

Javier Fernández-Marqués

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SUMMARY

I am a second-year DPhil (PhD) student at the University of Oxford working under the supervision of Nicholas Lane. My research focuses on designing deep neural network architectures that can run efficiently under very constrained platforms, such as microcontrollers. In particular, I am interested in designing network architectures that, in combination with compression techniques, enable the deployment of complex models on constrained setups where energy is the main limitation factor (e.g. devices running on batteries). I have two years of industry experience designing real-time computer vision applications for the sport and fashion retail sectors.

EDUCATION

UNIVERSITY OF OXFORD

Oxford, UK

DPhil (PhD) Candidate in Computer Science

Oct. 2017 – 2021 (expected)

- **Theme:** Deep Learning under Resource Constrained Platforms
- Supervised by Associate Prof. Nicholas D. Lane
- Teaching Assistant in Deep Neural Networks course for MSc students.

QUEEN MARY, UNIVERSITY OF LONDON

London, UK

MSc in Computer Vision (Distinction)

Sept. 2014 - Sept. 2015

- **Thesis:** Pedestrian detection from varying viewing angles (89/100)
- Supervised by Professor Andrea Cavallaro

TECNUN, UNIVERSITY OF NAVARRA

San Sebastián, Spain

BSc in Telecommunications Engineering

Sept. 2010 - May 2014

- **Thesis:** Collagen Mesh Detection and Quantification in Reflection Microscopy (100/100)
- Co-supervised by Professor Carlos Ortiz-de-Solórzano and Associate Prof. Arrate Muñoz

EXPERIENCE

HOLITION

London, UK

Computer Vision Engineer

Oct. 2016 - Oct. 2017

- Lead computer vision and machine learning engineer developing AR applications for the fashion retail sector. Research and implementation of low-level computer vision techniques suitable for real-time execution on hand-held devices (smartphones, tablets)
- Maintained and enhanced our in-house lightweight face tracking algorithm.
- Worked on full application cycle: design, prototyping, implementation and optimisation.

HAWK-EYE INNOVATIONS (SONY)

Basingstoke, UK

Software Engineer

Feb. 2016 - Oct. 2016

- Research and implementation of low-level image processing (demosaicing and colour correction) and multi-camera calibration algorithms. Improved UI and UX of a camera calibration software used in hundred of sport events through the year.
- Improved the multi-camera player tracking module used in tennis matches.

FRAUNHOFER IIS

Erlangen, Germany

Research Intern

Summer 2014

- Investigated Literature on stereo vision and implemented a state of the art stereo-vision algorithm to extract the depth-maps from a scene using a multi-camera array.

CIMA
Research Intern

Pamplona, Spain
Jun. 2013 - Jun. 2014

- Algorithm implementation to extract and analyse the 3D network architecture of collagen-based matrices in the presence of cancer cells. Developed GUI that engineers and biologists can use to setup their experiments. Publications in ICIP and EMBC.
- Worked in a multidisciplinary team of biologists, biochemists and engineers.

STT SYSTEMS
Software Engineer Intern

San Sebastián, Spain
July 2012

- Development of a communication module for 3D inertial sensors over bluetooth.

PUBLICATIONS

- ICLR 2019 Milad Alizadeh, **Javier Fernández-Marqués**, Nicholas D. Lane and Yarin Gal. *A Systematic Study of Binary Neural Networks' Optimisation*. International Conference on Learning Representations (ICLR), 2019
- EMDL 2018 **Javier Fernández-Marqués**, Vincent W.-S. Tseng, Sourav Bhattacharya and Nicholas D. Lane. *On-the-fly deterministic binary filters for memory efficient keyword spotting applications on embedded devices*. International Workshop on Embedded and Mobile Deep Learning (EMDL-MobiSys), 2018
- IJCAI 2018 Vincent W.-S. Tseng, Sourav Bhattacharya, **Javier Fernández-Marqués**, Milad Alizadeh, Catherine Tong and Nicholas D. Lane. *Deterministic Binary Filters for Convolutional Neural Networks*. International Joint Conference on Artificial Intelligence (IJCAI), 2018
- SysML 2018 **Javier Fernández-Marqués**, Vincent W.-S. Tseng, Sourav Bhattacharya and Nicholas D. Lane. *BinaryCmd: Keyword Spotting with deterministic binary basis*. SysML, 2018
- ICIP 2015 Marting Maška, Cristina Ederra, **Javier Fernández-Marqués**, Arrate Muñoz-Barrutia, Michal Kozubek and Carlos Ortiz-de-Solórzano. *Quantification of the 3D Collagen Network Geometry in Confocal Reflection Microscopy*. International Conference on Image Processing (ICIP), 2015

SOFTWARE SKILLS

- **Languages:** Python, C++, MATLAB
- **Frameworks:** Pytorch, Tensorflow, NumPy and CUDA (basics)
- **Other:** Docker, git, L^AT_EX, 3D Studio Max

AWARDS

- EPSRC DPhil (PhD) scholarship at the University of Oxford (2017-2021)
- Best undergraduate thesis for the quality of my research.
- Honoric Mention award at UNIV congress (Rome, 2012) for a 2D computer graphics project.
- Scholarship award from Spanish Government: Leadership academy in Canada (summer 2009)

OTHER ACTIVITIES

Secretary of the Spanish Society at the University of Oxford	2018-present
College's photographer and graphic designer	2010-2013