Konstantinos Chatzilygeroudis

Curriculum Vitae

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At a glance

Current Positions	**Assistant Professor in Robotics** at the E&CE, University of Patras, Greece
	Robotics Engineer at **Ragdoll Dynamics**, London, UK
Previous Position	**Post-Doctoral Fellow** at **LASA** - **EPFL**, Switzerland
	Computer Vision R&D Team Leader at **Metargus** startup
Education	**PhD in Robotics/Machine Learning**
Highlights	Recipient of an H.F.R.I. Grant for Post-doctoral Fellows (2022)
	Best paper award at GECCO 2022
Scientific Activities	**Associate Co-Chair** at **IEEE TC on Model-based Optimization for Robotics**, **Associate Editor** at **IROS**
Research Keywords	Robot Learning, Reinforcement Learning, Evolutionary Robotics, Machine Learning

Education

Oct 2015–Dec 2018 **PhD in Robotics and Machine Learning**, *University of Lorraine - Inria Nancy (LARSEN Team)*, France.

September 2016 **Gaussian Process and Uncertainty Quantification Summer School**, *University of Sheffield*, UK.
Organizers: Javier Gonzalez, Richard Wilkinson, Jeremy Oakley, Neil Lawrence, Sheffield ML Group

2009–2014 **Diploma of Computer Engineering and Informatics**, *CEID, University of Patras*, Greece, *GPA – 8.25/10*.
Specialized in Artificial Intelligence, Robotics, Software Engineering and Computer Graphics - Top 5%

Other

2010–2015 **Online Courses**, *Coursera, edX, Udacity*.
I have attended and completed over 15 online courses covering a very broad range of topics, including Software Engineering, Artificial Intelligence, Robotics, Control Theory, Machine Learning, Game Theory, Digital Signal Processing, e.t.c.

2006–2009 **High School**, *G.E.L. Kato Kastritsiou*, Patras, Greece, *GPA – 19.3/20*.
Specialized in Mathematics/Physics

Academic/R&D Experience

July 28 2023–now **Assistant Professor in Robotics**, *Systems and Control Division*, Department of Electrical and Computer Engineering, University of Patras, Patras, Greece.

July 2023–now **Robotics Engineer**, *Ragdoll Dynamics*, Imbalance Ltd., London, UK.
Integrating state-of-the-art model-based control algorithms in Maya characters for improving the workflow of animators.

July 2023–now **Principal Investigator**, *Computational Intelligence Laboratory (CILab)*, University of Patras, Department of Mathematics, Patras, Greece.
Research Topic: Novel Optimization Methods for Autonomous Skill Learning in Robotics
Scientific Collaborator: Michael N. Vrahatis
Funding: Hellenic Foundation for Research and Innovation (H.F.R.I.) under the "3rd Call for H.F.R.I. Research Projects to support Post-Doctoral Researchers" – project number 7541)
Project Website: https://nosalro.github.io/

Oct 2022–July 2023 **Post-Doctoral Fellow**, *Computational Intelligence Laboratory (CILab)*, University of Patras, Department of Mathematics, Patras, Greece.
Research Topic: Novel Optimization Methods for Autonomous Skill Learning in Robotics
Scientific Collaborator: Michael N. Vrahatis
Funding: Hellenic Foundation for Research and Innovation (H.F.R.I.) under the "3rd Call for H.F.R.I. Research Projects to support Post-Doctoral Researchers" – project number 7541)
Project Website: https://nosalro.github.io/

Aug 2021–Jul 2022 **Robotics Engineer**, *Ragdoll Dynamics*, Imbalance Ltd., London, UK.
Integrating state-of-the-art model-based control algorithms in Maya characters for improving the workflow of animators.

Jan 2021–Jul 2022 **Computer Vision Team Leader**, *Metargus*, Startup, Patras, Greece.
Leading the R&D Computer Vision Team. Metargus creates software for automated basketball game/practice analysis.

Oct 2021–Sept 2022 **Adjunct Lecturer**, *Department of Computer Engineering & Informatics (CEID)*, University of Patras, Patras, Greece.
I am teaching the undergraduate courses: **"Introduction to Artificial Intelligence"**, and **"Intelligent Systems and Robotics"**.

