Konstantinos Chatzilygeroudis

Curriculum Vitae

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At a glance

Current Position	**Post-Doctoral Fellow** at **LASA** - **EPFL**, Switzerland
Education	**PhD in Robotics/Machine Learning**
Honors	Ranked in **top 5%** at **Computer Science and Engineering 2014 Graduation**
Experience	**Google Summer of Code Intern for Open Source Robotics Foundation**
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 Science and Engineering**, *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

Experience

Vocational

October 2018–present **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

September–December 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

January–September 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–August 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.

March–June 2015 **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 Journals

2018 **Reset-free Trial-and-Error Learning for Robot Damage Recovery**, *Konstantinos Chatzilygeroudis, Vassilis Vassiliades, 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, 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, Jean-Baptiste Mouret*, IEEE Transactions on Evolutionary Computation.

Peer-Reviewed Conferences

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, 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, Nikos Aspragathos*, Proceedings of the 24th International Conference on Robotics in Alpe-Adria-Danube Region, Bucharest, Romania, Pages: 235-243.

Peer-Reviewed Workshops

July 2017 **20 Years of Reality Gap: a few Thoughts about Simulators in Evolutionary Robotics**, *Jean-Baptiste Mouret, 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, 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, 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, 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, Jean-Baptiste Mouret*, AILTA '16: Proceedings of the International Workshop "AI for Long-term Autonomy" at ICRA 2016.

Reviewer

- **ICRA** - *one of the top conferences in robotics* (2016, 2017, 2019)

- **IROS** - *one of the top conferences in robotics* (2019)
- **CoRL** - *robot learning conference* (2018)
- **RA-L** - *robotics and automation letters (journal)* (2017-2019)
- **IJAIT** - *journal on artificial intelligence tools* (2017)
- **JOSS** - *the journal of open source software* (2018)
- **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.
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

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*.

Skills

Intermediate Ruby, Screw Theory, XNA, DirectX10, OpenGL, MATLAB/Octave, MVC Web Development with Ruby on Rails or PHP, LaTeX, Javascript/jQuery, Android, HTML5/CSS

Advanced C/C++, Robotics Operating System (ROS), Java, C#, Python, Object Oriented Design & Programming, Game-Graphics Programming, Math for 2D/3D Graphics

Personal Data

Place/Date of Birth	Nottingham, UK | 5 February 1991
Citizenship	Greek
Marital Status	Married
Address	Lausanne, Switzerland
Phone	+41 78 303 64 40
Website	http://costashatz.github.io/
E-mail	konstantinos.chatzilygeroudis@epfl.ch, costashatz@gmail.com
Google Scholar	Konstantinos Chatzilygeroudis *(user=tnf6B-EAAAAJ)*
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)*

Interests

- Artificial Intelligence
- Machine Learning
- Table Tennis
- Robotics
- Programming
- Drawing