Nare Karapetyan

Curriculum Vitae

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Research Interests: Area Coverage, Marine Robotics, Multi-robot Systems, Path Planning, Exploration

EDUCATION

2016 - 2021	**PhD in Computer Science**, University of South Carolina *Dissertation: "Robot Area Coverage Path Planning in Aquatic Environments"*
2013 - 2015	**MSc in Computer and Information Science**, American University of Armenia (AUA) *Thesis: "Area Coverage for Multi-robot Systems"*
2008 - 2012	**BSc in Applied Mathematics and Informatics**, Yerevan State University (YSU) *Thesis: "Global Value Numbering Optimization for WebKit Jit compiler"*
02 - 05/2012	Visiting Undergraduate Student, Lomonosov Moscow State University, Moscow, Russia

EXPERIENCE

01/2022 - current	Postdoctoral Associate, **University of Maryland**, MD, USA
08/2016 - 12/2021	Research and Teaching Assistant, **University of South Carolina, Columbia**, SC, USA
02/2020 - 07/2020	Software Engineering Intern, **iRobot**, Pasadena, CA, USA
02/2015 -08/2016	Research and Teaching Associate, **American University of Armenia**, Yerevan, Armenia
05/2013 - 07/2014	Software Engineer, **Improvis LLC**, Yerevan, Armenia
09/2011 - 11/2012	Software Developer, **Ivannikov Institute of Russian Academy of Sciences (ISP RAS)**
01/2010 - 06/2011	Software Engineering Trainee, **Instigate LLC**, Yerevan, Armenia

AWARDS

2021, Dec	2022 Breakthrough Graduate Scholars award
2021-2022	Maryland Robotics Center Postdoctoral Fellowship
2020-2021	JSPS Postdoctoral Fellowship for Research in Japan, Short Term Program (covid affected)
2019, Oct	Third Prize in OCEANS'19 Seattle Student Poster Competition
2017 - 2019	Armenian General Benevolent Union (AGBU), US Graduate Scholarship
2016 - 2019	Graduate Assistantship, University of South Carolina
2019, Nov	IROS Student and Developing Countries (SDC) Travel Award
2018, 2019	University of South Carolina Graduate School Travel Grant
2018, May	ICRA RAS Travel Award funded by the US NSF
2017, Oct	IROS Travel Award for Doctoral Consortium funded by the US NSF
07/2015	Calouste Gulbenkian Foundation, Short Term Conference Travel Grant
2013 – 2015	AUA/MoES full tuition fee scholarship, American University Of Armenia (AUA)
2014	Annual Presidential IT Award as Best Master Student in the IT sector, Armenia
09/2011 – 05/2012	Undergraduate Research Scholarship, ISP RAS
08/2011 – 12/2011	Nominal Award for building the "Mobot" mine detecting robot, ArmRobotics Competition
2009 – 2012	MoES full tuition fee scholarship, Yerevan State University

Grants

[G4] Army Research Lab (ARL) ArtIAMAS Year 3: Developing Novel Risk Sensitive Maneuver Tradeoffs for a Team of Ground Vehicles; Dinesh Manocha, Pratap Tokekar, Amrit Singh Bedi, **Nare Karapetyan**, Brian M Sadler ($125k, 03/2023 - 03/2024)

[G3] ARL ArtIAMAS Year 3 MIPS: Autonomous Planning and Navigation for Multi-Robot Ground and Aerial Collaborative Coordination and Decision Making; Pratap Tokekar, **Nare Karapetyan**, James Dotterweich ($150k, 03/2023-03/2024)

[G2] ARL MIPS-Pilot: Autonomous Planning and Navigation for Multi-Robot Ground and Aerial Collaborative Coordination and Decision Making; Pratap Tokekar, **Nare Karapetyan**, Johny Cruppi, James Dotterweich ($60k, 09-12/2022)

[G1] SPARC Graduate Research Grant, University of South Carolina: **Nare Karapetyan** ($5k, 06-08/2019)

PUBLICATIONS

Journal Papers

[J2] Jing Liang, Kasun Weerakoon, Tianrui Guan, **Nare Karapetyan** and Dinesh Manocha, AdaptiveON: Adaptive Outdoor Navigation Method For Stable and Reliable Motions; Robotics and Automation Letters (RA-L), 2022