Feb 2022–Jul 2022 **Post-Doctoral Fellow**, *Department of Computer Engineering & Informatics (CEID)*, University of Patras, Patras, Greece.
Project: Manfish **Research Topic:** AI Methods for Autonomous Disease Detection
Project Director: John Theodorou

Oct 2021–Jul 2022 **External Teaching Staff**, *Hellenic Open University (HOP)*, Patras, Greece.
Teaching at the laboratory class **"Introduction to Programming (Python)"**.

Jun 2020–Oct 2022 **Research Affiliate**, *Computational Intelligence Laboratory (CILab)*, University of Patras, Department of Mathematics, Patras, Greece.
Research Topic: Evolutionary Robotics, Evolutionary-Based Reinforcement Learning
Scientific Collaborator: Michael N. Vrahatis

Oct 2020–Jul 2021 **Adjunct Lecturer**, *Department of Computer Engineering & Informatics (CEID)*, University of Patras, Patras, Greece.
Taught the undergraduate courses: **"Introduction to Artificial Intelligence"**, and **"Intelligent Systems and Robotics"**.

Nov 2020–Dec 2020 **Research Fellow**, *Big Data Lab, Hellenic Open University*, Patras, Greece.
Research Topic: Efficient Methods for Entity Resolution
Scientific Supervisor: Vassilios Verykios

Apr 2020–Dec 2020 **Research Fellow**, *Computer Technology Institute and Press "Diophantus" (CTI)*, Patras, Greece.
Research Topic: Robot Learning, Reinforcement Learning and Game Theory
Funding: Project *NETO*
Project Director: Theodoros Komninos
Scientific Collaborator: Paul Spirakis

Oct 2018–Mar 2020 **Post-Doctoral Fellow**, *EPFL (LASA Team)*, Lausanne, Switzerland.
Research Topic: Robot Learning and Adaptation
Funding: ERC "SAHR" Project, CHIST-ERA "CORSMAL" Project
Supervisor: Aude Billard

Oct 2015–Sept 2018 **Doctoral Researcher**, *Inria (LARSEN Team)*, Nancy, France.
Research Topic: Micro-Data Reinforcement Learning for Adaptive Robots
Funding: ERC "ResiBots" Project
Supervisor: Jean-Baptiste Mouret

Sep–Dec 2017 **Teaching Assistant in Post-Graduate Real-Time Programming Course**, *UPMC - University Pierre and Marie Curie*, SPI Master, Paris, France.
The lab excercises involved the Orocos Real-Time Toolkit and Linux kernel modules.
Professor: Ludovic Saint-Bauzel

Other Work Experience

Jan–Sep 2015 **Computer/Software Engineer**, *Institute of Language and Speech Processing*, Athens, Greece, Scholarship.
Computer/Software Engineer at Institute for Language and Speech Processing, Athens. I was market researching and setting up a laboratory for multi-modal human-computer interaction based on expressive speech synthesis (robots, avatars, motion capture systems, microphone arrays, e.t.c.). My main duties involved searching for available hardware and selecting the most appropriate given specific user/scientific cases. I was, also, involved in integrating *Innoetics'* software into modules of the humanoid robot NAO and creating the infrastructure for easy code re-use.

May–Aug 2015 **Google Summer of Code 2015**, *Open Source Robotics Foundation*.
As a GSoC 2015 intern, I focused on adding more features to the core library of the *Ignition Robotics Transport Library*. The main tasks involved code restructuring using C++11 features and enabling easy code re-use and enhancing modularity. I was also involved in creating some command line tools for the library.

Mar–Jun 2014 **Intern**, *Bit My Job*, Patras, Greece.
During my internship at Bit My Job I developed a framework for Tablet (Android) to Server (Java) communication for live-scoring purposes in shooter tournaments. Also, I created several websites using PHP, Joomla or Wordpress. My internship had a duration of 3 months.

Miscellaneous

Nov–Dec 2013 **Programmer**, *Laboratory for Manufacturing Systems & Automation*, University of Patras, Greece.
Worked on CAPP 4 SMEs European Project. I was developing 3D/2D simulation (using Java and OpenGL) and a Web Application (using Ruby on Rails).

July 2010–June 2015 **Coach**, *Table Tennis Academy "Anagennisi Patron"*, Rion, Greece.
I was the head coach of the Table Tennis Academy "Anagennisi Patron".

