

# George P. Kontoudis

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## EDUCATION

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<b>PhD, Virginia Tech</b> Bradley Department of Electrical and Computer Engineering Advisor: Daniel J. Stilwell Tentative Dissertation Title: “Communication-Aware Approximate Gaussian Processes for Distributed Exploration” Area of Focus: Signals, Systems & Controls GPA: 3.94/4.00	2018–2021 (expected)
<b>MSc, Virginia Tech</b> Department of Mechanical Engineering Advisor: Tomonari Furukawa Co-advisor: Kyriakos G. Vamvoudakis GPA: 4.00/4.00	2016–2018
<b>Diploma (MSc), National Technical University of Athens</b> School of Mechanical Engineering Advisor: Kostas J. Kyriakopoulos Co-advisor: Minas Liarokapis Grade: 7.76/10.00 ( <i>top 20%</i> )	2012–2016
<b>BSc, University of West Attica</b> Department of Mechanical Engineering	2005–2010

## RESEARCH EXPERIENCE

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<b>Graduate Research Assistant</b> Center for Marine Autonomy & Robotics Virginia Tech	Aug 2018–present
<b>Graduate Research Assistant</b> Computational Multiphysics Systems Laboratory Virginia Tech	May 2017–Aug 2018
<b>Member &amp; Research Associate</b> The OpenBionics Initiative	Sep 2014–present
<b>Research Assistant</b> Control Systems Laboratory National Technical University of Athens	Apr 2014–Mar 2016

## TEACHING EXPERIENCE

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<b>Graduate Teaching Assistant</b> Department of Mechanical Engineering, Virginia Tech	Aug 2016–May 2017
· Lectured 80 students in a senior level, control systems lab.	Fall 2016
· Guided 20 students in a series of 8 junior level, mechanical engineering labs.	Spring 2017

## AWARDS & HONORS

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NSF Student Travel Grant (WuWNet)	2019
2×Virginia Tech GSA Travel Fund Award (Humanoids, ICORR)	2019
2×Student Travel Award (ACC)	2019, 2020
NTUA Thomaideion Award	2016

Hackaday Prize, 2 <sup>nd</sup> place (among 900 projects)	2015
Robotdalen Innovation Award, 1 <sup>st</sup> place	2015
IEEE/RAS Student Travel Award (IROS)	2015

## INDUSTRY EXPERIENCE

<b>Senior Mechanical Engineer</b> Heliix Inc., Athens, Greece	Mar 2016–Jun 2016
· Worked on the product design and development of a waste heat recovery device.	
<b>Site Supervisor</b> Sychem S.A., Athens, Greece	Sep 2013–Aug 2015
· Provided guidance to industrial maintenance crew of 6 people for a desalination plant.	
<b>Mechanical Engineer</b> Sychem S.A., Athens, Greece	Oct 2010–Sep 2013
· Monitored and commissioned desalination plants.	
<b>Aircraft Maintenance Engineer Trainee</b> Olympic Aviation, Athens, Greece	May 2008–Jan 2010
· Performed engineering work of maintenance and modifications on aircrafts.	

## PUBLICATIONS

### Referred Journal Publications

- [J1] **George P. Kontoudis**, Stephen Krauss, Daniel J. Stilwell, “Model-Based Learning of Underwater Acoustic Communication Performance for Marine Robots,” *Robotics and Autonomous Systems (RAS)*, 2021. (*minor revision*)
- [J2] **George P. Kontoudis**, Kyriakos G. Vamvoudakis, “Kinodynamic Motion Planning with Continuous-Time Q-Learning: An Online, Model-Free, and Safe Navigation Framework,” *IEEE Transactions on Neural Networks and Learning Systems (TNNLS)*, 2019.
- [J3] **George P. Kontoudis**, Minas Liarokapis, Kyriakos G. Vamvoudakis, Tomonari Furukawa, “An Adaptive Actuation Mechanism for Anthropomorphic Robot Hands,” *Frontiers in Robotics and AI*, 2019.

### Chapters in Edited Volumes

- [V1] **George P. Kontoudis**, Kyriakos G. Vamvoudakis, Zirui Xu, “RRT-QX: Real-Time Kinodynamic Motion Planning in Dynamic Environments with Continuous-Time Reinforcement Learning,” in *Brain and Cognitive Intelligence: Control in Robotics*, B. Wei (Ed.), Taylor & Francis Group, CRC Press, 2021.

