Alan Preciado Grijalva

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Education

University of Applied Sciences Bonn-Rhein-Sieg, Germany Mar 2019 - Nov 2021
M. SC. AUTONOMOUS SYSTEMS - CURRENT GPA 1.94/4.0 (1.0 IS MAXIMUM GRADE)

Major in Machine Learning
Relevant Coursework: Artificial Intelligence, Machine Learning, Neural Networks, Deep Learning, Natural Language Processing, Mathematics for Robotics and Control, Robot Perception

Thesis: Self-supervised Learning for Sonar Images: Enhancing Multimodal Perception for Underwater Applications

Autonomous University of Baja California, Mexico Feb 2013 - Dec 2017
B. SC. PHYSICS - GPA 94.45/100 (100 IS MAXIMUM GRADE)

Honors Degree
Thesis: Microstructures for a Scalable Multi-layer Ion Trap for Quantum Information Processing

University of Gottingen, Germany Aug 2016 - Aug 2017
B. SC. PHYSICS STUDENT EXCHANGE

DAAD Scholarship Holder
Relevant Coursework: Biophysics, Statistical Mechanics, Soft-matter, Machine Learning

Work & Research

Machine Learning Research Assistant Oct 2020 - present
GERMAN RESEARCH CENTER FOR ARTIFICIAL INTELLIGENCE (DFKI) GMBH, BREMEN, GERMANY

- Project: Improve the perception capacities of underwater systems using deep learning multi-modal approaches
- Contribution: Implemented self-supervised learning algorithms in tensorflow for underwater sonar image classification, and image translation algorithms for image enhancement
- Contribution: creation of a new underwater image dataset, implemented ROS nodes for data logging (camera-sonar), post-processing hundreds of gigabytes of data
- Impact: Team will benefit from created dataset, poster publised at conference, algorithms implemented on pair with supervised approaches

Machine Learning Research Assistant Aug 2019 - Mar 2021
FRAUNHOFER INSTITUTE FOR ALGORITHMS AND SCIENTIFIC COMPUTING (SCAI), BONN, GERMANY

- Project: Detect anomalies due to ice acummulation in wind turbines, achieve high-quality reconstruction of 3D CFD turbulence data
- Contribution: Performed unsupervised anomaly detection of time series using generative models (Variational Autoencoders). Achieved 96% classification accuracy on custom wind turbine simulation time series data
- Contribution: Implemented Convolutional Variational Autoencoders on 2D and 3D turbulent data for high-quality reconstruction and generation.
- Impact: Provided first insights into wind turbine data interpretability, results were presented to partner company

Technical Consultant Oct 2018 - Mar 2019
UNITED HEALTH GROUP INC., CYPRESS, UNITED STATES

- Contribution: Developed tools using relational databases (SQL and Microsoft Access) to automate the workflow for the creation of contracts. This reduced time taken to generate contracts significantly.

Physics Research Assistant Mar 2017 - Sep 2017
NATIONAL METROLOGY INSTITUTE OF GERMANY (PTB), BRUNSWICK, GERMANY

- Project: Design, build, characterize and experiment with novel ion traps for quantum computing
- Contribution: Built and characterized state-of-the art micro semiconductors (ion traps) for quantum computing experiments
- Contribution: Worked in ultra clear room systems doing gold layer deposition, sputtering, performed ion trap characterization via high resolution microscopy and electrical breakdowns
- Impact: Results helped my group understand better the limits and operating conditions of multilayered ion traps, paper published, conference presentation

Publications

Alan Preciado-Grijalva. Self-supervised Learning for Sonar Images: Enhancing Multimodal Perception for Underwater Applications. Bonn-Rhein-Sieg University of Applied Sciences, Master Thesis Report, December 2021.

Alan Preciado-Grijalva, Rodrigo Iza-Teran. Anomaly Detection of Wind Turbine Time Series using Variational Recurrent Autoencoders. arXiv, December 2021.

Venkata Santosh Muthireddy*, **Alan Preciado-Grijalva***. Evaluation of Deep Neural Network Domain Adaptation Techniques for Image Recognition. arXiv, October 2021.

Matias Valdenegro-Toro, **Alan Preciado-Grijalva**, Bilal Wehbe. Pre-trained Models for Sonar Images. Global OCEANS, 2021.

Ramon F. Brena, Evelyn Zuvirie, **Alan Preciado**, Aristh Valdiviezo, Miguel Gonzalez-Mendoza Carlos Zozaya-Gorostiza. Automated evaluation of foreign language speaking performance with machine learning. International Journal on Interactive Design and Manufacturing (IJIDeM), 2021.

Alan Preciado-Grijalva. Generative Models for the Analysis of Dynamical Systems with Applications. Bonn-Rhein-Sieg University of Applied Sciences, Technical Report, October 2020.

A. Bautista-Salvador, H. Hahn, G. Zarantonello, **A. Preciado-Grijalva**, J. Morgner, M. Wahnschaffe, C. Ospelkaus. Multilayer ion trap technology for scalable quantum computing and quantum simulation. New Journal of Physics, 2019.

Alan Preciado-Grijalva, Ramon Brena. Speaker fluency level classification using machine learning techniques. Arxiv, 2018.

Posters

LatinX in Computer Vision at ICCV	Oct 2021
International Meeting of Artificial Intelligence and its Applications (RIIAA)	Aug 2018
Quantum Information Division annual meeting (DICU)	Sep 2015 & 2017
National Nanoscience and Nanomaterials Symposium (CNyN)	May 2016

Internships

Junior Software Engineer — Jan 2018 - Apr 2018
SOFTTEK, ENSENADA, MEXICO

- Designed a webapp using .NET technologies with an emphasis on entity framework. Tools used: C#, SQL, CSS and Javascript

Machine Learning Intern — May 2018 - September 2018
INSTITUTO TECNOLOGICO DE MONTERREY (ITESM), MONTERREY, MEXICO

- Implemented pipelines to train machine learning models for classification of audio segments from human conversations

Physics Research Intern — Jun 2015 - September 2015
JOINT QUANTUM INSTITUTE (JQI), UNIVERSITY OF MARYLAND, USA

- Built an optical switch using tapered optical nanofibers to be able to manipulate the transmission intensity of a 1064 nm laser

Selected Projects

Image Captioning with Attention: Deep networks with attention for image captioning	Jun-Jul 2020
Deep Learning for Domain Adaptation (DA): Benchmarking SOTA DA neural networks	Feb-Apr 2020
Rosbag Analyzer: Visualize Rosbag topics as an interactive web timeline	Oct 2019 - Jan 2020
Environmental Sound Classification: Benchmarking CNNs for audio event classification	May-Aug 2018

Skills

Programming / Frameworks: Python, C#, Matlab, Pytorch, Tensorflow 2, Keras, ROS, Flask
Libraries / Tools: OpenCV, Scikit, Pandas, Numpy, Seaborn, Git, Linux, LaTeX
Languages: Spanish (native), English (Toefl IBT 106), German (B2.2)