

Javier Morlana

student in Computer Vision



About me

I recently obtained my PhD at the University of Zaragoza. My research goal was focused on SLAM and Visual Place Recognition (VPR) in the specific domain of colonoscopies, with the aid of Deep Learning techniques.

I have some papers following this line of research. *SD-DefSLAM* was able to perform deformable SLAM in endoscopy sequences, including a relocalization module using Bag of Words. *Reuse your features* appeared at *ICRA 2023*, where we presented a single network able to extract all the features needed for Visual Localization. *ColonMapper* (*ICRA 2024*), an approach to build global maps for the entire colon. *ColonMapper* can recognize places between two colonoscopies of the same patient, using a global descriptor boosted by a Bayesian approach. My latest contribution is *ColonSLAM* (*MICCAI 2024*), the first topological SLAM able to build maps for the whole colon while localizing them against the map being built.

My work experience includes research internships at Google and Leica Geosystems, related to Visual-Inertial SLAM. I also worked with Computer Vision and SLAM algorithms such as ORBSLAM and DefSLAM before my PhD, using these systems to model non-rigid scenes.

I'm proficient in Python and C++ and I have experience in common CV/ML libraries such as OpenCV, Pytorch, NumPy, Eigen, Ceres or g2o.

Contact

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📞 Javier Morlana

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EDUCATION

2020-2025



PhD in Computer Vision

📍 Spain

University of Zaragoza

Supervised by professor J.M.M.Montiel

SLAM and Visual Place Recognition in colonoscopies, with the aid of neural networks.

2017-2019



Master in Industrial Engineering

📍 Spain

University of Zaragoza

Specialized in robotics.

Rank: 3/88. Thesis "Evaluation and processing of non-rigid scenes with a deformable VSLAM system".

2013-2017



Bachelor in Industrial Eng. Technology

📍 Spain

University of Zaragoza

Specialized in robotics, Erasmus in TU Wien

Rank: 1/124, most outstanding graduate of my year. Thesis "VSLAM demonstrator with rigid and deformable parts".

WORK EXPERIENCE

Sept 2022 -

Dec 2022



Student Researcher

📍 Switzerland

Google

Software project related with SLAM algorithms aided by neural networks priors. Supervised by Mingyang Li and hosted by Federico Tombari's team.

Aug 2019 -

Feb 2020



Visual-Inertial SLAM intern

📍 Switzerland

Leica Geosystems

Research project with the aim of create a visual-inertial SLAM library named "Leica-UZ Visual-Inertial SLAM", combining VI-ORBSLAM and VINS-Mono. Supervised by Zoltan Toeroek and professors Tardós and Montiel.

Oct 2017 -

Jun 2018



Research Grant

📍 Spain

University of Zaragoza

Extension of the ORBSLAM software to provide it with the capacity to process non-rigid scenes.

PUBLICATIONS

- J. Morlana, JD Tardós, JMM Montiel. **Topological SLAM in colonoscopies leveraging deep features and topological priors.** *MICCAI 2024.*
- J. Morlana, J. Tardós, JMM Montiel. **ColonMapper: topological mapping and localization for colonoscopy.** *ICRA 2024.*
- J. Morlana, JMM Montiel. **Reuse your features: unifying retrieval and feature-metric alignment.** *ICRA 2023.*
- J. Morlana, P. Azagra, J. Civera, JMM Montiel. **Self-supervised Visual Place Recognition for Colonoscopy Sequences.** *MIDL 2021.*
- J. Gómez-Rodríguez, J. Lamarca, J. Morlana, JD Tardós, JMM Montiel. **SD-DefSLAM: Semi-Direct Monocular SLAM for Deformable and Intracorporeal Scenes.** *ICRA 2021.*

OTHERS

I was part of the EndoMapper project, and a key member of its continuation as a spin-off in EndoCartoScope. I speak fluent English, certified by Cambridge and professional experience.