### Referred Conference Publications

- [C1] Gal Gorjup, **George P. Kontoudis**, Anany Dwivedi, Geng Gao, Saori Matsunaga, Toshisada Mariyama, Bruce MacDonald, and Minas Liarokapis “Combining Programming by Demonstration with Path Optimization and Local Replanning to Facilitate the Execution of Assembly Tasks,” *IEEE International Conference on Systems, Man and Cybernetics (SMC)*, Toronto, Canada, 2020.
- [C2] **George P. Kontoudis**, Zirui Xu, Kyriakos G. Vamvoudakis, “Online, Model-Free Motion Planning in Dynamic Environments: An Intermittent, Finite Horizon Approach with Continuous-Time Q-Learning,” *American Control Conference (ACC)*, Denver, USA, 2020.
- [C3] **George P. Kontoudis**, Daniel J. Stilwell, “A Comparison of Kriging and Cokriging for Estimation of Underwater Acoustic Communication Performance,” *ACM International Conference on Underwater Networks and Systems (WuWNet)*, Atlanta, USA, 2019.
- [C4] **George P. Kontoudis**, Minas Liarokapis, Kyriakos G. Vamvoudakis, “An Adaptive, Humanlike Robot Hand with Selective Interdigitation: Towards Robust Grasping and Dexterous, In-Hand Manipulation,” *IEEE-RAS International Conference on Humanoid Robots (Humanoids)*, Toronto, Canada, 2019.

- [C5] **George P. Kontoudis**, Minas Liarokapis, Kyriakos G. Vamvoudakis, “A Compliant, Underactuated Finger for Anthropomorphic Hands,” *IEEE/RAS-EMBS Inter. Conference on Rehabilitation Robotics (ICORR)*, Toronto, Canada, 2019.
- [C6] **George P. Kontoudis**, Kyriakos G. Vamvoudakis, “Robust Kinodynamic Motion Planning using Model-Free Game-Theoretic Learning,” *American Control Conference (ACC)*, Philadelphia, USA, 2019.
- [C7] Kyriakos D. Tsoukalas, **George P. Kontoudis**, Kyriakos G. Vamvoudakis, “Active-Bayesian Learning for Cooperation Connectivity in Dynamic Cyber-Physical-Human Systems,” *IEEE Symposium on Adaptive Dynamic Programming and Reinforcement Learning (ADPRL)*, Honolulu, USA, 2017.
- [C8] **George P. Kontoudis**, Minas Liarokapis, Agisilaos G. Zisimatos, Christoforos I. Mavrogiannis, Kostas J. Kyriakopoulos, “Open-Source, Anthropomorphic, Underactuated Robot Hands with a Selectively Lockable Differential Mechanism: Towards Affordable Prostheses,” *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, Hamburg, Germany, 2015.

## Theses

- [T1] **George P. Kontoudis**, “Adaptive, Anthropomorphic Robot Hands for Grasping and In-Hand Manipulation,” *Master Thesis, Mechanical Engineering, Virginia Tech*, Blacksburg, Virginia, USA, December 2018.
- [T2] **George P. Kontoudis**, “Design and Development of an Underactuated, Anthropomorphic Robot Hand,” *Diploma Thesis, Mechanical Engineering, National Technical University of Athens*, Athens, Greece, March 2016. (in Greek)

## Technical Reports

- [R1] **George P. Kontoudis**, Minas Liarokapis, Agisilaos G. Zisimatos, Christoforos I. Mavrogiannis, Kostas J. Kyriakopoulos, “How to Create Affordable, Anthropomorphic, Light-Weight Prosthetic Hands,” *Control Systems Lab, National Technical University of Athens*, Athens, Greece, October 2015.
- [R2] Agisilaos G. Zisimatos, Minas Liarokapis, Christoforos I. Mavrogiannis, **George P. Kontoudis**, Kostas J. Kyriakopoulos, “How to Create Affordable, Modular, Light-Weight, Underactuated, Compliant Robot Hand,” *Control Systems Lab, National Technical University of Athens*, Athens, Greece, January 2015.

## SERVICE ACTIVITIES

### Reviewer, Journals

· IEEE Transactions on Neural Networks and Learning Systems (TNNLS)	2019, 2020
· IEEE Transactions on Robotics (TRO)	2020
· IEEE Transactions on Automation Science and Engineering (TASE)	2020, 2021
· IEEE Transactions on Cybernetics (TCYB)	2020
· IEEE Transactions on Systems, Man and Cybernetics: Systems (TSMCA)	2021
· IEEE Computational Intelligence Magazine (CIM)	2020
· IEEE Control Systems Letters (LCSS)	2019, 2020
· IEEE Robotics and Automation Letters (RAL)	2019
· International Journal of Advanced Robotic Systems (IJARS)	2015, 2016

