Rui Marques

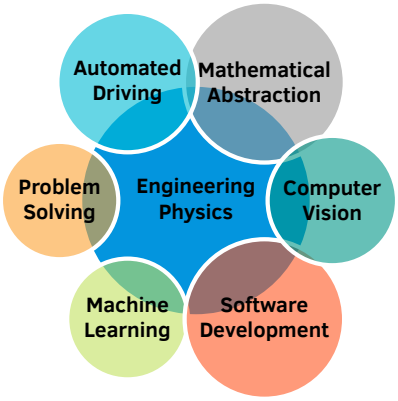
Software Engineer

About Me

Deep Learning, Computer Vision and

C++/python developer with an academic background in Theoretical Physics and Engineering.

I am able to cope and adapt to new and challenging tasks. My main motivation is tackling interesting problems. I consider myself reasonably good self-learner.



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Experience

April 2018 – Present
Deep Learning ADAS Software Engineer — Xesol Innovation
Vigo, Spain

- Kept up to date with detection and segmentation state-of-the-art Convolutional Neural Networks.
- Managed internal and public datasets, their synthetic augmentation, training, hyperparameter tuning, validation and model exporting to different frameworks.
- Integration of deep learning models in C++ for real-time commercial applications with severe hardware constraints.
- Developed a perception and fusion logic layer from scratch that leverage data from neural networks and other software modules. Implemented an Extended Kalman Filter to get a smooth and reliable representation of the environment.
- Managed and maintained the entire core of the ADAS software.
- **Tools:** C++, python, tensorflow, tensorflow C++ API, CLion, caffe, tf-slim, keras, OpenCV, CUDA, matplotlib, numpy, bash, git, doxygen, cmake, Makefile, redmine, LaTeX

Jan 2018 – Mar 2018
ADAS Software Developer — CTAG
Vigo, Spain

- Worked in the beginning in an internal project as a LiDAR preprocessing developer for a self driving car.
- Due to my good performance and quick learning, the company transfered me to a special task force that works directly to a client.
- Picked up the entire code base from a departing former employee and build up on that.
- Managed, proposed and reviewed System and Software Requirements.
- Developed and maintained software at the Client's request always with quality and before the requested deadlines.
- Kept an efficient communication with the Client.
- Performed weekly software verifications: sanity checks, runtime checks, code coverage tests, static tests (code linting against MISRA-C++) and reported them to the Client.
- **Tools:** C++, ADTF, Eclipse, Qt, python, matplotlib, numpy, bash, Matlab, redmine, git, Octave, MSVS, doxygen, cmake, CANalyzer, CANoe, Wireshark, Makefile, JIRA, Serena, DOORS, Google Docs, html, xml, LaTeX
- **Attended Courses:** V Life Cycle, Management of Requirements, Automotive SPICE, ISO26262, DOORS, SCRUM

Education

Sep 2016 – Jun 2017
Erasmus Theoretical Physics — ITF, Utrecht University
Utrecht, Netherlands
Studied Quantum Information and Cosmology topics. Academic Referee: Enrico Pajer (e.pajer@uu.nl) | GPA: 8/10

Sep 2012 – Feb 2018
MSc in Engineering Physics — Instituto Superior Técnico
Lisbon, Portugal
High Energy Theoretical Physics specialization
Thesis: Massive Graviton Theories and vDVZ discontinuities

- Worked on an extension of Einstein's General Relativity in which the graviton has a non zero mass and worked out its possible implications to experimental results such as gravitational waves.
- **Tools**: Python, scikit-learn, LaTeX, matplotlib, Mathematica, gnuplot

Programming

C • C++ • LaTeX • python • Mathematica

Matlab • ADTF • CUDA • OpenMP

gnuplot • javascript

HTML5 • Java

Languages (A1 to C2)

English

Portuguese

Spanish

French • Polish

Scholarships & Certificates

Oct 2017 **Neural Networks and Deep Learning by deeplearning.ai** Coursera

Oct 2017 **Improving Deep Neural Networks: Hyperparameter tuning, Regularization and Optimization by deeplearning.ai** Coursera

May 2012 **Nacional Finalist** Astronomy and Astrophysics Portuguese Olympiads
São Miguel, Azores, Portugal

Jan 2012 – May 2012 **Advanced precollege physics school** Quark! Project
Coimbra, Portugal

Programming Projects

Oct 2017 – Nov 2017 **Space Out** github.com/ruifm/space-out
pygame 1 vs 1 version of the classic arcade game 'Asteroids'. Intended for training of a reinforcement learning neural network to work as an AI opponent.

Dec 2016 – Jan 2017 **Entanglement Entropy** github.com/ruifm/ed-triangular
Mathematica notebook for the exact digitalization and Entanglement Entropy computation in a Triangular Spin lattice.

May 2015 **Oort Cloud** github.com/ruifm/oort
A javascript version using the Phaser framework of the classic arcade game 'Asteroids', modified by giving it a little bit of a 'flappy bird' tone, i.e. a never ending game. Hosted here: xente.mundo-r.com/20624313W0001/index.html

May 2014 **Antifitter** github.com/ruifm/antifitter
C++ program that yields fake experimental data to fit a certain function and plots it automatically.

Dec 2013 – Jan 2014 **Gross-Pitaevskii Simulator** github.com/ruifm/gross-pitaevskii
Color density plot simulation of the Gross-Pitaevskii equation applied to a Bose-Einstein Condensate using C++, OpenMP and CUDA. Result: youtu.be/V091IqIRV4c

Dec 2012 – Jan 2013 **Coloumbian Simulator** github.com/ruifm/charges
Coulomb force in charges simulator written in C with GTK+.

Nov 2012 **Atkin's Sieve in C** github.com/ruifm/atkin
Atkin implementation for finding prime numbers in C with many features.

Projects and Affiliations

Feb 2014 **Co-host and Organizer** Engineering Physics Days
Lisbon, Portugal
A 3 day event with physics and engineering seminars from researchers and potential employers. I led a 7 people task force to put together this amazing event.

Sep 2013 – Sep 2014 **Science entertainer** Festa do Avante
Amora, Lisbon, Portugal
Performed live physics experiments to the general public during the *Avante* Summer festival.

2012 – 2015 **Board Member** NFIST member (IST physics club)
Lisbon, Portugal
A dynamic and productive non-profitable organization with tremendous scientific outreach. It's main goal is to create public awareness to the beauty and omnipresence of physics in our daily lives. I've been and active science speaker in public schools, museums and other events.

Sep 2012 **Staff member** CMS Week 2012
Lisbon, Portugal
I was invited by a LIP physicist (former advisor) to be a part of the organizing committee responsible for hosting the event. I had the opportunity to meet renowned physicists worldwide.