Publications

Peer-Reviewed Journal Papers

2023 **Online Damage Recovery for Physical Robots with Hierarchical Quality-Diversity**, *Maxime Allard, Simón C. Smith, Konstantinos Chatzilygeroudis, Bryan Lim and Antoine Cully*, ACM Transactions on Evolutionary Learning and Optimization.

Self-Correcting Quadratic Programming-Based Robot Control, *Farshad Khadivar*[*], *Konstantinos Chatzilygeroudis*[*] and Aude Billard*, IEEE Transactions on Systems, Man, and Cybernetics: Systems.

[*] Equal contribution

2022 **Behavior Policy Learning: Learning Multi-Stage Tasks via Solution Sketches and Model-Based Controllers**, *Konstantinos Tsinganos*[*], *Konstantinos Chatzilygeroudis*[*], Denis Hadjivelichkov, Theodoros Komninos, Evangelos Dermatas and Dimitrios Kanoulas*, Frontiers in Robotics & AI.

[*] Equal contribution

2020 **Robust Reinforcement Learning with Bayesian Optimisation and Quadrature**, *Supratik Paul, Konstantinos Chatzilygeroudis, Kamil Ciosek, Jean-Baptiste Mouret, Michael Osborne and Shimon Whiteson*, Journal of Machine Learning Research (JMLR): Special Issue on Bayesian Optimization.

Benchmark for Bimanual Robotic Manipulation of Semi-deformable Objects, *Konstantinos Chatzilygeroudis, Bernardo Fichera, Ilaria Lauzana, Fanjun Bu, Kunpeng Yao, Farshad Khadivar and Aude Billard*, IEEE Robotics and Automation Letters: Special Issue on Benchmarking Protocols for Robotic Manipulation.

Benchmark for Human-to-Robot Handovers of Unseen Containers with Unknown Filling, *Ricardo Sanchez-Matilla*[*], *Konstantinos Chatzilygeroudis*[*], Apostolos Modas, Nuno Ferreira Duarte, Alessio Xompero, Pascal Frossard, Aude Billard and Andrea Cavallaro*, IEEE Robotics and Automation Letters: Special Issue on Benchmarking Protocols for Robotic Manipulation.

[*] Equal contribution

2019 **A survey on policy search algorithms for learning robot controllers in a handful of trials**, *Konstantinos Chatzilygeroudis, Vassilis Vassiliades, Freek Stulp, Sylvain Calinon and Jean-Baptiste Mouret*, IEEE Transactions on Robotics.

2018 **Reset-free Trial-and-Error Learning for Robot Damage Recovery**, *Konstantinos Chatzilygeroudis, Vassilis Vassiliades and Jean-Baptiste Mouret*, Robotics and Autonomous Systems.

Limbo: A Flexible High-performance Library for Gaussian Processes modeling and Data-Efficient Optimization, *Antoine Cully, Konstantinos Chatzilygeroudis, Federico Allocati and Jean-Baptiste Mouret*, The Journal of Open Source Software.

2017 **Using Centroidal Voronoi Tessellations to Scale Up the Multi-dimensional Archive of Phenotypic Elites Algorithm**, *Vassilis Vassiliades, Konstantinos Chatzilygeroudis and Jean-Baptiste Mouret*, IEEE Transactions on Evolutionary Computation.

Peer-Reviewed Book Chapters

2021 **Quality-Diversity Optimization: a novel branch of stochastic optimization**, *Konstantinos Chatzilygeroudis, Antoine Cully, Vassilis Vassiliades and Jean-Baptiste Mouret*, Black Box Optimization, Machine Learning and No-Free Lunch Theorems, Springer series SOIA.
Edited by: Panos Pardalos, Michael Vrahatis, Varvara Rasskazova.

Machine Learning Basics, *Konstantinos Chatzilygeroudis, Ioannis Hatzilygeroudis and Isidoros Perikos*, Intelligent Computing for Interactive System Design: Statistics, Digital Signal Processing and Machine Learning in practice, ACM.
Edited by: Andreas Komninos, Parisa Eslambolchilar, Mark Dunlop.

Peer-Reviewed Conference Papers

Jul 2023 **Evolving Dynamic Locomotion Policies in Minutes**, *Konstantinos Chatzilygeroudis, Constantinos Tsakonas and Michael Vrahatis*, The Fourteenth International Conference on Information, Intelligence, Systems and Applications (IISA 2023), Volos, Greece.

