George P. Kontoudis

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EDUCATION

PhD, Virginia Tech *2018–2021 (expected)*
Bradley Department of Electrical and Computer Engineering
Advisor: Daniel J. Stilwell
Tentative Dissertation Title: "Communication-Aware Approximate Gaussian Processes for Distributed Exploration"
Committee Members: Daniel J. Stilwell (Chair), Ryan Williamns, Walid Saad, Craig Woolsey, and Pratap Tokekar
Area of Focus: Signals, Systems & Controls
GPA: 3.94/4.00

MSc, Virginia Tech *2016–2018*
Department of Mechanical Engineering
Advisor: Tomonari Furukawa
Co-advisor: Kyriakos G. Vamvoudakis
GPA: 4.00/4.00

Diploma, National Technical University of Athens *2012–2016*
School of Mechanical Engineering
Advisor: Kostas J. Kyriakopoulos
Co-advisor: Minas Liarokapis
Grade: 7.76/10.00 (*top 20%*)

BSc, University of West Attica *2005–2010*
Department of Mechanical Engineering

RESEARCH EXPERIENCE

Graduate Research Assistant *Aug 2018–present*
Center for Marine Autonomy & Robotics
Virginia Tech

Graduate Research Assistant *May 2017–Aug 2018*
Computational Multiphysics Systems Laboratory
Virginia Tech

Member & Research Associate *Sep 2014–present*
The OpenBionics Initiative

Research Assistant *Apr 2014–Mar 2016*
Control Systems Laboratory
National Technical University of Athens

TEACHING EXPERIENCE

Graduate Teaching Assistant *Aug 2016–May 2017*
Department of Mechanical Engineering, Virginia Tech

- 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

$3\times$ Student Travel Award (ACC)	*2019–2021*
$2\times$ Virginia Tech GSA Travel Fund Award (Humanoids, ICORR)	*2019–2020*
NSF Student Travel Grant (WuWNet)	*2019*
NTUA Thomaideion Award	*2016*
Hackaday Prize, 2^{nd} place (among 900 projects)	*2015*
Robotdalen Innovation Award, 1^{st} place	*2015*
IEEE/RAS Student Travel Award (IROS)	*2015*

INDUSTRY EXPERIENCE

Senior Mechanical Engineer *Mar 2016–Jun 2016*
Heliix Inc., Athens, Greece

· Worked on the product design and development of a waste heat recovery device.

Site Supervisor *Sep 2013–Aug 2015*
Sychem S.A., Athens, Greece

· Provided guidance to industrial maintenance crew of 6 people for a desalination plant.

Mechanical Engineer *Oct 2010–Sep 2013*
Sychem S.A., Athens, Greece

· Monitored and commissioned desalination plants.

Aircraft Maintenance Engineer Trainee *May 2008–Jan 2010*
Olympic Aviation, Athens, Greece

· Performed engineering work of maintenance and modifications on aircrafts.

PUBLICATIONS

Referred Journal Publications

[J1] Zirui Xu, **George P. Kontoudis**, Kyriakos G. Vamvoudakis, "Online and Robust Intermittent Motion Planning in Dynamic and Changing Environments." *(resubmitted)*

[J2] Geng Gao, Mojtaba Shahmohammadi, Lucas Gerez, **George P. Kontoudis**, Minas Liarokapis, "On Differential Mechanisms for Underactuated, Lightweight, Adaptive Prosthetic Hands," *Frontiers in Neurorobotics*, 2021.

[J3] **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.

[J4] **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.

[J5] **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. *(to appear)*

Referred Conference Publications

[C1] Josh Netter, **George P. Kontoudis**, Kyriakos G. Vamvoudakis, "Bounded Rational RRT-QX: Multi-Agent Motion Planning in Dynamic Human-Like Environments Using Cognitive Hierarchy and Q-Learning," *IEEE Conference on Decision and Control (**CDC**)*, Austin, USA, 2021. *(accepted)*

[C2] **George P. Kontoudis**, Daniel J. Stilwell, "Decentralized Nested Gaussian Processes for Multi-Robot Systems," *IEEE International Conference on Robotics and Automation (**ICRA**)*, Xi'an, China, 2021.

[C3] Minas Liarokapis, **George P. Kontoudis**, "Teaching Robotic and Biomechatronic Concepts with a Gripper Design Project and a Grasping and Manipulation Competition," *IEEE International Conference on Robotics and Automation (**ICRA**)*, Xi'an, China, 2021.

[C4] **George P. Kontoudis**, Daniel J. Stilwell, "Prediction of Acoustic Communication Performance in Marine Robots Using Model-Based Kriging," *American Control Conference (**ACC**)*, New Orleans, USA, 2021.

[C5] 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.

[C6] **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.

[C7] **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.

[C8] **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.

[C9] **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.

[C10] **George P. Kontoudis**, Kyriakos G. Vamvoudakis, "Robust Kinodynamic Motion Planning using Model-Free Game-Theoretic Learning," *American Control Conference (**ACC**)*, Philadelphia, USA, 2019.

[C11] 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.

[C12] **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) *2019–2021*

· 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*
- Journal of Optimization Theory and Applications (JOTA) *2021*
- 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

- "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

PhD Students

- Joshua Netter, Georgia Institute of Technology *2020–present*
  Advisor: Kyriakos G. Vamvoudakis

Master's Students

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

SKILLS

Languages	English, Greek (native)
Operating Systems	Windows, Linux, ROS
Design & Simulation Software	Solidworks, AutoCAD, ANSYS
Programming	MATLAB, R, Python, Julia, C/C++, HTML/CSS, LaTeX
Other Skills	3D printing, Laser cutting

MEMBERSHIPS & SOCIETIES

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)

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

RECOMMENDATIONS

1. **Daniel J. Stilwell** - Professor, Department of Electrical and Computer Engineering, Virginia Tech, USA
   ✉ stilwell@vt.edu https://www.marinerobotics.centers.vt.edu/people/stilwell.html
2. **Kyriakos G. Vamvoudakis** - Assistant Professor, School of Aerospace Engineering, Georgia Tech, USA
   ✉ kyriakos@gatech.edu kyriakos.ae.gatech.edu
3. **Minas Liarokapis** - Senior Lecturer, Department of Mechanical Engineering, University of Auckland, New Zealand
   ✉ m.liarokapis@auckland.ac.nz minasliarokapis.com