DIEGO PATIÑO

Machine Learning and Computer Vision Engineer

SKILLS

- **Python/Numpy/SciPy** 8+ yrs
- **Pytorch/tensorflow** 3+ yrs
- **GIT** 7+ yrs
- **Linux** 15+ yrs
- **Matlab** 4+ yrs
- **Java** 2+ yrs
- **C++/CUDA** 2+ yrs

LANGUAGES

- **Spanish** native
- **English** fluent
- **Portuguese** good

CONTACT

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PROFILE

I am an experienced engineer looking to apply my passion, skills, and expertise in machine learning and computer vision to a new R&D role. I am passionate about conceiving, designing, and coding solutions to engineering problems at the intersection of computer vision, 3D reconstruction, and machine learning.

Throughout my career as a researcher and software developer, I have acquired extensive skills and experience leading and collaborating within and between interdisciplinary teams. I have experience building models, data pipelines, and computational tools based on state-of-the-art machine learning frameworks.

WORK EXPERIENCE

Post-Doctoral Researcher Apr. 2020 - Present
University of Pennsylvania
General Robotics, Automation, Sensing & Perception Lab

My current work includes conducting and leading independent research on machine learning and geometric computer vision, shape reconstruction, video prediction, and physics-informed machine learning. I work under the supervision of Prof. Kostas Daniilidis.

Visiting Researcher Feb. 2018 - Apr. 2020
University of Pennsylvania
General Robotics, Automation, Sensing & Perception Lab

I worked on deep learning and geometric computer vision research under the supervision of Prof. Kostas Daniilidis.

Software Developer Mar. 2016 - Feb. 2018
Gotta Ingenieria
https://gottaingenieria.com

In this position I designed and developed several python-based hydromorphology simulation plug-ins for ArcGIS.

Software Developer Jun. 2016 - Dec. 2016
Launchpad
https://www.launchpadapps.com.au

Primary responsibilities included developing client/server mobile apps for the iOS platform in Objective C and Swift programming languages.

Assistant Researcher Jul. 2014 - Jul. 2015
University of Wisconsin-Madison
Laboratory for Molecular and Computational Genomics

I conducted research on the development of new computer vision approaches for detection, sequencing, and alignment of single DNA molecules under confinement. I worked under the supervision of Prof. David C. Schwartz.

EDUCATION

2014 - 2020

Ph.D. Computer Engineering
National University of Colombia
Medellin, Colombia

The topic of my Ph.D. dissertation was "Shape Analysis and Description Based on the Isometric Invariances of Topological Skeletonization". My research focused on shape analysis with applications on shape retrieval and shape classification. In my dissertation, I designed an equivariant feature descriptor to classify shapes based on the properties of their Medial Axis.

I successfully applied the approach developed in my work to the problem of pose-invariant shape classification and retrieval in 2D and 3D. All the methods and algorithms in my Ph.D. research were designed and coded using state-of-the-art technologies including data parallelism and GPU-enabled frameworks.

2010 - 2012

M.Sc. Computer Engineering
National University of Colombia
Medellin, Colombia

The topic of my master's thesis was "Automatic landform classification using texture analysis on satellite images."

2005 - 2010

B.S.E. Computer Engineering
National University of Colombia
Medellin, Colombia

Software Engineer Aug. 2012 - Jun. 2014
Early Warning System of the City of Medellín
https://siata.gov.co

In this role, I developed software tools for weather forecasting and created software to support geospatial data visualization. Additionally, I developed computer vision tools to process images generated from Doppler microwave weather radars.

Research Assistant Jan. 2012 - Jul. 2012
Pontifical Catholic University of Chile
Department of Computer Science

I conducted research on computer vision techniques applied to geo-spatial information, and automatic classification of landforms. I worked under the supervision of Prof. Domingo Mery.

SELECTED PUBLICATIONS

2022 **Patiño, D., Mayya, S., Calderon, J., Daniilidis, K., and Saldaña, D.**, "Learning to Compensate Wind Turbulence with a Team of Robots: A Reinforcement Learning Approach", Robotics and Automation Letters , Under revision.

2022 **Patiño, D., Schmeckpeper, K., Gupta, H., Georgakis, G., and Daniilidis, K.**, "Self-supervised implicit shape reconstruction and pose estimation for video prediction", ICRA Workshop on Motion Planning with Implicit Neural Representations of Geometry - 2022 .

2022 **Patiño, D., Esteves, C., and Daniilidis, K.**, "Level Set Mesher: Single-image to 3D reconstruction by following the level sets of the signed distance function", ICPR 2022 .

2021 **Patiño, D., and Branch, J.W.**, "Cosine-Pruned Medial Axis: A New Method for Isometric Equivariant and Noise-Free Medial Axis Extraction", IEEE Access , https://doi.org/10.1109/ACCESS.2021.3072933.

2020 **Patiño, D., Ceballos-Arroyo, A. M., Rodriguez-Rodriguez, J. A., Sanchez-Torres, G., and Branch-Bedoya, J. W.**, "Melanoma detection on dermoscopic images using superpixels segmentation and shape-based features", 15th International Symposium on Medical Information Processing and Analysis , https://doi.org/10.1117/12.2545300.

2018 **Patiño, D., Avendaño, J., and Branch, J.W.**, "Automatic skin lesion segmentation on dermoscopic images by the means of superpixel merging", International Conference on Medical Image Computing and Computer-Assisted Intervention (MICCAI) , https://doi.org/10.1007/978-3-030-00937-3_83.

2017 **de León, J.C.B., Patiño, D., Restrepo, A., and Branch, J.W.**, "Computational Detection of Salient Information to Identify High Stress and Ambiguity Regions in Digital Photoelasticity Images", Image Processing and Applications (IM4E) , https://doi.org/10.1364/ISA.2017.IM4E.2.

2015 **Zhou, S., Goldstein, S., Place, M., Bechner, M., Patiño, D., Potamousis, K., Ravindran, P., Pape, L., Rincon, G., Hernandez-Ortiz, J., Medrano, J. F. and Schwartz, D. C.**, "A clone-free, single molecule map of the domestic cow (Bos taurus) genome", BMC Genomics , https://doi.org/10.1186/s12864-015-1823-7.