[J1] **Nare Karapetyan**, James Johnson, and Ioannis Rekleitis, Human Diver Inspired Visual Navigation for Coverage Path Planning of Shipwrecks, *Marine Technology Society Journal,* "Best of OCEANS 2020" July/August issue 2021

Fully-Refereed Conference Papers

[C15] Ahmad Asghar, Guangyao Shi, **Nare Karapetyan**, Jean-Paul Reddinger, James Dotterweich, James Humann, and Pratap Tokekar; Risk-aware Recharging Rendezvous for a Collaborative Team of UAVs and UGVs; *In IEEE International Conference on Robotics and Automation (ICRA)*, 2023 (under review).

[C14] Xiaomin Lin, Nitin J. Sanket, **Nare Karapetyan**, Yiannis Aloimonos; Oyster Simulation Augmented Oyster Segmentation, *In IEEE International Conference on Robotics and Automation (ICRA)*, 2023 (under review).

[C13] Kasun Weerakoon, Souradip Chakraborty, **Nare Karapetyan,** Amrit Singh Bedi and Dinesh Manocha; HTRON: Efficient Outdoor Navigation with Sparse Rewards via Heavy Tailed Adaptive Reinforce Algorithm, *Conference of Robot Learning (CoRL)*, Auckland, NZ, 2022

[C12] Guangyao Shi, **Nare Karapetyan**, Ahmad Bilal Asghar, Jean-Paul Reddinger, James Dotterweich, James Humann, Pratap Tokekar; Risk-aware UAV-UGV Rendezvous with Chance-Constrained Markov Decision Process, *Conference on Decision and Control (CDC)*, Cancún, Mexico, 2022

[C11] Ibrahim Salman*, Jason Raiti*, **Nare Karapetyan***, Annie Bourbonnais, Jason M. O'Kane, and Ioannis Rekleitis; Confined Water Body Coverage under Resource Constraints, *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, Kyoto, Japan, 2022 [*equal contributors]

[C10] Marios Xanthidis, Michail Kalaitzakis, **Nare Karapetyan**, Alex Johnson, Nikolaos Vitzilaios, Jason M. O'Kane, and Ioannis Rekleitis; AquaVis: A Perception-Aware Autonomous Navigation Framework for Underwater Vehicles, *International Conference on Intelligent Robots and Systems* (*IROS)*, Prague, Czech Republic, 2021

[C9] Marios Xanthidis, **Nare Karapetyan**, Hunter Damron, Sharmin Rahman, James Johnson, Allison O'Connell, Jason M. O'Kane, and Ioannis Rekleitis; Navigation in the Presence of Obstacles for an Agile Autonomous Underwater Vehicle, *In IEEE International Conference on Robotics and Automation (ICRA)*, Paris, France, 2020

[C8] **Nare Karapetyan**, Adam Braude, Jason Moulton, Joshua A. Burstein, Scott White, Jason M. O'Kane, and Ioannis Rekleitis, Riverine Coverage with an Autonomous Surface Vehicle over Known Environments, *In IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, Macau, China, 2019

[C7] Bharat Joshi, Sharmin Rahman, Michail Kalaitzakis, Brennan Cain, James Johnson, Marios Xanthidis, **Nare Karapetyan**, Alan Hernandez, Alberto Quattrini Li, Nikolaos Vitzilaios, Ioannis Rekleitis, Experimental Comparison of Open Source Visual-Inertial-Based State Estimation Algorithms in the Underwater Domain, *In IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, Macau, China, 2019

[C6] **Nare Karapetyan**, Jason Moulton and Ioannis Rekleitis, Meander Based River Coverage by an Autonomous Surface Vehicle, *Field and Service Robotics: Recent Advances in Research and Applications (FSR)*. Springer, Tokyo, Japan, 2019

[C5] Jason Moulton, **Nare Karapetyan**, Michail Kalaitzakis, Alberto Quattrini Li, Nikolaos Vitzilaios, Ioannis Rekleitis, Effects Modeling – Dynamic Autonomous Surface Vehicle Controls Under Changing Environmental Forces, Field and Service Robotics: Recent Advances in Research and Applications (FSR). Springer, Tokyo, Japan, 2019

