

Athanasios Polydoros

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		Nationality	Greek
		Date of Birth	29 th September 1987

Research Interests

Machine Learning Bayesian Methods
Robot Learning Deep Learning
Reinforcement Learning Industrial Robotics

Academic Positions

2017-Today Postdoctoral Researcher - University of Innsbruck, AT
Research: *Movement Primitives and Reinforcement Learning*

Education

2013-2017 Ph.D. Fellow -Aalborg University, DK
Thesis: *Online Learning of Industrial Manipulators' Dynamics Models*

2012-2013 M.Sc. Artificial Intelligence with Distinction - University of Edinburgh, UK
Thesis: *Effect of Internal Models on Homeokinetic Controlled Autonomous Robots*

2005-2011 B.Sc./M.Sc. Production Engineering - Democritus University of Thrace, GR
Thesis: *System modeling and pattern recognition using Hebbian Learning*

Projects

2017 -Today FlexRoP – Flexible, assistive robot for the customized production.
Funding: FFG (Austria)
Role: Investigator
Duties: Kinesthetic teaching, Motion verification and optimization

2018 -Today IMAGINE – Robots Understanding Their Actions by Imagining Their Effects
Funding: EU H2020
Role: Investigator
Duties: Optimization of actions via reinforcement learning

2013 -2017 STAMINA – Sustainable and Reliable Robotics for Part Handling in Manufacturing Automation
Funding: EU-FP7
Role: Researcher
Duties: Dynamics Model learning for control

Teaching & Supervision:

Courses:

- 2017** Odometry for Intelligent Robots
B.Sc. Computer Science – University of Innsbruck
- 2015 - 2016** Introduction to Data Mining & Machine Learning
M.Sc Global System Design – Aalborg University
- 2015** Introduction to Matlab
M.Sc Global System Design – Aalborg University

Seminars:

- 2017** Autonomous & Intelligent Systems
B.Sc. Computer Science – University of Innsbruck
- Fall 2016** Programming Universal Robots with URmat
M.Sc. Global Systems Design – Aalborg University

Supervision:

- 2017 – Today** Xiang Zang, Ph.D. Student.
Co-supervised with Prof. Justus Piater at Intelligent and Interactive System's Group University of Innsbruck
- 2014 – 2017** Multiple Students' Semester Projects,
Aalborg University

Publications

Journals

- [J1] Athanasios S Polydoros and Lazaros Nalpantidis. Survey of model-based reinforcement learning: Applications on robotics. *Journal of Intelligent & Robotic Systems*, 86(2):153–173, 2017.
- [J2] George A Papakostas, Dimitris E Koulouriotis, Athanasios S Polydoros, and Vassilios D Tourassis. Towards hebbian learning of fuzzy cognitive maps in pattern classification problems. *Expert Systems with Applications*, 39(12):10620–10629, 2012.

Conferences & Workshops

- [C3] Athanasios S Polydoros, Evangelos Boukas, and Lazaros Nalpantidis. Online multi-target learning of inverse dynamics models for computed-torque control of compliant manipulators. In *Intelligent Robots and Systems (IROS), 2017 IEEE/RSJ International Conference on*, pages 4716–4722. IEEE, 2017.
- [C4] Evangelos Boukas, Athanasios S Polydoros, Gianfranco Visentin, Lazaros Nalpantidis, and Antonios Gasteratos. Global localization for future space exploration rovers. In *International Conference on Computer Vision Systems*, pages 86–98. Springer, 2017.
- [C5] Athanasios S Polydoros and Lazaros Nalpantidis. A reservoir computing approach for learning forward dynamics of industrial manipulators. In *Intelligent Robots and Systems (IROS), 2016 IEEE/RSJ International Conference on*, pages 612–618. IEEE, 2016.
- [C6] Athanasios S Polydoros, Bjarne Grossmann, Francisco Rovida, Lazaros Nalpantidis, and Volker Kruger. Accurate and versatile automation of industrial kitting operations with SkiROS,. In *17th Conference Towards Autonomous Robotic Systems (TAROS), (Sheffield, UK)*, 2016.

- [C7] Athanasios S Polydoros, Lazaros Nalpantidis, and Volker Krüger. Real-time deep learning of robotic manipulator inverse dynamics. In *Intelligent Robots and Systems (IROS), 2015 IEEE/RSJ International Conference on*, pages 3442–3448. IEEE, 2015.
- [C8] Athanasios S Polydoros, Lazaros Nalpantidis, and Volker Krüger. Advantages and limitations of reservoir computing on model learning for robot control. In *2nd International Workshop on Machine Learning for Planning and Control, IROS Hamburg*, 2015.
- [C9] Athanasios Polydoros, Lazaros Nalpantidis, and Volker Krüger. Towards an intelligent robotic manipulator for industrial object-placing tasks. In *International Workshop on Intelligent Robot Assistants*, 2014.
- [C10] Athanasios S Polydoros, Lazaros Nalpantidis, and Volker Krüger. A roadmap towards intelligent and autonomous object manipulation for assembly tasks. In *International workshop on Autonomous Grasping and Manipulation, ICRA*, 2014.
- [C11] Smith C Simon, Athanasios S Polydoros, and J M Herrmann. Internal models for self-organized robotic behavior. In *Seventh International Workshop on Guided Self-Organization*. University of Freiburg, Germany, 2014.
- [C12] George A Papakostas, Athanasios S Polydoros, Dimitris E Koulouriotis, and Vasileios D Tourassis. Training fuzzy cognitive maps by using hebbian learning algorithms: a comparative study. In *Fuzzy Systems (FUZZ), 2011 IEEE International Conference on*, pages 851–858. IEEE, 2011.

Book Chapters

- [B13] Francesco Roida, Matthew Crosby, Dirk Holz, Athanasios S Polydoros, Bjarne Großmann, Ronald PA Petrick, and Volker Krüger. SkiROS—a skill-based robot control platform on top of ROS. In *Robot Operating System (ROS)*, pages 121–160. Springer, 2017.
- [B14] GA Papakostas, AS Polydoros, DE Koulouriotis, and VD Tourassis. Evolutionary feature subset selection for pattern recognition applications. INTECH Open Access Publisher, 2011.

Theses

- [T15] Athanasios S. Polydoros. *Online Learning of Industrial Manipulators' Dynamics Models*. Ph.d. dissertation, 2017.
- [T16] Athanasios S. Polydoros. *Effect of Internal Models on Homeokinetic Controlled Autonomous Robots*, M.Sc. Thesis. M.sc. thesis, 2013.
- [T17] Athanasios S. Polydoros. *Learning Fuzzy Cognitive Maps by Using Hebbian Learning Algorithms in System Modeling and Pattern Recognition*. B.sc thesis.

Reviewer

Journals:

IEEE Robotics and Automation Letters (RAL)
Engineering Applications of Artificial Intelligence
Electronics Letters (IET)
Big Data

Conferences:

IEEE International Conference on Intelligent Robotics and Systems (IROS)
IEEE International Conference on Robotics and Automation (ICRA)

Professional Memberships

IEEE Member

Technical Chambers of Greece

Referees

Available on request