

Diego Porres

PURE & APPLIED MATHEMATICIAN · PHYSICIST

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Education

Università degli Studi dell'Aquila / Université Nice-Sophia Antipolis

L'Aquila, Italy / Nice, France

MSC. IN MATHEMATICAL ENGINEERING / LAUREA MAGISTRALE IN INGEGNERIA MATEMATICA

MASTERS OF MATHEMATICS AND INTERACTIONS / MASTER DE MATHÉMATIQUES ET INTERACTIONS, WITH SPECIALTY IN PURE AND APPLIED MATHEMATICS

Sept. 2015 - Sept. 2017

- Received a double degree for the Mathematical Modelling in Engineering (MathMods) Erasmus Mundus Master program.
- Received a Erasmus Mundus (Erasmus+) Scholarship that are awarded to the most talented applicants who will be full-time students enrolled in the MathMods MSc course, based on the ranking made by the MathMods Evaluation Committee.
- Emphasis on last semester was on mathematical modelling applications to Finance with courses on Stochastic Calculus, Stochastic Control, Statistics and Numerical Methods.

Modelling Camp (05/2016 - 06/2016): Development of a mathematical framework for describing pedestrian motion and crowd dynamics. The implementation and simulation was done with MATLAB.

Hamburg, Germany

Thesis title: Reinforcement Learning for Self-Driving Cars

Internship Report

Universidad del Valle de Guatemala

Guatemala City, Guatemala

BACHELOR OF SCIENCE, MAJOR IN PHYSICS

Jan. 2007 - Nov. 2012

- Theoretical physics, from Classical to Modern Physics, with numerical analysis of modern physics experiments.

Thesis title: Quality Control in the Information Acquisition of the patient using the CAT3D Computerized Planning System for Cancer Treatment

Internship Report

Internships

Computer Vision Center (CVC) / Advanced Driver Assistance Systems (ADAS)

Barcelona, Spain

GRADUATE RESEARCH INTERN

May 2017 - Oct. 2017

- Researched how the state-of-the-art algorithm (specifically, the A3C) in Reinforcement Learning can be applied to self-driving cars.
- Used Atari 2600 games and flash games via OpenAI's Gym and Universe environments to test and train agents.
- Researched other possible new algorithms and technologies that self-driving cars can use to realize specific tasks, such as avoiding pedestrians.

Supervisor: Antonio M. López, PhD., head of R&D Group ADAS

Clínica de Radioterapia La Asunción / Radiotherapy Clinic La Asunción

Guatemala City, Guatemala

RESEARCH INTERN

March 2011 - May 2012

- Aided in the different phases of radiotherapy in the clinic, from planning, calibration of the linear accelerator, molds creation, aiding the control room of the linear accelerator, to radiosurgery.
- Conducted quality control tests on the CAT3D software used in the clinic for the planning of radiotherapy sessions and radiosurgery as part of the thesis for the BSc. in Physics.

Supervisors: Erick Estuardo Hernández García, MSc. & Ricardo E. Contreras Folgar, MSc.

Software Skills

PROGRAMMING / SOFTWARE

> 4 years **Python** Numpy, Jupyter, Matplotlib, Scipy, Tensorflow, Keras, Pandas, Scikit-learn

2.7, 3.5+

> 1 year **R & MATLAB** MATLAB R2014a

< 1 year **C++ & C**

C++11

> 2 years **LaTeX**

OPERATING SYSTEMS

> 5 years **Windows** XP, 7 & 10

1 year **Ubuntu** 16.04

Other Experience, Schools & Workshops

Lecturer at the Universidad del Valle de Guatemala

Guatemala City, Guatemala

COURSES: PHYSICS 1 AND MODERN PHYSICS LAB

July 2018 - Present

- Designed lectures, homeworks, and tests for the course of Physics 1.
- Run the laboratory and setup of experiments for the course of Modern Physics.

March 2018 Piscine/Intensive Basic Training

Fremont CA, U.S.A.

42 SILICON VALLEY

March 12 - April 6, 2018

- Intensive, 7-day a week training for programming on C.
- The basic training worked as part of the admission process to enter the 42 School Silicon Valley program.
- Final result: **Accepted**.

Andean Symposium of Relativistic Astrophysics

Bucaramanga, Colombia

ADVANCED TOPICS IN RELATIVISTIC ASTROPHYSICS.