Jul 2023 **Effective Skill Learning via Autonomous Goal Representation Learning**, *Constantinos Tsakonas and Konstantinos Chatzilygeroudis*, The Fourteenth International Conference on Information, Intelligence, Systems and Applications (IISA 2023), Volos, Greece.

Jun 2023 **Fast and Robust Constrained Optimization via Evolutionary and Quadratic Programming**, *Konstantinos Chatzilygeroudis and Michael Vrahatis*, The 17th Learning and Intelligent Optimization Conference (LION), Nice, France.

Dec 2022 **Skill-based Multi-objective Reinforcement Learning of Industrial Robot Tasks with Planning and Knowledge Integration**, *Matthias Mayr, Faseeh Ahmad, Konstantinos Chatzilygeroudis, Luigi Nardi and Volker Krueger*, IEEE International Conference on Robotics and Biomimetics (ROBIO 2022), Xishuangbanna, China (Hybrid).

Aug 2022 **Learning Skill-based Industrial Robot Tasks with User Priors**, *Matthias Mayr, Carl Hvarfner, Konstantinos Chatzilygeroudis, Luigi Nardi and Volker Krueger*, IEEE International Conference on Automation Science and Engineering (CASE 2022), Mexico City, Mexico (Hybrid).

Jul 2022 **Hierarchical Quality-Diversity for Online Damage Recovery**, *Maxime Allard, Simón C. Smith, Konstantinos Chatzilygeroudis and Antoine Cully*, The Genetic and Evolutionary Computation Conference (GECCO 2022), Boston, USA, **Best Paper Award at Complex Systems Track**.

Jun 2022 **A Brief Survey of Sim2Real Methods for Robot Learning**, *Konstantinos Dimitropoulos, Ioannis Hatzilygeroudis and Konstantinos Chatzilygeroudis*, Proceedings of the 31st International Conference on Robotics in Alpe-Adria-Danube Region, Klagenfurt am Wörthersee, Austria.

Sept 2021 **Learning of Parameters in Behavior Trees for Movement Skills**, *Matthias Mayr, Konstantinos Chatzilygeroudis, Faseeh Ahmad, Luigi Nardi and Volker Krueger*, IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), Prague (Virtual).

Jun 2021 **Feature Selection in single-cell RNA-seq data via a Genetic Algorithm**, *Konstantinos Chatzilygeroudis, Aristidis Vrahatis, Sotiris Tasoulis and Michael Vrahatis*, The 15th Learning and Intelligent Optimization Conference (LION), Greece (Virtual).

Oct 2020 **From human action understanding to robot action execution: how the physical properties of handled objects modulate non-verbal cues**, *Nuno Ferreira Duarte, Konstantinos Chatzilygeroudis, José Santos-Victor and Aude Billard*, Proceedings of the Joint IEEE International Conference on Development and Learning and on Epigenetic Robotics (ICDL-EpiRob), Chile (Virtual).

Oct 2019 **On Force Synergies in Human Grasping Behavior**, *Julia Starke, Konstantinos Chatzilygeroudis, Aude Billard and Tamim Asfour*, Proceedings of the International Conference on Humanoid Robots, Toronto, Canada.

Oct 2018 **Multi-objective Model-based Policy Search for Data-efficient Learning with Sparse Rewards**, *Rituraj Kaushik, Konstantinos Chatzilygeroudis and Jean-Baptiste Mouret*, Proceedings of the Conference on Robot Learning (CoRL 2018), Zurich, Switzerland.

May 2018 **Using Parameterized Black-Box Priors to Scale Up Model-Based Policy Search for Robotics**, *Konstantinos Chatzilygeroudis and Jean-Baptiste Mouret*, Proceedings of the International Conference on Robotics and Automation (ICRA 2018), Brisbane, Australia.

May 2018 **Bayesian Optimization with Automatic Prior Selection for Data-Efficient Direct Policy Search**, *Rémi Pautrat, Konstantinos Chatzilygeroudis and Jean-Baptiste Mouret*, Proceedings of the International Conference on Robotics and Automation (ICRA 2018), Brisbane, Australia.
A short version of the paper was accepted at the non-archival track of the 1st Conference on Robot Learning (CoRL) 2017.

