MATTEO IOVINO

Robotics & AI Research Scientist

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EXPERIENCE

Scientist
ABB Corporate Research Center
Jun 2023 – Present | Västerås, Sweden
- Enhancing collaborative robots with AI-ready skills

Industrial Ph.D.
ABB Corporate Research Center
Feb 2019 – Jun 2023 | Västerås, Sweden
- Automatic and intuitive generation of task level controllers for collaborative robotic applications

Engineering Internship
ABB Corporate Research Center
Apr 2018 – Sep 2018 | Västerås, Sweden
- Set up of a simulation environment with ROS and Gazebo for a mobile manipulation task

Engineering Internship
Safran Nacelles
Mar 2017 – Aug 2017 | Le Havre, France
- Set up of a simulation environment in AMESim for a thrust reverser test bench

EDUCATION

Ph.D. in Computer Science
KTH - Royal Institute of Technology
Mar 2019 – Jun 2023 | Stockholm, Sweden
- Thesis title: *Learning Behavior Trees for Collaborative Robotics* - Supervisor: Prof. Christian Smith
- Collaboration with *ABB Corporate Research*

Research Visit
ETH Zürich
Apr 2022 – Sep 2022 | Zürich, Switzerland
- Study period at the Autonomous Research Lab (ASL) led by Prof. Roland Siegwart

M.Sc. in Engineering
École Centrale de Nantes
2016 – 2018 | Nantes, France
- GPA: 3.82

SKILLS

Programming
- **Python**
- **Matlab**
- **C++**
- **C#**
- **ABB Rapid**
- **LaTeX**

Operating Systems
- **Linux**
- **MacOS**
- **Windows**

Software & Tools
- **Git**
- **ROS**
- **ROS 2**
- **Simulink**
- **ABB RobotStudio**
- **Simulators** (Gazebo, AGXDynamics)
- **Visualisation** (e.g. matplotlib, seaborn, ...)
- **Data handling/analysis** (e.g. numpy, scipy, pandas, ...)

LANGUAGES

- **English**
- **Swedish**
- **Italian**
- **Spanish**
- **French**
- **German**

PROJECTS

WASP-CBSS-BT
Setup of a tutorial about Behavior Trees in Robotics for the WASP Summer School

WASP - Manipulation and Mobility
Vision-based manipulation and mobility based on Behavior Trees and Linear Temporal Logic planning

Dual Arm Manipulation
Cooperative object carrying between a mobile manipulator and a human operator

M.Sc. in Control Engineering

Università degli Studi di Padova

2015 – 2018 Padova, Italy

- Final grade: 110/110 with honors

B.Sc. in Information Engineering

Università degli Studi di Padova

2012 – 2015 Padova, Italy

- Final grade: 103/110

PUBLICATIONS

Journal Articles

- M. Iovino, E. Scukins, J. Styrud, P. Ögren, and C. Smith, "A survey of Behavior Trees in robotics and AI," *Robotics and Autonomous Systems*, vol. 154, p. 104 096, Aug. 2022, ISSN: 0921-8890. DOI: 10.1016/j.robot.2022.104096.

Conference Proceedings

- M. Iovino, J. Förster, P. Falco, J. J. Chung, R. Siegwart, and C. Smith, "On the programming effort required to generate Behavior Trees and Finite State Machines for robotic applications," in *2023 IEEE International Conference on Robotics and Automation (ICRA)*, May 2023.
- M. Iovino, J. Styrud, P. Falco, and C. Smith, "A Framework for Learning Behavior Trees in Collaborative Robotic Applications," arXiv:2303.11026, arXiv, Mar. 2023. DOI: 10.48550/arXiv.2303.11026. arXiv: arXiv:2303.11026.
- O. Gustavsson, M. Iovino, J. Styrud, and C. Smith, "Combining Context Awareness and Planning to Learn Behavior Trees from Demonstration," in *2022 31st IEEE International Conference on Robot and Human Interactive Communication (RO-MAN)*, ©2022 IEEE. Reprinted, with permission., Aug. 2022, pp. 1153–1160. DOI: 10.1109/RO-MAN53752.2022.9900603.
- M. Iovino, F. I. Doğan, I. Leite, and C. Smith, "Interactive Disambiguation for Behavior Tree Execution," in *2022 IEEE-RAS 21st International Conference on Humanoid Robots (Humanoids)*, ©2022 IEEE. Reprinted, with permission., Nov. 2022, pp. 82–89. DOI: 10.1109/Humanoids53995.2022.10000088.
- M. Iovino and C. Smith, "Behavior Trees for Robust Task Level Control in Robotic Applications," arXiv:2301.06434, arXiv, 2022. DOI: 10.48550/arXiv.2301.06434. arXiv: 2301.06434 [cs].
- J. Styrud, M. Iovino, M. Norrlöf, M. Björkman, and C. Smith, "Combining Planning and Learning of Behavior Trees for Robotic Assembly," in *2022 International Conference on Robotics and Automation (ICRA)*, May 2022, pp. 11 511–11 517. DOI: 10.1109/ICRA46639.2022.9812086.
- M. Iovino, J. Styrud, P. Falco, and C. Smith, "Learning Behavior Trees with Genetic Programming in Unpredictable Environments," in *2021 IEEE International Conference on Robotics and Automation (ICRA)*, ©2021 IEEE. Reprinted, with permission., May 2021, pp. 4591–4597. DOI: 10.1109/ICRA48506.2021.9562088.