June 10-12, 2015

- Numerical methods for finding solutions to Einstein's Field Equations of General Relativity.
- Attended lectures on the algorithms, codes and implementation of the numerical methods and state-of-the-art results in General Relativity.
- The coding laboratories were implemented on the Linux environment.

Lecturer at the Universidad Francisco Marroquín

Guatemala City, Guatemala

COURSES: STATISTICAL THINKING AND DATA ANALYSIS & CALCULUS 3.

July 2014- May 2015

- Designed syllabus, lectures, homeworks and tests for both courses.
- The students attending the lectures were from the Faculty of Economical Sciences (FCE).

United States Particle Accelerator School (USPAS).

Knoxville TN, U.S.A.

MICROWAVE LINEAR ACCELERATORS

Jan. 20 - 31, 2014

- Intensive two-week graduate course on Microwave Linear Accelerators.
- The course consisted of lectures in the morning/afternoon, with some computer laboratory exercises in between.
- Final grade: **A-**.

CERN Accelerator School

Granada, Spain

INTRODUCTION TO (PARTICLE) ACCELERATOR PHYSICS

Oct. 28 - Nov. 9, 2012

- Introductory particle accelerator topics: from relativity to linear accelerators.
- Higher level particle accelerator topics: particle sources to warm magnets.

Teaching Assistant at the Universidad Francisco Marroquín

Guatemala City, Guatemala

COURSES: PHYSICS 1, CALCULUS 1, MATHEMATICAL ANALYSIS 1 & 2 AND LOGISTICS & SUPPLY CHAIN MANAGEMENT

July 2011 - May 2014

- Delivered tutorials to the undergraduates attending these courses.
- Involved in the development of new material, as well as the grading of quizzes and homework.

Research Assistant in the Centro de Estudios Atitlán (Center for Atitlán Studies)

*Guatemala City & Lake Atitlán,
Guatemala*

COURSE AND RESEARCH ON AQUATIC ECOLOGY.

March 2010 - May 2010

- Assisted in research of proliferation of the cyanobacteria *Lyngbya Robusta* on Lake Atitlán, Guatemala.
- The course and research was conducted by MSc. Margaret Ann Dix, laboratory chief at the Centro de Estudios Atitlán (CEA).

Teaching and Laboratory Assistant at the Universidad del Valle de Guatemala

Guatemala City, Guatemala

COURSES: PHYSICS 2, GENERAL PHYSICS, AND MODERN PHYSICS

Jan. 2009 - Nov. 2010

- Delivered tutorials to the undergraduates attending these courses, as well as the grading of quizzes and homework.
- Involved in the development of new experiments for the students to better understand the concepts taught during the lectures.

Online Degrees / Specializations

Introduction to Deep Learning

[Coursera](#)

ADVANCED COURSE ON DEEP LEARNING

November 2018

- Part of the Advanced Machine Learning specialization from the National Research University Higher School of Economics.
- Course covered optimization, CNNs, autoencoders, GANs, RNNs and word embeddings.
- Course completed with honors.

Machine Learning

[Coursera](#)

SUPERVISED LEARNING, UNSUPERVISED LEARNING, AND BEST PRACTICES IN MACHINE LEARNING

September 2018

- Learned classical Machine Learning algorithms, such as Linear Regression, Logistic Regression, Neural Networks, Support Vector Machines, and best practices/techniques for each algorithm.
- Lab sessions were done in MATLAB/GNU Octave.

Deep Learning Specialization

[Coursera](#), [deeplearning.ai](#)

NEURAL NETWORKS, THEORY AND APPLICATIONS

March 2018

- Obtained the Deep Learning Specialization from Coursera, which consisted of five interconnected courses.
- All algorithms were built first by using NumPy and we later moved to higher level packages like Tensorflow and Keras.
- The courses concentrated on theory and their applications in industry, like Computer Vision, Natural Language Processing, Speech Recognition, among others.

Languages (CEF Scale)

Spanish **Mother Tongue / Level C2**

English **Proficient User / Level C2**

French **Independent User / Level B1**

Italian **Basic User / Level A2**

Volunteer Work

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|-----------|--|-----------------------------------|
| 2009-2015 | Volunteer Worked on fundraising and construction of transitional houses in TECHO, a youth-led non-profit organization that seeks to overcome poverty in slums in Latin America & the Caribbean. | TECHO - Guatemala |
| 2010-2011 | Volunteer Coordinator - UVG Coordinated activities for TECHO, as well as the recruiting of new volunteers that were attending lectures at the Universidad del Valle de Guatemala (UVG). | TECHO - Guatemala |