Feb 2018 **Alternating Optimisation and Quadrature for Robust Control**, *Paul Supratik, Konstantinos Chatzilygeroudis, Kamil Ciosek, Jean-Baptiste Mouret, Michael A. Osborne and Shimon Whiteson*, Proceedings of the Thirty-Second AAAI Conference on Artificial Intelligence (AAAI 2018), New Orleans, Louisiana, USA.

Sept 2017 **Black-Box Data-efficient Policy Search for Robotics**, *Konstantinos Chatzilygeroudis, Roberto Rama, Rituraj Kaushik, Dorian Goepp, Vassilis Vassiliades and Jean-Baptiste Mouret*, Proceedings of the International Conference on Intelligent Robots and Systems (IROS), Vancouver, BC, Canada.

May 2015 **Human robot collaboration for folding fabrics based on force/RGB-D feedback**, *Panagiotis Koustoumpardis, Konstantinos Chatzilygeroudis, Aris Synodinos and Nikos Aspragathos*, Proceedings of the 24th International Conference on Robotics in Alpe-Adria-Danube Region, Bucharest, Romania, Pages: 235-243.

Peer-Reviewed Workshop Papers

May 2023 **End-to-End Stable Imitation Learning via Autonomous Neural Dynamic Policies**, *Dionis Totsila*, Konstantinos Chatzilygeroudis*, Denis Hadjivelichkov, Valerio Modugno, Ioannis Hatzilygeroudis and Dimitrios Kanoulas*, Life-Long Learning with Human Help (L3H2) Workshop at IEEE International Conference on Robotics and Automation (ICRA 2023).

* Equal contribution

Oct 2022 **Combining planning, reasoning and reinforcement learning to solve industrial robot tasks**, *Matthias Mayr, Faseeh Ahmad, Konstantinos Chatzilygeroudis, Luigi Nardi and Volker Krueger*, 2nd Workshop on Trends and Advances in Machine Learning and Automated Reasoning for Intelligent Robots and Systems, at IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS 2022).

June 2022 **How to set up & learn new robot tasks with explainable behaviors?**, *Matthias Mayr, Faseeh Ahmad, Konstantinos Chatzilygeroudis, Luigi Nardi and Volker Krueger*, European Robotics Forum, Rotterdam, Netherlands.

July 2017 **20 Years of Reality Gap: a few Thoughts about Simulators in Evolutionary Robotics**, *Jean-Baptiste Mouret and Konstantinos Chatzilygeroudis*, Proceedings of the International Workshop "Simulation in Evolutionary Robotics" at the Genetic and Evolutionary Computation Conference (GECCO).

July 2017 **Comparing multimodal optimization and illumination**, *Vassilis Vassiliades, Konstantinos Chatzilygeroudis and Jean-Baptiste Mouret*, Proceedings of the Genetic and Evolutionary Computation Conference (GECCO) (Poster-only papers), Berlin, Germany.

July 2017 **A comparison of illumination algorithms in unbounded spaces**, *Vassilis Vassiliades, Konstantinos Chatzilygeroudis and Jean-Baptiste Mouret*, Proceedings of the International Workshop "Measuring and Promoting Diversity in Evolutionary Algorithms" at the Genetic and Evolutionary Computation Conference (GECCO).

Dec 2016 **Safety-Aware Robot Damage Recovery Using Constrained Bayesian Optimization and Simulated Priors**, *Vaios Papaspyros, Konstantinos Chatzilygeroudis, Vassilis Vassiliades and Jean-Baptiste Mouret*, BayesOpt 2016: Proceedings of the International Workshop on "Bayesian Optimization" at NIPS 2016.

May 2016 **Towards semi-episodic learning for robot damage recovery**, *Konstantinos Chatzilygeroudis, Antoine Cully and Jean-Baptiste Mouret*, AILTA '16: Proceedings of the International Workshop "AI for Long-term Autonomy" at ICRA 2016.

