

Sanoudos – Dramaliotis Taxiarchis – Fokion



fsanoudos@gmail.com, +1 857 799 0893
85 Auburn Park, Apt. 206, 02139, Cambridge, USA

The way we live is fundamentally, unequivocally, and undeniably shaped by technology and I want to play a major part in shaping people's lives through it. Throughout my studies I was fascinated by both mechanical engineering and software development particularly for use in technical applications. Eager to use my skills, I combine them in robotics, and I pursue relevant solutions to many problems I encounter; one that I am individually involved at the moment, is medical device development for health monitoring and drug delivery.

Education

- ETH Zurich** Zurich, Switzerland
MSc in Robotics, Systems & Control 2020 - 2024
Current G.P.A 5.1/6.0 - 3.5/4.0 | Thesis Grade:
- Coursework in Advance Machine Learning, Probabilistic AI, Computer Vision
 - Coursework in Robot Dynamics, Autonomous Mobile Robots, Soft Robotics, Microrobotics, Nanorobotics
 - Coursework in Model Predictive Control, Dynamic Programming & Optimal Control, System Identification
 - Semester Project: Squashy – Design of a multimodal soft drone for restricted environments
 - Master Thesis: An Ingestible Gastric Resident System for Cardiovascular Monitoring
 - Fully funded scholarship by Hellenic Petroleum Group for studies abroad
- National Technical University of Athens** Athens, Greece
Diploma (Integrated BSc & MSc) in Mechanical Engineering 2013 - 2019
Mechanical Design & Control Systems Specialization
G.P.A 8.73/10.00 - 3.5/4.0 (top 5%) | Thesis Grade: 10.0/10.0
- Coursework in Fluid Mechanics, Thermal Engineering, Thermodynamics
 - Coursework in Mechanical Design, Automatic Control, Manufacturing Technology
 - Coursework in Industrial Management, Operational Research
 - Senior Thesis: "Active Vibration Control of Composite Structures using Piezoelectric Patches"
 - Technical Chamber of Greece Award for top rank acceptance in technical university
- Lyceum M.N Raptou** Larissa, Greece
Technology Direction - Information Science and Service Course 2010 – 2013
Apolytirion 19.7/20.0 (Rank: 2nd)
- Set up Astronomy elective course for STEM integration in school's curriculum. 7/30 students attended
 - Member of Algebra and Geometry honors class preparing for Panhellenic Mathematics Competition
 - Tutored fellow students in Mathematics and Physics weekly

Engineering Research Experience

- GI Lab, BWH – Harvard Medical School – MIT** Cambridge, MA, USA
Exchange Researcher September 2022 – Present
- Developing – as part of a multidisciplinary team – microneedle patches (MAP) for long-term drug delivery
 - Participating in a cross-functional team to develop, and document a MAPs scaled manufacturing process
 - Organising and facilitating ideation tools for MAPs geometry and material selection and, experimental validation methodology
 - Delivering weekly progress reports catering comprehensive updates and discussions on critical points
 - Supervising and mentoring undergraduate student for multiple projects, conducting daily progress discussions and enabling knowledge transfer

GI Lab, BWH – Harvard Medical School – MIT
Exchange Researcher

Cambridge, MA, USA
November 2022 – August 2023

- Played a key role in developing advanced medical devices for drug delivery and health monitoring during master's thesis and projects
- For my master's thesis, designed, prototyped, in vitro/vivo characterised electronic assemblies for health sensing (body temperature, cardiovascular and respiratory vital signs)
 - Utilized signal processing (FFT, Wavelet Decomposition) and machine learning (Autoregressive model, PCA, SVM) for data analysis
 - Achieved accuracy comparable to existing tools with double to quintuple sensing duration
- Co-designed novel pump and valve assembly for implantable robotic device treating opioid overdose
 - Outperformed current solutions in overdose detection and reversal time by several minutes, while maintaining compact size and cost-effective manufacturing
- Performed in-vitro and in-vivo pharmacokinetic studies for device performance evaluation
- Coauthor research papers under publication for both projects

