Gennaro Notomista

Personal Information

ADDRESS
IRISA, Inria Rennes-Bretagne Atlantique
Campus de Beaulieu
35042 Rennes-cedex
France

CONTACTS
+33 2 99 84 71 00
gennaro.notomista@irisa.fr
gnotomista
www.gnotomista.com

Education

AUG 2016 – AUG 2020
Ph.D. in Robotics
Georgia Institute of Technology, Atlanta, GA, USA

MAY 2019 – DEC 2019
M.S. in Mathematics
Georgia Institute of Technology, Atlanta, GA, USA

MAR 2015 – JAN 2016
M.S. in Mechanical Engineering
Università degli Studi di Napoli "Federico II", Napoli, Italy
THESIS SUPERVISOR: Dr. Bruno Siciliano
THESIS TITLE: Validation of Model-Based Criticality Estimates in Vehicle Safety Using a Multi Camera Reference System

OCT 2013 – MAR 2015
M.Eng. in Automotive Engineering
Technische Hochschule Ingolstadt, Ingolstadt, Germany
THESIS SUPERVISOR: Dr. Michael Botsch
THESIS TITLE: Parking Maneuver Planning Based on Machine Learning

OCT 2009 – SEP 2012
B.S. in Mechanical Engineering
Università degli Studi di Napoli "Federico II", Napoli, Italy
THESIS SUPERVISOR: Dr. Luciano Rosati
THESIS TITLE: Polar Decomposition of the Deformation Gradient

Research Interests

- Energy-aware robotics for long-duration autonomy
- Safe robot learning and control
- Control-theoretic human-robot interaction
- Mechanical design of robotic platforms

Research and Professional Experiences

NOV 2020 – PRESENT

Researcher
CNRS, Rennes, France
- Human-multi robot interaction

JAN 2017 – AUG 2020

Member of the Robotarium Team
Georgia Institute of Technology, Atlanta, GA, USA
- Mechanical design of components of differential drive robots
- Mechanical design of components of the Robotarium testbed
- Design and implementation of visual tracking algorithms

JUL 2019 – AUG 2019

Visiting Scholar
Stanford University, Stanford, CA, USA
- Autonomous car racing
- Robust safety
- Adaptive reinforcement learning

JAN 2016 – JUN 2016

Internship Position
Istituto Italiano di Tecnologia, Genova, Italy
- Stereo vision for objects pose estimation
- Grasping and mobile manipulation
- Vision-aided teleoperated control of robot manipulators

JUL 2015 – DEC 2015

Research Assistant Position
Technische Hochschule Ingolstadt, Ingolstadt, Germany
- Cooperative driving
- Stereo vision tracking algorithms and applications
- Embedded systems design

JUL 2015 – DEC 2015

Internship Position
Audi AG, Ingolstadt, Germany
- Automotive active safety
- Criticality estimation
- Stereo vision system design

DEC 2014 – MAR 2015

Software Developer
BFFT, Ingolstadt, Germany
- Vehicle simulation software development
- CAN databases for automotive applications

Skills

PROGRAMMING SKILLS

- **Applications**: C/C++, Python, Java
- **Simulation**: Matlab/Simulink
- **Robotics**: ROS
- **CAD/FEA**: Solidworks, Creo Elements/Pro, Catia, Ansys
- **Software version control**: Git
- **Scientific writing**: LaTeX
- **OS**: Linux, Windows

LANGUAGES	Italian: native proficiency English: full working proficiency German: limited working proficiency

Grants, Scholarships, Awards, and Certificates

GRANTS	Alumni Small Grant Program 2020 "What can robots teach us about the Covid-19 pandemic" *2020 - 2021*
SCHOLARSHIPS	Fulbright scholarship to pursue doctoral studies in USA *September 2016 - June 2017* DAAD scholarship B1 to conduct research in Germany *July 2015 - December 2015* DAAD scholarship A1 to pursue graduate studies in Germany *October 2013 - March 2015*
AWARDS	Best Paper Award Finalist at International Symposium on Multi-Robot and Multi-Agent Systems *New Brunswick, NJ, USA, August 2019* Study award "Roberto Rocca Educational Program" *Napoli, Italy, July 2015* Study award "Roberto Rocca Educational Program" *Napoli, Italy, July 2013* 3rd place in the national Mathematics competition "MeravigliosaMenteMatematica" *Capua, Italy, April 2009* Rotary International "Premiazioni alunni meritevoli" *Castellammare di Stabia, Italy, November 2008*
CERTIFICATES	Deutschkurs Teilnahmezertifikat, Stufe B1.2 *Volkshochschule Ingolstadt, Ingolstadt, Germany, February 2015* PRO/Engineering CAD Operator *Protom Group S.p.A, Napoli, Italy, April 2012* Solfège exam certificate *Conservatorio Musicale di Salerno "Giuseppe Martucci", Salerno, Italy, June 2005*

