# 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 3.72/4.0

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 4.0/4.0

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 & Research Talks

Venkata Santosh Muthireddy*, **Alan Preciado-Grijalva***. Evaluation of Deep Neural Network Domain Adaptation Techniques for Image Recognition. Arxiv, 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**, Rodrigo Iza-Teran, Paul G. Ploeger. Generative Models for the Analysis of Dynamical Systems with Applications. Bonn-Rhein-Sieg University of Applied Sciences, Technical Report, 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

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| LatinX in Computer Vision at ICCV2021 | 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)