

Miguel Castellón

Webpage: miguelcastillon.github.io
Email: miguel.castillon@udg.edu
Linkedin: linkedin.com/miguel-castillon
Nationality: Spanish



Education

- (Fall 2022) | **PhD in Robotics**
01 / 2019 | University of Girona (Spain)
- 07 / 2018 | **MSc in Mechanical Engineering**
09 / 2016 | KU Leuven (Belgium)
Robotics & Mechatronics
Magna cum laude
- 07 / 2015 | **BSc in Industrial Engineering**
09 / 2011 | University of Zaragoza (Spain)

About me

- 🎓 I'm a **PhD student** at the Underwater Robotics Lab of University of Girona under the supervision of Prof. Pere Ridao.
- 📷 My main research interests include exploiting **sensor perception** for autonomous navigation and manipulation in challenging scenarios.
- 🔍 I'm currently investigating novel **non-rigid** data association methods to recover true object shape out of distorted 3D scans.

Research Experience

- (Fall 2022) | **PhD candidate at the Underwater Robotics Lab, University of Girona (Spain)**
01 / 2019 | Enabling underwater robots to use range data from laser-based sensors for mapping and manipulation tasks. To this end we built an **underwater laser scanner**, which allowed me to face challenges ranging from sensor calibration to integration in autonomous platforms.
- 04 / 2022 | **Visiting researcher at the Autonomous Systems Lab (ASL), ETH Zurich (Switzerland)**
09 / 2021 | Presented a new non-rigid point cloud registration algorithm that corrects **motion distortion** in dynamic scans, improving accuracy of localization and mapping tasks.
- 07 / 2018 | **MSc thesis at the Mechatronic System Dynamics Lab, KU Leuven (Belgium)**
10 / 2017 | Developed a **vision-based algorithm** capable of reconstructing full-field vibrations of mechanical structures based on observations of natural-frequency deformations.
- 06 / 2018 | **Research intern at The Kobi Company, Leuven (Belgium)**
11 / 2017 | Studied the performance of different **feature-based stereo matching** strategies for the autonomous navigation of the lawn mowing robot.
- 08 / 2017 | **Research intern at Octinion, Leuven (Belgium)**
06 / 2017 | Trained a **ML classifier** to assign ripeness category to berries detected by the autonomous strawberry picking robot.
- 07 / 2015 | **BSc thesis at the Vision for Robotics Lab, TU Vienna (Austria)**
01 / 2015 | Compared different feature-based strategies to match 2D floor plan **LiDAR scans** for autonomous navigation.

Journal Publications

- **M. Castellón**, P. Ridao, R. Siegwart and C. Cadena, “Linewise Non-Rigid Point Cloud Registration,” submitted to IEEE Robotics and Automation Letters in February 2022.
- **M. Castellón**, J. Forest and P. Ridao, “Underwater 3D scanner to counteract refraction: calibration and experimental results,” in IEEE/ASME Transactions on Mechatronics, doi: 10.1109/TMECH.2022.3170504.
- **M. Castellón**, R. Pi, N. Palomeras and P. Ridao, “Extrinsic Visual-Inertial Calibration for Motion Distortion Correction of Underwater 3D Scans,” in IEEE Access, vol. 9, pp. 93384-93398, 2021, doi: 10.1109/ACCESS.2021.3092180.
- **M. Castellón**, A. Palomer, J. Forest and P. Ridao, “Underwater 3D Scanner Model Using a Biaxial MEMS Mirror,” in IEEE Access, vol. 9, pp. 50231-50243, 2021, doi: 10.1109/ACCESS.2021.3069189.
- **M. Castellón**, A. Palomer, J. Forest, and P. Ridao, “State of the Art of Underwater Active Optical 3D Scanners,” Sensors, vol. 19, no. 23, p. 5161, Nov. 2019, doi: 10.3390/s19235161.

Teaching Experience

06 / 2022	Supervisor of autonomous navigation student projects (6 ECTS)
03 / 2022	Mentoring master students on their hands-on project: autonomous navigation of a Kobuki base equipped with RGBD and 2D LiDAR.
04 / 2022	Co-supervisor of two MSc theses
09 / 2021	<ul style="list-style-type: none">• Exploring Cycle GANs to add realistic noise distributions to synthetic underwater sonar images.• Dense volumetric sonar-based underwater mapping.
01 / 2021	Lab assistant for computer architecture (6 ECTS)
09 / 2020	Teaching undergraduate lab sessions on logic operators and state machines.

Software Skills

Languages	C++, Python, Matlab, CMake
Libraries	OpenCV, Ceres, PCL, GTSAM
Misc	ROS, git

Languages

Spanish	Native
English	C1 TOEFL 110/120, April 2015
German	C1 EOI Girona, June 2021
Catalan	C1 Universitat de Girona, January 2020

Extracurricular Activities

09 / 2018	Summer intern at Thái Nguyên University of Technology (Vietnam)
07 / 2018	Taught basic ML and English language by developing a facial recognition tool with educational purposes.
2014	Handball Volunteer coach at AD Corazonistas, Zaragoza (Spain)
2011	Responsible for teams of children between 10 and 14 years old