake, Make, Gazebo, Doxygen, Docker, LibreOffice, MS Office, Sublime Text, QtCreator, Eclipse, CMS (Wordpress, Drupal, PivotX)
	CAD/EDA:	Catia, Solidworks, UGS NX, AutoCAD, Ansys, KiCAD, Eagle
	Operating Systems:	MS Windows (XP, Vista, 7, 8, 10) Linux (Ubuntu, Debian, Arch, CentOS)
	Languages:	Greek, Mother tongue English, Full professional proficiency
	Interests:	Electronics, Mechatronics, DIY, Cycling, Music, Audio, Radio Broadcasting, Photography, Reading, Programming