Javier Rodríguez Vázquez

Deep Learning Researcher

Javier Rodríguez Vázquez
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Summary

- Strong background in deep learning and computer vision, spending the last seven years building upon my skills and knowledge in these fields.
- My PhD thesis centers on exploring ways to optimize the training of deep learning models for computer vision tasks by reducing the need for large amounts of labeled data, with the goal of achieving cost savings and increased efficiency.
- Coauthor of 10 research papers in top peer-reviewed journals and conferences.
- Experience working in research teams with interdisciplinary competences, following transversal working methodologies, achieving the enrichment of the projects.

Highlighted Publications

- **Rodriguez-Vazquez, J.,** Prieto-Centeno, I., Fernandez-Cortizas, M., Perez-Saura, D., Molina, M., & Campoy, P. (2024). **Real-Time Object Detection for Autonomous Solar Farm Inspection via UAVs**. Sensors, 24(3), 777.
- **Rodriguez-Vazquez, J.**, Fernandez-Cortizas, M., Perez-Saura, D., Molina, M., & Campoy, P. (2023). **Overcoming Domain Shift in Neural Networks for Accurate Plant Counting in Aerial Images**. *Remote Sensing*, *15*(6), 1700.
- **Rodriguez-Vazquez, J.**, Alvarez-Fernandez, A., Molina, M., & Campoy, P. (2022). **Zenithal isotropic object counting by localization using adversarial training**. Neural Networks, 145, 155-163.
- Sampedro, C., **Rodriguez-Vazquez, J.**, Rodriguez-Ramos, A., Carrio, A., & Campoy, P. (2019). **Deep learning-based system for automatic recognition and diagnosis of electrical insulator strings**. IEEE Access, 7, 101283-101308.
- Rodriguez-Ramos, A., **Rodriguez-Vazquez, J.**, Sampedro, C., & Campoy, P. (2020). **Adaptive inattentional framework for video object detection with reward-conditional training**. IEEE Access, 8, 124451-124466.
- Rodriguez-Ramos, A., Bavle, A. A. F. H., **Rodriguez-Vazquez, J.**, Fernandez-Cortizas, L. L. M., Fernandez, R. A. S., Rodelgo, A., ... & Campoy, P. (2021). **Autonomous Aerial Robot for High-Speed Search and Intercept Applications**. Field Robotics.

Experience

SEDDI Inc., Research Scientist
FEBRUARY 2023-NOW, MADRID

- Member of the Computer Vision and Aerial Robotics Research Group led by Prof. Pascual Campoy.
- PhD candidate with a focus on developing unsupervised and semi-supervised methods for reducing the amount of data required to train deep learning models, with a particular emphasis on domain adaptation and sim-to-real adaptation using adversarial training techniques and self-supervision.
- Developed advanced computer vision algorithms for robotics perception, including the optimization of deep learning models for onboard computation on UAVs using a ROS/C++/CUDA stack
- Demonstrated strong skills in applying expertise to real-world scenarios through 7+ research and industry collaboration projects.
- Published 3 papers in top scientific journals and 6 papers in top international conferences.
- Gained experience in teaching and mentorship through supervision of 10+ students in their Master's and Bachelor's thesis work.

Universidad Politécnica de Madrid, Research Scientist
AUGUST 2017-JULY 2023, MADRID

- Member of the Computer Vision and Aerial Robotics Research Group led by Prof. Pascual Campoy.
- PhD candidate with a focus on developing unsupervised and semi-supervised methods for reducing the amount of data required to train deep learning models, with a particular emphasis on domain adaptation and sim-to-real adaptation using adversarial training techniques and self-supervision.
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Universidad Complutense de Madrid, Research Assistant
NOVEMBER 2016-FEBRUARY 2020, MADRID

- As part of two EU H2020 projects, POLAR-EM and MAGTOOLS, I developed software tools for efficient and reliable analysis of magnetic materials in electron microscopy imaging, enabling advanced research and development in this field.

Altran Spain, Consulting Intern
MAY 2016-NOVEMBER 2016, CÁDIZ

- As an intern at the Altran Innovation Centre for Advanced Manufacturing, I gained experience working with virtual and augmented

reality-based simulators for advanced manufacturing systems and worker training, providing practical and immersive learning opportunities in this field..

Universidad de Cádiz, Research Assistant
SEPTEMBER 2014-MAY 2016, CÁDIZ

- During my time with the Intelligent Computation Systems research group, I focused on using CUDA-enabled GPUs to accelerate tomography reconstruction algorithms for electron microscopy imaging. Additionally, I developed a low-cost system for indoor positioning based on multiview cameras.

Education

Universidad Politécnica de Madrid, Ph. D. in Artificial Intelligence
2018-FEBRUARY 2023, MADRID

Thesis: Adaptive Learning with Weak Supervision for Robotic Perception.

Universidad Politécnica de Madrid, Master's Degree in Artificial Intelligence
2016-2017,MADRID

Universidad de Cádiz, Master's Degree in Research in Systems Engineering and Computer Science
2015-2016, CÁDIZ

Specialization: Research in Computer Science and Neuroinformatics

Universidad de Cádiz, Bachelor's Degree in Computer Engineering
2011-2015, CÁDIZ

Specializations:

- Computer Science and Artificial Intelligence
- Hardware Engineering

Other

- International robotic competitions awards:
  - MBZIRC Grand Challenge: 3rd Position, Skyeye Team
  - OpenCV AI Competition, Intel and Azure: 3rd Position Europe+Russia+Australasia Oct 2021
  - RAMI: Robotics for Asset Maintenance and Inspection: 2nd Position, , IROS 2021

References

- Pascual Campoy, PhD: Current advisor and full professor at UPM. Email: pascual.campoy@upm.es
- Martin Molina, PhD: Current advisor and full professor at UPM. Email: martin.molina@upm.es
- Maria Varela, PhD: Full professor at UCM. Email: mvarela@ucm.es