

# Javier Macias Sola

✉ jamaciastf@gmail.com | 💻 jamacias.github.io | 🌐 jamaciastf | 🐙 jamacias

## About Me

---

My passion for robotics is driven by the excitement of seeing things work optimally on their own. I am mostly interested in developing advanced perception systems and mobile robots and have extensive experience bringing early prototypes to stable series production. With broad international experience and equipped with self-initiative and T-shaped skills, I am enabled to continue being a leading voice in challenging interdisciplinary projects.

## Experience

---

- |  |  |
|--|--|
| <b>Error Management Lead</b> , Bosch Rexroth AG<br>Coordinating the activities of the different teams to design and improve the management of operational errors in robot fleets with direct report to 2nd level management.   | Stuttgart, Germany<br>Dec 2024 – present   |
| <b>Senior Robotics Software Engineer</b> , Bosch Rexroth AG<br><i>Perception and vision expert</i> : leading the planning and development of the perception capabilities of an industrial mobile robot (AMR). <ul style="list-style-type: none"> <li>Designed a line segmentation algorithm that achieved 10x more precision at 1.66x processing speed, freeing necessary resources for other features.</li> <li>Boosted the profitability of the AMR by redesigning the line control algorithm to reach 3x greater speeds in confined spaces.</li> <li>Unleashed advanced navigation capabilities by designing a 2.38x faster robust point cloud-based ground segmentation algorithm.</li> <li>Developed stereo-matching failure detector that secured the sales to customers whose infrastructure had repetitive structures.</li> <li>Prevented unnecessary servicing costs of robots in the field by coordinating and designing a novel marker pose-based extrinsic camera calibration method.</li> <li>Supervised several interns in AI-based semantic segmentation and control engineering topics.</li> </ul> | Stuttgart, Germany<br>July 2022 – present  |
| <b>Scrum Master</b> , Bosch Rexroth AG<br>Leading a team of 10 experienced robotics software engineers to increase throughput by encouraging better team collaboration and communication culture.  | Stuttgart, Germany<br>June 2021 – present  |
| <b>Junior Robotics Software Engineer</b> , Bosch Rexroth AG <ul style="list-style-type: none"> <li>Developed an obstacle detection system based on stereo-vision cameras and point-clouds necessary to secure the marketability of the robot.</li> <li>Reduced the manufacturing failure rate of monocular cameras by developing a camera lens calibration tool to assist operators.</li> </ul>  | Stuttgart, Germany<br>Mar 2021 – June 2022 |
| <b>Robotics Software Engineer Intern</b> , Bosch Rexroth AG <ul style="list-style-type: none"> <li>Developed an <u>industrial Master's Thesis</u> proposing a novel image-based localization system using ground textures, which also led to a <u>publication</u>.</li> <li>Coordinated and developed an innovation project (from prototype to final product) with other international business units. The results led to a <u>patent application</u>.</li> <li>Developed a novel line segmentation algorithm leading to 3.6x fewer false negatives while conserving real-time processing capabilities.</li> </ul>   | Stuttgart, Germany<br>Mar 2020 – Feb 2021  |

## Technologies and Domains

---

**Languages:** (Modern) C++, Python, Bash, MATLAB.

**Libraries and frameworks:** OpenCV, Point Cloud Library (PCL), ROS-like middlewares, Eigen, Magnum Graphics, ImGui, NumPy, SciPy, Pandas, PyTorch, Agile methodologies.

**Tools:** Git, CMake, Make, Linux, Docker, Ubuntu Core.

**Domains:** sensor fusion, calibration and 3D reconstruction, (AI) segmentation, feature detection, drivers, visualization, simulation.

## Other Skills and Languages

---

**Soft-skills and qualities:** Team leadership, team player, creativity, innovation, problem solver, adaptability.

**Languages:** Spanish (native), English (C2), German (B1), French (B1), Italian (B1).

## Publications and Patents

---

**A Ground Texture-based Mapping and Localization Method for AGVs** Nov 2021

*Javier Macías-Solá*, Sarah Uttendorf, Jan O. Blech

[10.1109/IPIN51156.2021.9662556](#) (2021 International Conference on Indoor Positioning and Indoor Navigation (IPIN), 2021, pp. 1-6)

**Automatically operated industrial truck with a load sensor device** June 2021

*Javier Macias Sola*, Stefan Leibold, Markus Brodt, Sarah Uttendorf

[patents.google.com/patent/DE102021206411A1](https://patents.google.com/patent/DE102021206411A1)

## Open Source Contributions

---

**OpenCV:** Enhance cv::TickMeter to be able to get the last elapsed time ([#26212](#)).

## Education

---

**MSc. Autonomous Systems**, Aalto University Helsinki, Finland

• **Master's Thesis:** '[Indoor Localization of AGVs: A Ground Texture Based Solution](#)' at Sept 2019 – Nov 2020  
Bosch Rexroth AG.

**MSc. Mechatronics Engineering**, University of Trento Trento, Italy

Note: joint programme with Aalto University. Sept 2018 – Aug 2019

**BSc. Electronics Engineering and Automation**, University of La Laguna La Laguna, Spain

• **Bachelor's Thesis:** '[Mechanical, electronic and software prototype of a low-cost autonomous rover for agriculture](#)'. **Awards:** Accesit Prize by the Engineers Association of Tenerife (COITTF). Sept 2014 – July 2018

• **Erasmus+ Programme:** Politechnika Wroclawska, Poland.

• **Extracurricular activities:** Formula Student Electronics Team Lead.