Teaching

Independent Teaching

2022-23 - **Introduction to Programming**: master course in the Interdepartmental Postgraduate Programme "Life Sciences Informatics" (LSI), University of Patras, Greece

2021-22 - **Introduction to Artificial Intelligence**: undergraduate course at the Computer Engineering and Informatics Department (CEID), University of Patras, Greece

- **Intelligent Systems and Robotics**: undergraduate course at the Computer Engineering and Informatics Department (CEID), University of Patras, Greece

- **Artificial Intelligence, Machine Learning and applications**: master course in the Interdepartmental Postgraduate Programme "Life Sciences Informatics" (LSI), University of Patras, Greece

2020-21 - **Introduction to Artificial Intelligence**: undergraduate course at the Computer Engineering and Informatics Department (CEID), University of Patras, Greece

- **Intelligent Systems and Robotics**: undergraduate course at the Computer Engineering and Informatics Department (CEID), University of Patras, Greece

- **Artificial Intelligence, Machine Learning and applications**: master course in the Interdepartmental Postgraduate Programme "Life Sciences Informatics" (LSI), University of Patras, Greece

Non-Independent Teaching

2021-22 - **Introduction to Programming (Python)**: external teaching collaborator for the laboratory course in Hellenic Open University, Greece

Supervision

Master Students

2020 - **Konstantinos Tsinganos** - Co-supervision with Prof. Evangelos Dermatas of the master thesis at CEID (Univ. of Patras) entitled: *"Sim2Real Methods for Visual-Based Imitation Learning"*, Oct 2020 — Sept 2021

2019 - **Andrea Mussati** - Co-supervision with Prof. Aude Billard of the master thesis at *EPFL* entitled: *"Effective Exploration in Robotics through Equal-Opportunity Growth of Sub-populations"*, Oct 2019 — Feb 2020

Undergraduate Students

2022-23 - **Ioannis Tsikelis** - Co-supervision with Prof. Emmanouil Psarakis of the diploma thesis at CEID (Univ. of Patras) entitled: *"Trajectory Optimization for Robot Motion Planning"*, Feb 2023 — Sept 2023 (expected)

- **Dionis Totsila** - Co-supervision with Prof. Ioannis Hatzilygeroudis of the diploma thesis at CEID (Univ. of Patras) entitled: *"Stable Reinforcement Learning for Continuous Control using Dynamical System-Based Policies"*, Sept 2022 — Jun 2023

- **Michael Siragas** - Co-supervision with Prof. Ioannis Hatzilygeroudis of the diploma thesis at CEID (Univ. of Patras) entitled: *"Robot Learning via Model-Based Reinforcement Learning"*, Sept 2022 — Jun 2023

- **Ioannis Prokopiou** - Co-supervision with Prof. Evangelos Dermatas of the diploma thesis at CEID (Univ. of Patras) entitled: *"Imitation Learning with Vision Transformers"*, Oct 2021 — Jun 2023

2021-22 - **Agisilaos Kounelis** - Co-supervision with Prof. Evangelos Dermatas of the diploma thesis at CEID (Univ. of Patras) entitled: *"Privileged Learning Techniques for Learning Robot Controllers"*, Oct 2021 — Nov 2022

- **Christodoulos Kosta** - Co-supervision with Prof. Evangelos Dermatas of the diploma thesis at CEID (Univ. of Patras) entitled: *"Experimenting with Sim2Real Methods in Robotics Tasks"*, Feb 2021 — Feb 2022

- **Dimosthenis Stergiopoulos** - Co-supervision with Prof. Evangelos Dermatas of the diploma thesis at CEID (Univ. of Patras) entitled: *"Experimental Comparison of Reinforcement Learning Algorithms in Robotics Tasks"*, Feb 2021 — Nov 2022

- **Pavlos Konstantinou** - Co-supervision with Prof. Evangelos Dermatas of the diploma thesis at CEID (Univ. of Patras) entitled: *"Implementation of Reinforcement Learning Algorithms in C++"*, Feb 2021 — Nov 2022

- **Apostolos Ritsikalis** - Co-supervision with Prof. Evangelos Dermatas of the diploma thesis at CEID (Univ. of Patras) entitled: *"Modeling Robotic Systems via Neural Networks"*, Feb 2021 — Nov 2022

Scientific Activities

Grants

Oct 2022-Now **Principal Investigator** of the project "Novel Optimization Methods for Autonomous Skill Learning in Robotics" funded by the Hellenic Foundation for Research and Innovation (H.F.R.I.) for a period of 2 years. **Host Institution:** Department of Mathematics, University of Patras. **Total funding:** 107.153,00€.

Chair in Technical Committees

Mar 2022-Now - **IEEE-RAS Technical Committee on Model-Based Optimization for Robotics** - Invited to serve as a **Associate Co-Chair** by the board of the technical committee.