Publications

Journal Articles

A15. G. Notomista, S. Mayya, Y. Emam, C. Kroninger, A. Bohannon, S. Hutchinson and M. Egerstedt, "A Resilient and Energy-Aware Task Allocation Framework for Heterogeneous Multi-Robot Systems", *IEEE Transactions on Robotics (submitted)*

A14. Y. Emam, P. Glotfelter, S. Wilson, G. Notomista, and M. Egerstedt, "Data-Driven Robust Barrier

Functions for Safe, Long-Term Operation", *IEEE Transactions on Robotics (submitted)*

A13. S. Wilson, P. Glotfelter, S. Mayya, G. Notomista, Y. Emam, X. Cai, and M. Egerstedt, "The Robotarium: Automation of a Remotely Accessible, Multi-Robot Testbed", *IEEE Robotics and Automation Letters (to appear)*

A12. M. Ohnishi, G. Notomista, M. Sugiyama, and M. Egerstedt, "Constraint learning for control tasks with limited duration barrier functions", *Automatica, Vol. 127, 2021*

A11. G. Notomista and M. Egerstedt, "Persistification of robotic tasks", *IEEE Transactions on Control Systems Technology, vol. 29, no. 2, pp. 756-767, 2021*

A10. M. Santos, G. Notomista, S. Mayya, and M. Egerstedt, "Interactive Multi-Robot Painting Through Colored Motion Trails", *Frontiers in Robotics and AI, 7, 143, 2020*

A9. A. Ames, G. Notomista, Y. Wardi, and M. Egerstedt, "Integral Control Barrier Functions for Dynamically Defined Control Laws", *IEEE Control Systems Letters, Vol. 5, No. 3, pp. 887-892, 2020*

A8. R. Funada, X. Cai, G. Notomista, M. W. Surya Atman, J. Yamauchi, M. Fujita, and M. Egerstedt, "Coordination of robot teams over long distances. From Georgia Tech to Tokyo Tech and back: An 11,000 km multi-robot experiment", *IEEE Control Systems Magazine, Vol. 40, No. 4, pp. 53-79, 2020*

A7. S. Wilson, P. Glotfelter, L. Wang, S. Mayya, G. Notomista, M. Mote, and M. Egerstedt, "The Robotarium: Globally impactful opportunities, challenges, and lessons learned in remote-access, distributed control of multi-robot systems", *IEEE Control Systems Magazine, Vol. 40, No. 1, pp. 26-44, 2020*

A6. M. Ohnishi, L. Wang, G. Notomista, and M. Egerstedt, "Safety-aware adaptive reinforcement learning with applications to brushbot navigation", *IEEE Transactions on Robotics, Vol. 35, No. 5, pp. 1186-1205, 2019*

A5. G. Notomista, Y. Emam, and M. Egerstedt, "The SlothBot: A novel design for a wire-traversing robot", *IEEE Robotics and Automation Letters, Vol. 4, No. 2, pp. 1993-1998, 2019*

A4. M. Egerstedt, J. Pauli, G. Notomista, and S. Hutchinson, "Robot ecology: Constraint-based control design for long duration autonomy", *Annual Reviews in Control, Vol. 46, pp. 1-7, 2018*

A3. G. Notomista, S. Ruf, and M. Egerstedt, "Persistification of robotic tasks using control barrier functions", *IEEE Robotics and Automation Letters, Vol. 3, No. 2, pp. 758-763, 2018*

A2. G. Notomista and M. Botsch, "A machine learning approach for the segmentation of driving maneuvers and its application in autonomous parking", *Journal of Artificial Intelligence and Soft Computing Research, Vol. 7, No. 4, pp. 243-255, 2017*

A1. G. Notomista, M. Selvaggio, F. Sbrizzi, G. Di Maio, S. Grazioso, and M. Botsch, "A fast airplane boarding strategy using online seat assignment based on passenger classification", *Journal of Air Transport Management, Vol. 53, pp. 140-149, 2016*

Book Chapters

B1. G. Notomista and X. Cai, "A Safety and Passivity Filter for Robot Teleoperation Systems", *In M. Saveriano, E. Renaudo, A. Rodríguez-Sánchez, and J. Piater (editors), Human-Friendly Robotics 2020, Cham, 2021. Springer International Publishing*

Conference Proceedings

C22. Y. Emam, G. Notomista, P. Glotfelter, and M. Egerstedt, "Data-Driven Adaptive Task Allocation for Heterogeneous Multi-Robot Teams Using Robust Control Barrier Functions", *IEEE International Conference on Robotics and Automation, 2021*

C21. G. Notomista and M. Egerstedt, "Communication constrained distributed spatial field estimation using mobile sensor networks", *IFAC World Congress, 2020*

C20. G. Notomista, M. Wang, M. Schwager, and M. Egerstedt, "Enhancing game-theoretic autonomous car racing using control barrier functions", *IEEE International Conference on Robotics and Automation, 2020*

C19. G. Notomista, S. Mayya, M. Selvaggio, M. Santos, and C. Secchi, "A set-theoretic approach to multi-task execution and prioritization", *IEEE International Conference on Robotics and Automation, 2020*