[C4] **Nare Karapetyan**, Jason Moulton, Jeremy Lewis, Alberto Quattrini Li, Jason O'Kane, Ioannis Rekleitis, Multi-robot Dubins Coverage with Autonomous Surface Vehicles, *In IEEE International Conference on Robotics and Automation (ICRA)*, Brisbane, Australia, 2018

[C3] Jason Moulton, **Nare Karapetyan**, Alberto Quattrini Li, Ioannis Rekleitis, External Force Field Modeling for Autonomous Surface Vehicles, *In International Symposium of Experimental Robotics (ISER)*, Buenos Aires, Argentina, 2018

[C2] **Nare Karapetyan,** Kelly Benson, Chris McKinney, Perouz Taslakian, Ioannis Rekleitis, Efficient Multi-Robot Coverage of a Known Environment, *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, Vancouver, Canada, 2017

[C1] Nelson Baloian, Wolfram Luther, Daniel Biella, **Nare Karapetyan**, Jose A. Pino, Tobias Schreck, Nancy Hitschfeld, Exploring Collaboration in the Realm of Virtual Museums, *23rd International Conference on Collaboration and Technology (CRIWG),* Saskatoon, Canada, 2017

Lightly-Refereed Conference and Workshop Papers

[E8] Xiaomin Lin, Nitesh Jha, Mayank Joshi, **Nare Karapetyan**, Yiannis Aloimonos and Miao Yu; Underwater Simulation for Enhancing Oyster Reef Monitoring, *In MTS/IEEE OCEANS*, Hampton Roads, 2022.

[E7] Ibrahim Salman, **Nare Karapetyan**, Archana Venkatachari, Alberto Quattrini Li, Annie Bourbonnais, Ioannis Rekleitis; Multi-Modal Lake Sampling for Detecting Harmful Algal Blooms, *In MTS/IEEE OCEANS*, Hampton Roads, 2022.

[E6] Marios Xanthidis, Bharat Joshi, **Nare Karapetyan**, Monika Roznere, Weihan Wang, James Johnson, Alberto Quattrini, Jesse Casana, Philippos Mordohai, Srihari Nelakuditi, Ioannis Rekleitis, Towards Multi-Robot Shipwreck Mapping, 1st Advanced Marine Robotics TC Workshop:Active Perception, *In IEEE International Conference on Robotics and Automation (ICRA)*, Xi'an, China (virtual), 2021.

[E5] **Nare Karapetyan**, James Johnson, and Ioannis Rekleitis, Coverage Path Planning for Mapping of Underwater Structures with an Autonomous Underwater Vehicle, *In MTS/IEEE OCEANS Singapore*, 2020 (accepted to Student Poster Competition)

[E4] **Nare Karapetyan**, Ioannis Rekleitis. Coverage of Rivers with Autonomous Surface Vehicles. Informed Scientific Sampling in Large-scale Outdoor Environments Workshop, *In IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, Macau, China, 2019.

[E3] **Nare Karapetyan**, Jason Moulton, and Ioannis Rekleitis, Dynamic Autonomous Surface Vehicle Control and Applications in Environmental Monitoring, *In MTS/IEEE OCEANS Seattle*, WA, USA, 2019 (winner of 3rd prize at the Student Poster Competition)

[E2] Sharmin Rahman, **Nare Karapetyan**, Alberto Quattrini Li, and Ioannis Rekleitis, A Modular Sensor Suite for Underwater Reconstruction, *In MTS/IEEE OCEANS Charleston*, SC, USA, 2018

[E1] Jason Moulton, **Nare Karapetyan**, Sharon Bukhsbaum, Chris McKinney, Sharaf Malebary, George Sophocleous, Alberto Quattrini Li, and Ioannis Rekleitis, An Autonomous Surface Vehicle for Long Term Operations, *In MTS/IEEE OCEANS Charleston*, SC, USA, 2018