Invited Lectures/Talks

Dec 2021 - **4th Robot Learning Workshop** (NeurIPS) - Invited to give a talk on *"Data-efficient trial & error adaptation"* with Jean-Baptiste Mouret at the *4th Robot Learning Workshop* at NeurIPS 2021

Apr 2021 - **RLVS** - Invited to give a 2 hour lecture on *"Micro-Data Policy Search"* with Jean-Baptiste Mouret at the *Reinforcement Learning Virtual School* (RLVS)

March 2021 - **CEID Social Hour** - Invited to give an 1 hour talk on *"Micro-Data Reinforcement Learning for Adaptive Robots"* at the 26/03/2021 CEID Social Hour event

Special Issue/Workshop Organizer

- **LION17** - ***Organizer of a Special Session*** *on "Learning and Intelligent Optimization for Physical Systems"* (2023), *Co-organized with Michael N. Vrahatis*

- **Frontiers in Robotics and AI** - ***Guest Editor of a Special Issue*** *on "Sim2Real Robot Learning and Control with Realistic Observations"* (2020-2021), *Co-organized with Sylvain Calinon and Dimitrios Kanoulas*

Editorship & Program Committee Member

- **IROS** - *one of the top conferences in robotics* (**Associate Editor**) (2020-2023): *invited by Freek Stulp, by Jens Kober and by Urbano J. Nunes*

- **CoRL** - *one of the top conferences in robot learning* (**Chair for the Virtual part of the conference**) (2021): *invited by Raia Hadsell*

- **Frontiers in Robotics and AI** - ***Review Editor*** *in the Field Robotics section of the journal* (2020-)

- **IJCAI** - *one of the top conferences in AI (Senior PC member)* (2021-2023)

- **LION** - *learning and intelligent optimization conference (PC member)* (2023)

- **AAMAS** - *one of the top conferences in learning systems (PC member)* (2021)

- **RSS** - *one of the top conferences in robotics (PC member)* (2020)

- **GECCO** - *one of the top conferences in evolutionary computation (PC member)* (2020, 2023)

- **IISA** - *conference on information, intelligence, systems and applications (PC member)* (2019)

Reviewer

- **NeurIPS** - *one of the top conferences in machine learning* (2022, 2023)

- **ICML** - *one of the top conferences in machine learning* (2023)

- **ICLR** - *one of the top conferences in machine learning* (2022)

- **IJARS** - *International Journal of Advanced Robotic Systems* (2022)
- **ICAR** - *robotics conference* (2021)
- **AAMAS** - *one of the top conferences in learning systems* (2021)
- **SP-L** - *ieee signal processing letters (journal)* (2020)
- **NatMachInt** - *nature machine intelligence (journal)* (2020)
- **T-RO** - *ieee transactions on robotics (journal)* (2019-2023)
- **ICRA** - *one of the top conferences in robotics* (2016, 2017, 2019-2023)
- **RSS** - *one of the top conferences in robotics* (2020)
- **IROS** - *one of the top conferences in robotics* (2019-2023)
- **GECCO** - *one of the top conferences in evolutionary algos* (2020, 2023)
- **CoRL** - *robot learning conference* (2018-2021)
- **RA-L** - *robotics and automation letters (journal)* (2017-2022)
- **JOCSCI** - *Journal of Computational Science* (2023)
- **COMIND** - *Computers in Industry (journal)* (2020)
- **IJAIT** - *journal on artificial intelligence tools* (2017, 2023)
- **JOSS** - *the journal of open source software* (2018)
- **IISA** - *conference on information, intelligence, systems and applications* (2019)
- **BayesOpt** - *international workshop on bayesian optimization (at NIPS)* (2018)
- **HFR** - *international workshop on human-friendly robotics* (2017)
- **IFAC** - *world congress on automatic control* (2017)
- **ReMAR** - *conference on reconfigurable mechanisms and robots* (2016)

Open Source Activities

I have contributed in several open-source projects including:

limbo *Main developer and maintainer*. Limbo is an open-source C++11 library for Gaussian Processes and data-efficient optimization (e.g., Bayesian optimization) that is designed to be both highly flexible and very fast.

robot_dart *Main developer and maintainer*. robot_dart is an open-source C++11 generic wrapper around the DART robotics simulator for easier and faster usage.

iiwa_ros *Main developer and maintainer*. iiwa_ros contains ROS packages to integrate KUKA's IIWA robots in ROS. This is achieved through the KUKA's Fast Research Interface (FRI) and makes it possible for up to 1KHz control (in torque or position control mode).

roboticsgroup_gazebo_plugins *Main developer and maintainer*. roboticsgroup_gazebo_plugins is a collection of Gazebo plugins; most notably the *MimicJointPlugin*.