C18. Y. Emam, S. Mayya, G. Notomista, A. Bohannon, and M. Egerstedt, "Adaptive task allocation for heterogeneous multi-robot teams with evolving and unknown robot capabilities", *IEEE International Conference on Robotics and Automation, 2020*

C17. G. Notomista, S. Mayya, A. Mazumdar, S. Hutchinson, and M. Egerstedt, "A study of a class of vibration-driven robots: Modeling, analysis, control and design of the brushbot", *IEEE/RSJ International Conference on Intelligent Robots and Systems, 2019*

C16. S. Mayya, G. Notomista, D. Shell, S. Hutchinson, and M. Egerstedt, "Non-uniform robot densities in vibration driven swarms using phase separation theory", *IEEE/RSJ International Conference on Intelligent Robots and Systems, 2019*

C15. G. Notomista, X. Cai, J. Yamauchi, and M. Egerstedt, "Passivity-based decentralized control of multi-robot systems with delays using control barrier functions", *IEEE International Symposium on Multi-Robot and Multi-Agent Systems, 2019*

C14. M. Santos, S. Mayya, G. Notomista, and M. Egerstedt, "Decentralized minimum-energy coverage control for time-varying density functions", *IEEE International Symposium on Multi-Robot and Multi-Agent Systems, 2019*

C13. G. Notomista, S. Mayya, S. Hutchinson, and M. Egerstedt, "An optimal task allocation strategy for heterogeneous multi-robot systems", *European Control Conference, 2019*

C12. A. Ames, S. Coogan, M. Egerstedt, G. Notomista, K. Sreenath, and P. Tabuada, "Control barrier functions: Theory and applications", *European Control Conference, 2019*

C11. G. Notomista and M. Egerstedt, "Constraint-driven coordinated control of multi-robot systems", *American Control Conference, 2019*

C10. G. Notomista, M. Santos, S. Hutchinson, and M. Egerstedt, "Sensor coverage control using robots constrained to a curve", *IEEE International Conference on Robotics and Automation, 2019*

C9. S. Mayya, G. Notomista, and M. Egerstedt, "Optimal task allocation in heterogeneous multi-robot systems using a mixed centralized/decentralized strategy", *Workshop "Resilient Robot Teams: Composing, Acting, and Learning" at IEEE International Conference on Robotics and Automation, 2019*

C8. G. Notomista and M. Egerstedt, "Coverage control for wire-traversing robots", *IEEE International Conference on Robotics and Automation, 2018*

C7. M. Selvaggio and G. Notomista, "Towards natural human-swarm teleoperation using hand synergies", *Workshop "Swarms: From Biology to Robotics and Back" at IEEE International Conference on Robotics and Automation, 2018*

C6. M. Selvaggio, S. Grazioso, G. Notomista, and F. Chen, "Towards a self-collision aware teleoperation framework for compound robots", *IEEE World Haptics Conference, 2017*

C5. F. Sbrizzi, S. Grazioso, M. Selvaggio, G. Di Maio, and G. Notomista, "Enhancing airplane boarding procedure using vision based passenger classification", *IEEE International Conference on Intelligent Transportation Systems, 2016*

C4. M. Selvaggio, G. Notomista, F. Chen, B. Gao, F. Trapani, and D. Caldwell, "Enhancing bilateral teleoperation using camera-based online virtual fixtures generation", *IEEE/RSJ International Conference on Intelligent Robots and Systems, 2016*

C3. M. Selvaggio, F. Chen, B. Gao, G. Notomista, F. Trapani, and D. Caldwell, "Vision based virtual fixture generation for teleoperated robotic manipulation", *IEEE International Conference on Advanced Robotics and Mechatronics, 2016*

C2. G. Notomista, A. Kammenhuber, P. Nadarajan, M. Botsch, and M. Selvaggio, "Relative motion estimation based on sensor eigenfusion using a stereoscopic vision system and adaptive statistical filtering", *VDE International Symposium on Robotics, 2016*

C1. G. Notomista and M. Botsch, "Maneuver segmentation for autonomous parking based on ensemble learning", *IEEE International Joint Conference on Neural Networks, 2015*

Patents

- The SlothBot: A Novel Design for a Wire-Traversing Robot
- The Brushbot: A Robust and Versatile Swarm Robotics Platform (provisional)

References

- Dr. Magnus Egerstedt, Georgia Institute of Technology, `http://www.ece.gatech.edu/~magnus`
- Dr. Seth Hutchinson, Georgia Institute of Technology, `https://www.cc.gatech.edu/~seth`
- Dr. Mac Schwager, Stanford University, `http://www.stanford.edu/people/schwager`
- Dr. Wayne Book, Georgia Institute of Technology, `https://www.me.gatech.edu/faculty/book`
- Dr. Samuel Coogan, Georgia Institute of Technology, `http://coogan.ece.gatech.edu/`
- Dr. Michael Botsch, Technische Hochschule Ingolstadt, `https://www.thi.de/carissma/personen/prof-dr-ing-michael-botsch`

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