### Reviewer, Conferences

· American Control Conference (ACC)	2018–2021
· IEEE International Conference on Robotics and Automation (ICRA)	2018–2021
· IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)	2018–2020
· IEEE Conference on Decision and Control (CDC)	2019, 2020
· IEEE International Conference on Automation Science and Engineering (CASE)	2019
· IEEE-RAS International Conference on Humanoid Robots (Humanoids)	2019
· IEEE International Conference on Biomedical Robotics and Biomechatronics (BioRob)	2018, 2020
· Mediterranean Conference on Control and Automation (MED)	2018

## TALKS & PRESENTATIONS

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- “Online, Model-Free Motion Planning in Dynamic Environments: An Intermittent, Finite Horizon Approach with Continuous-Time Q-Learning,” *American Control Conference (ACC)*, Denver, USA, 2020. [**Rapid-Interactive Presentation**]
- “A Comparison of Kriging and Cokriging for Estimation of Underwater Acoustic Communication Performance,” *ACM International Conference on Underwater Networks and Systems (WuWNet)*, Atlanta, USA, 2019. [**Oral Presentation**]
- “An Adaptive, Humanlike Robot Hand with Selective Interdigitation: Towards Robust Grasping and Dexterous, In-Hand Manipulation,” *Workshop on New Challenges in Humanoid Grasping and Manipulation in IEEE-RAS International Conference on Humanoid Robots (Humanoids)*, Toronto, Canada, 2019. [**Oral Presentation - Invited Talk**]
- “An Adaptive, Humanlike Robot Hand with Selective Interdigitation: Towards Robust Grasping and Dexterous, In-Hand Manipulation,” *IEEE-RAS International Conference on Humanoid Robots (Humanoids)*, Toronto, Canada, 2019. [**Poster Presentation**]
- “Robust Kinodynamic Motion Planning using Model-Free Game-Theoretic Learning,” *American Control Conference (ACC)*, Philadelphia, USA, 2019. [**Oral Presentation**]
- “A Compliant, Underactuated Finger for Anthropomorphic Hands,” *IEEE/RAS-EMBS International Conference on Rehabilitation Robotics (ICORR)*, Toronto, Canada, 2019. [**Poster Presentation**]
- “Adaptive, Anthropomorphic Robot Hands for Grasping and In-Hand Manipulation,” *Department of Mechanical Engineering, Virginia Tech*, Blacksburg, Virginia, USA, December 2018. [**Master’s Defense**]
- “Evaluation Strategies of Adaptive, Anthropomorphic Robot Hands for Dexterous In-Hand Manipulation: Early Results,” *National Institute of Standards and Technology (NIST)*, USA, 2018. [**Invited Talk**]
- “Open-Source, Anthropomorphic, Underactuated Robot Hands with a Selectively Lockable Differential Mechanism: Towards Affordable Prostheses,” *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, Hamburg, Germany, 2015. [**Oral Presentation**]

## MENTORING

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### Master’s Students

- Zirui Xu, Georgia Institute of Technology 2018–2020  
Advisor: Kyriakos G. Vamvoudakis  
Next position: PhD student at University of Maryland

## SKILLS

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<b>Languages</b>	English, Greek (native)
<b>Operating Systems</b>	Windows, Linux, ROS
<b>Design &amp; Simulation Software</b>	Solidworks, AutoCAD, ANSYS
<b>Programming</b>	MATLAB, R, Python, Julia, C/C++, HTML/CSS, L <sup>A</sup> T <sub>E</sub> X
<b>Other Skills</b>	3D printing, Laser cutting

## MEMBERSHIPS & SOCIETIES

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### Memberships

- IEEE, Student Member 2015–present
- ASME, Student Member 2016–present
- SIAM, Student Member 2019–present

### Societies

- IEEE, Robotics and Automation Society (RAS) 2015–present
- IEEE, Control Systems Society (CSS) 2017–present

## RELEVANT GRADUATE COURSEWORK (VIRGINIA TECH)

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<b>Control</b>	AOE5244: Optimization Techniques, AOE5984-SS: Cyber-Physical Systems & Distributed Control, AOE5774: Nonlinear Systems Theory, AOE6544: Linear Control Theory, ME6574: Adaptive Control Systems
<b>Robotics</b>	ECE5984-SS: Advanced Robot Motion Planning, ME5984-SS: Advanced Experimental Robotics, ME5524: Bayesian Robotics, ECE5984-SS: Autonomous Coordination, ME5984-SS: Motion Planning Analysis
<b>Dynamics</b>	AOE5204: Vehicle Dynamics & Control
<b>Mathematics</b>	MATH5414: Model Reduction of Dynamical Systems, MATH3324: Advanced Calculus
<b>Others</b>	STAT5544: Spatial Statistics, AOE5984: Scientific Machine Learning & Uncertainty Quantification ECE5644: Game Theory for Communication Networks