EDUARDO RAMOS FERNANDEZ

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+ PROFESSIONAL PROFILE

I am a PhD student with solid background in Computational and Materials Science. Experienced in working in a mixed industry-academia research environment. Interest in raising the awareness of the importance of good software development practices among the scientific community. Proficient Linux user for more than 10 years. Formal and self-training in computer science related fields like networking, Operating Systems, algorithms and data structures. Formal background in numerical methods and physical modelling at different scales (continuum, atomistic, quantum). Heavy user of HPC facilities for more than three years with emphasis on seamless deployment of multi-scale parallel codes. Heavily interested currently in learning data science and machine learning techniques. I am looking for opportunities to apply my multidisciplinary background on solving real-life problems using modern computational tools.

+ EDUCATION

2015 - Current — ***PhD "Coupled MD-CFD simulations of hydrodynamic lubrication", Imperial College London***

Supervised by Prof. Daniele Dini – due to submission October 2018

This is an industrially-led project funded by BP-ICAM (International Centre for Advanced Materials) organisation. Using a hybrid atomistic-continuum computational method, I perform numerical studies of the behaviour of thin-film lubricants. A software package to build, deploy and perform multi-scale simulations of hydrodynamic lubrication will be delivered at the end of the project to BP's lubricants division (Castrol).

2014 - 2015 — ***MSc (Distinction), Theory and Simulation of Materials, Imperial College London***

Relevant modules covered – Advanced Maths, Methods for Simulating Materials, Computational Methods.

Group programming project - As part of a group of five students, a Tight Binding molecular dynamics code was developed to model the dynamics of carbon structures.

MSc dissertation - "Atomistic Modelling of Hydrodynamic Lubrication". Supervised by Prof. Daniele Dini, Tribology Group, Imperial College London

2010 - 2014 — ***BSc (First class), Materials Engineering, Universidad Politecnica de Madrid, Madrid, Spain***

Engineering degree oriented to Material Science with a major in Semiconductor Materials.

Final year dissertation – "Modelling heat transfer in Ni-Fe ferro-magnetic nanowires". This work led into two publications on international high impact factor Physics journals. Supervised by Dr. Jose Luis Prieto, ISOM UPM.

2007 - 2010 — ***BSc (First class), Computer Science, Universidad de La Laguna, Tenerife, Spain***

Engineering Computer Science degree with a major in electronic systems.

Final year projects – A set of projects from final year modules were used to evaluate the student. Some of them included:

- ✔ Robotics: Development of a semi-autonomous remote controlled robot with a Wii nunchuck using microcontrollers
- ✔ Networking: Programming a parallel HTTPv1.0 web server
- ✔ Compilers: Development of a front-end for a subset of the Pascal language (gcc back-end)

+ SCIENTIFIC PUBLICATIONS

2017 — López, C., Ramos, E., Muñoz, M., Kar-Narayan, S., Mathur, N. D., & Prieto, J. L. (2017). *Influence of the thermal contact resistance in current-induced domain wall depinning*. Journal of Physics D: Applied Physics, 50(32), 325001.

2015 — Ramos, E., López, C., Akerman, J., Muñoz, M., & Prieto, J. L. (2015). *Joule heating in ferromagnetic nanostripes with a notch*. Phys. Rev. B, 91(21), 214404.

+ KEY SKILLS

Computer Science

- ✔ Extensive programming experience: C++, Python and Matlab/Octave.
- ✔ Limited programming experience: Java, Fortran, PL/SQL
- ✔ Experience with web technologies HTML/CSS/JavaScript
- ✔ Expertise in designing, debugging and building distributed (MPI) and parallel codes (threads)
- ✔ Data visualization using open-source tools (gnuplot, matplotlib)
- ✔ Building and deploying software using Conda package manager (anaconda cloud channel → edu159)
- ✔ Intermediate Linux System Administration skills
- ✔ Knowledge about electronics and embedded systems (microcontrollers)
- ✔ Unit testing and Continuous Integration (Google Test, pytest, Travis)
- ✔ Numerical libraries: scipy, numpy

Modelling and Simulations

- ✔ Expertise in numerical methods for solving PDEs (FDM, FEM, FVM)
- ✔ Experience with general stochastic and deterministic algorithms for optimisation
- ✔ Strong background in atomistic modelling using molecular dynamics
- ✔ Fluid dynamics software (FVM): OpenFOAM
- ✔ Molecular dynamics software: LAMMPS
- ✔ FEM software: COMSOL Multiphysics
- ✔ Multidisciplinary background which allows me to understand systems from a wider perspective (materials → components → devices → system)
- ✔ Multi-scale modelling experience, fundamental to tackle modern physical problems

Communication Skills

- ✔ Monthly presentations to my industrial sponsor has helped me to train myself on how to effectively deliver results and progress to people working in industry
- ✔ Presentations at international conferences for 50+ people from academia and industry
- ✔ Skills in developing infographics and data charts to effectively communicate scientific results

Problem Solving

- ✔ Being a PhD student with strong bonds to the industry has allowed me to step out of the pure academic research and think ahead on how my research should, in last instance, tackle real-life scientific problems.

+ RECENT ACTIVITY

2014 — *Google Summer of Code Studentship* – Worked for the Octave open-source project implementing sparse matrix LU decomposition algorithms for preconditioning. Invited to present my work in OctConf2014 (Montreal, Canada).

2015 - 2017 — *Teaching assistant in Computational Methods (MSc module in the TSM-CDT , Imperial College London)* – Imperial College London, London, UK

2015 - 2017 — *Co-developer of CPL library* (www.cpl-library.org) – Multi-language MPI library to efficiently couple two arbitrary parallel CFD and MD codes by domain decomposition. It is designed using modern software engineering practices: unit testing, C.I, automated documentation, etc. A framework of coupled apps has been devised where different MD and CFD solvers can be coupled in a plug&play fashion using the interface provided by the library and ultimately compiled off-site in a VM as Conda packages. Those packages can be installed without the need of compilation in any HPC using Conda package manager without the intervention of HPC admins.

2017 — *Developer of an HPC Android app* – It is mobile phone app intended to manage, in a user-friendly manner, jobs running on an HPC.

2016-2017 — *Promotional video for the Theory and Simulation of Materials CDT* – I was part of a group of 5 CDT students to create a video to showcase the CDT. Link: *https://www.youtube.com/watch?v=BauID1jWKvI*

2017 — *Tutor of the course "Introduction to Scientific and Engineering Python"* - Course delivered to 40 Rolls Royce engineers - Derby, UK

2017 — *Pain Relief for Scientific Computing fair* – This is a fair created with the aim of providing new CDT and PhD students an overview of modern scientific computing tools and best practices. I was in charge of the HPC stand – Imperial College London, London, UK

+ OTHER SKILLS AND INTERESTS

Football

- ✔ Played semi-professionally until I was 20 and currently casual 5 and 7 a side player

Cooking

- ✔ Very capable chef at home. Mastering recipes from all over the world

Languages

- ✔ Full professional proficiency in English
- ✔ Native Spanish
- ✔ Basic Italian and French