Environmental Robotics Lab, ETH Zurich
Research Assistant

Zurich, Switzerland
February 2022 – May 2022

- As my semester project, researched adaptive terrestrial locomotion for a soft multimodal aerial drone
- Employed evaluation matrices to compare locomotion methods and actuation strategies based on project requirements and key results, validating them computationally (SOFA)
- Developed prototype (3D printing, laser cutting, electronics assembly) and experimentally validated it in varied static and dynamic conditions, documenting qualitative and quantitative results

Control Systems Lab, National Technical University of Athens
Research Assistant

Athens, Greece
October 2018 – February 2020

- As my diploma thesis, developed and validated a model-based control algorithm for active vibration and impact control of composite structures using piezoelectric elements as actuators and sensors
- Employed distributed finite elements to model beam and plate structures (ANSYS), determining their dynamic characteristics (FFT, custom C functions for M, K, C matrix calculation)
- Implemented a LQR control scheme in state space (MATLAB), effectively reducing actuation energy and rapidly damping the system, validated through both computational and experimental work
- In continuation, engineered (SolidWorks, LabView) experimental assembly for impact studies on composite structures
- Co-authored research manuscript for publication

Poseidon ATEVE (electromechanical engineering and industrial projects)
Mechanical Engineering Intern

Farsala, Greece
June – September 2018

- Designed (SolidWorks, ANSYS) and supervised the manufacturing of electromechanical equipment
- Installed automated procedures along the production line and set up 4 CNC machines
- Validated and updated safety protocols within the production unit

Mechanical Design Lab, National Technical University of Athens
Research Assistant

Athens, Greece
March – October 2017

- Researched spur gear lubrication hydrodynamics using computational analysis
- Developed C based functions to implement fluid-solid interaction in steady and transient state

Mechanical Design Lab, National Technical University of Athens
Research Assistant

Athens, Greece
February – August 2016

- Developed proprietary software (MATLAB) to facilitate geometrical design of asymmetric involute gear tooth profile and studied determination of the asymmetric gear mechanical characteristics
- Published research paper and presented it in 7th International Conference "From Scientific Computing to Computational Engineering". Received Thomaeidio award for widely recognized published paper
- Committed 4 hours per week as teaching assistant for Machine Elements II course

Space Lab, Imperial College London
Research Intern

London, UK
June – August 2015

- Conducted experimental research on the deformation and failure features in hot stamping procedures for future use in automotive and aerospace industry

Mechanical Engineering Department, Imperial College London
Research Intern

London, UK
July – August 2014

- Conducted literature review, in collaboration with Ford Motor Company, on application of laser induced incandescence in optical engine for in-cylinder soot diagnostics in diesel engines

Mechanical Design Lab, National Technical University of Athens
Research Intern

Athens, Greece
March – June 2014

- Trained on mechanical measuring techniques and metrology of 3D structures
- Designed (Solidworks) a functioning gear box used for educational purposes

Additional Experience

Student Project House, ETH Zurich
Project Lead – Community Member

Zurich, Switzerland
October 2021 – August 2022

- Developed obstacle avoidance algorithm (Swift) for visually impaired people using smartphones' LIDAR
- Managed team of 3 developers with daily progress discussions and problem-solving sessions
- Communicated with visually impaired people about required features in assistive solutions

Skills

Software: Microsoft Office Suite, LaTeX, Adobe Creative Suite, Visual Studio, XCode

Specialized Software: Wolfram Mathematica, Solidworks, Fusion 360, AutoCAD, SolidCAM, KISSsoft, ANSYS, LS Dyna, ProModel, Neural Designer, Slicer, MeshLab, LabView, MATLAB (& Simulink), Sofa Framework, Altium Designer

Programming languages: Python, FORTRAN 77/95, C, Swift

Research & Prototyping Tools: Soldering, Electronics Assembly, FDM & Resin 3D Printing, CNC Milling & Lathe, Laser cutter, Material Testing Systems, Injection Molding, HPLC, Profilometer

Languages:

English full working proficiency (TOEFL iBT 114/120), German good working proficiency (Goethe-Zertifikat B2), French elementary knowledge, Greek native language

Interests:

- Raspberry Pi Projects, Building radio-controlled models, Restoring vintage electronic devices
- Mentor at SWE
- Skiing, Windsurfing, Tennis (national competitive level), Flag Football (local team)
- Classical piano (8 years formal education), Electric Guitar (2 years formal education)