DART *Bug reports and fixes*. DART (Dynamic Animation and Robotics Toolkit) is a collaborative, cross-platform, open source library that provides data structures and algorithms for kinematic and dynamic applications in robotics and computer animation.

dynamixel_control_hw *Developer*. dynamixel_control_hw provides a hardware interface for ROS control. Its aim is to allow generic software controllers to control a set of Dynamixel actuators.

Magnum *Added DART Integration and bug fixes*. Magnum is a lightweight and modular C++11/C++14 graphics middleware for games and data visualization.

Ignition Transport *GSoC 2015*. Ignition transport is a component in the ignition framework, a set of libraries designed to rapidly develop robot applications.

A full list of the projects that I am involved in can be found in my GitHub and bitbucket accounts (*costashatz* username).

PhD Thesis

Title *Micro-Data Reinforcement Learning for Adaptive Robots*

Supervisor Dr. Jean-Baptiste Mouret

Description *Robots have to face the real world, in which trying something might take seconds, hours, or even days. Unfortunately, the current state-of-the-art reinforcement learning algorithms (e.g., deep reinforcement learning) require big interaction times to find effective policies. In this thesis, we explored approaches that tackle the challenge of learning by trial-and-error in a few minutes on physical robots. We call this challenge "micro-data reinforcement learning". Throughout this thesis, our goal was to design algorithms that work on physical robots, and not only in simulation. Consequently, all the proposed approaches have been evaluated on at least one physical robot. Overall, this thesis aimed at providing methods and algorithms that will allow physical robots to be more autonomous and be able to learn in a handful of trials.*

Videos http://costashatz.github.io/videos.html

Codes https://github.com/resibots

Diploma Thesis

Title *Navigation of Humanoid Robot Nao In Unknown Space With Dynamic Obstacles*

Supervisors Professor Nikos Aspragathos & Professor Emmanouil Psarakis & PhDc Aris Synodinos

Description This thesis dealt with all the fields that give the ability to humanoid robots to move autonomously in a previously unknown space. It was, mainly, a software development project with a brief bibliographic overview of the major algorithms and techniques in each individual field. The "small" humanoid NAO (from Aldebaran Robotics) was used for the experiments and ROS (Robot Operating System) as the programming framework.

Grade 10/10

Video **NAO Walking in Gazebo:** *https://www.youtube.com/watch?v=xPg7cal26Z4*

Code *https://github.com/costashatz/nao_dcm*

https://github.com/costashatz/nao_gazebo

Honors & Awards

April 2022 **Hellenic Foundation for Research and Innovation (H.F.R.I.)**.
The proposal for the project *"Novel Optimization Methods for Autonomous Skill Learning in Robotics"* ranked 3rd out of 47 submitted projects in the field of "Mathematics & Information Sciences" of the *3rd Call for H.F.R.I. Research Projects to support Postdoctoral Researchers*. The project got funded for a total of 107.153,00€ (only 4 projects got funded in the call).

July 2022 **The Genetic and Evolutionary Computation Conference (GECCO 2022)**.
Best Paper Award at Complex Systems Track for the paper Hierarchical Quality-Diversity for Online Damage Recovery

December 2014 **Computer Engineering and Informatics Department Graduation**.
Ranked **9th with GPA 8.25/10** amongst 250 students that graduated from the Computer Engineering and Informatics Department of University of Patras in 2014.

August 2009 **Greek National Exams - Admission Exams**.
Ranked **1st in admission exams** for the Computer Engineering and Informatics Department of University of Patras among 250 students who succeeded.

May 2010 **Microsoft Imagine Cup Competition**.
Ranked among the **150 best teams** with team TTD (as a game designer/developer) at the Game Development part of the International "Imagine Cup 2010" competition (organized by Microsoft) with the project/game *Spring*.

Personal Data

Place/Date of Birth	Nottingham, UK | 5 February 1991
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Linked-In	konstantinoschatzilygeroudis

Languages

Greek	**Native**	
English	**Full professional proficiency**	*Fluent both in oral and written (C2)*
French	**Limited working proficiency**	*Basic oral and written skills (B2)*