SKILLS

Programming:	C/C++, Python, Java, bash scripting, octave
Libraries:	STL, QT, OpenCV, Boost (GBL), scikit-learn, Keras, pandas
Tools, Technologies:	Robotics Operating System (ROS), GNU C++ compiler/debugger GCC and GDB, Docker, gtest, vim, SVN, git, LaTeX, QT creator, StarUML, Arduino, Raspberry Pi, Pixhawk
Languages:	Armenian (native), Russian (fluent), English (professional)

CONFERENCES and TALKS

Dec 14, 2022	Invited talk at GRASPLab, University of Pennsylvania, PA, USA
Oct 5-15, 2020	OCEANS'20 conference, Singapore, Singapore, (Virtual)
Nov 4 -8, 2019	IROS 2019 conference, Macao, Macau, China
Oct 27 - 31, 2019	OCEANS'19 conference, Seattle, WA, USA
Sept 26 - 27, 2019	1st Annual Computing@SEC Meeting at the University of Alabama, AL, USA
Aug 29-31, 2019	12th Conference on Field and Service Robotics, Tokyo, Japan
March 15, 2019	Public Lecture on Marine Robotics, AUA, Yerevan, Armenia
May 21 - 26, 2018	ICRA 2018 conference, Brisbane, Australia
April 15, 2018	Discover USC: Three-minute thesis, UofSC, Columbia, SC, USA
Sept 21 - 28, 2017	IROS and ROScon 2017 conference, Vancouver, Canada

WORKSHOPS and TRAININGS

Jan 01 - 18, 2020	Bellairs 16th Annual Field Trials and Workshop, Holetown, Barbados
Oct 1 - 04, 2019	Grace Hopper Celebration, Orlando, Florida
Jan 01 - 18, 2019	Bellairs 15th Annual Field Trials and Workshop, Holetown, Barbados
Aug 13 - 16, 2018	AQUA Workshop at the University of Minnesota (UMN), Minneapolis, MN, USA
Jun 28 - Jul 5, 2017	Deep Learning and Reinforcement Learning Summer School , Montreal, Canada
Jan 01 - 14, 2017	Bellairs 13th Annual Field Trials and Workshop, Holetown, Barbados
Feb 22 - 25, 2015	IBM Watson training , Yerevan, Armenia
Aug 23 - Sept 4, 2015	Machine Learning Summer School, Kyoto, Japan

TEACHING EXPERIENCE

Instructor:

Summer 2019	Robotics, Upward Bound Program, Eau Claire High School
Fall 2018	CSCE 274 Robotic Applications and Design, University of South Carolina
Summer 2015, Fall/Spring 2016	MATH111 Discrete Math, American University of Armenia (AUA)

Teaching Assistant:

Fall 2016, 2017, Spring 2018	CSCE 145, 146 Algorithmic Design I, II, University of South Carolina
Spring/Fall 2015, 2016	ClS311(grad), CS211 Theory of Algorithms, AUA
Spring 2016	CIS332(grad), CS132 Theory of Communication Networks, AUA

ACADEMIC SERVICES

Associate Editor:

- International Conference on Intelligent Robots and Systems IROS 2022
- Robotics Automation and Letters (RA-L) 2022

Workshop Organizer:

- Envisioning an Infrastructure for Multi-Robot and Collaborative Autonomy Testing and Evaluation: RSS2022

Reviewer:

- International Conference on Robotics and Automation, (ICRA:19-22, RAL-ICRA: 19-22)
- IEEE Transactions on Robotics Journal (T-RO: 21-22)
- Journal of Autonomous Robots, 2018 (AURO)
- IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS: 17-22)

- Woman in Machine Learning Workshop at NIPS (WiML17)

ORGANIZATIONS

- IEEE member (since 2017)
- Upsilon Pi Epsilon Honor Society for the Computing Sciences (since 2018)
- The Oceanography Society (since 2021)
- Armenian Society of Fellows (ASOF) (since 2022)

VOLUNTEERING

Feb 2017 - 2019	701 Center for Contemporary Art - volunteering as an assistant for artists and the gallery
July14-17, 2019	Conference on Data and Applications Security (DBSec'19), Charleston, SC, USA
Sept 22 - 25, 2015	CRIWG 2015 conference , Yerevan, Armenia

NON-ACADEMIC

Sustainability - Scuba diving - Hiking - Photography - Contemporary Art

REFERENCES

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