Jose M. Rivera-Rubio

Curriculum Vitae

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Education

2011 – Present **Ph.D. candidate in Bioengineering**, *Imperial College London*.
My thesis work is focused on the development of Computer Vision and Signal Processing algorithms for visual localisation and navigation. One of my motivations is to help the blind and partially sighted people to navigate.
I am currently designing vision models that extract distinctive information from mobile/wearable cameras video sequences to describe paths. In particular, I study ways of exploiting the spatio-temporal information from the sequences to provide indoor location.
Additionally, I have led a team that has built a database of grocery products for object recognition taking into account the particularities of the objects being hand held and the images acquired by sighted or blind users.

Supervisor: Dr Anil A. Bharath

2012 **International Computer Vision Summer School**, *University of Catania, Italy*.

2010 – 2011 **MSc Biomedical Engineering**, *Imperial College London*, Overall mark of 71% awarded the top mark (A) in 7/11 subjects.
Dissertation: Features for the visual biopsy of polyps
Awarded 'A' mark. The project was accomplished in collaboration with medical image processing company Medicsight and NHS expert colonoscopists.This thesis applied image processing, computer vision and machine learning techniques to endoscopic images, with the purpose of improving the characterisation and classification of large bowel polyps in real-time during colonoscopy. I improved the classification accuracy on two datasets by a 2 and 5% respectively (up to 86.44% and 94.64%) by adding four new features to the existing five. I also designed and implemented different approaches to narrow the margin of classification error by producing measurements of feature stability such as feature variability across the surface of polyps.

Supervisor: Dr Anil A. Bharath

2003 – 2009 **MEng Electrical and Electronic Engineering**, *University of Seville*, Spain, 1st class. Specialised in Computing, Signal Processing and Radiocommunications.
Dissertation: IP Multimedia Subsystem (IMS), the network convergence enabler
Awarded with 1st class with honours (10/10) in July 2009. Developed and tested IMS service deployment. Conducted a study of IMS future viability. Project accomplished whilst working within the Minerva Project. Built foundations for three scientific articles.

Supervisor: Dr Alejandro Carballar *Examiners:* Dr Antonio Estepa, Dr Rafael Bachiller

2009 **Mobile Communications Expert Course — Technologies and Mobile Applications: GPRS/UMTS**, University of Seville and Vodafone Spain Foundation, Researched on IP Multimedia Subsystem. Developed and simulated Java code for IMS service deployment on Ericsson SDS simulator.

1999 – 2003 **Secondary studies and Spanish Bachillerato**, IES Albero College, Physics, Chemistry, Maths, Biology, plus History, Spanish, English, French and Graphic design at the A2 equivalent level. Grade: 9.2/10.

Research Positions

October 2011 – Present **PhD student**, *Imperial College London*, PI: Dr Anil A. Bharath.

I am currently designing core algorithms for visual localisation based on crowdsourced paths. I have also built and benchmarked two novel datasets:

- The RSM dataset of "visual paths" for benchmarking visual localisation algorithms. It contains more than 1.8 km of video sequences captured with mobile and wearable devices along 6 indoor locations.
- A house-hold products dataset (the SHORT-100 dataset). SHORT-100 contains more than 150,000 images capturing usage particularities of blind and partially sighted people.

October 2008 – February 2010 **Research Assistant**, *The Minerva Project: Vodafone Spain, regional Government and University of Seville R&D project*, PI: Dr Alejandro Carballar.

This initiative funded my final year project. I researched on the IMS protocols and worked on R&D project monitoring and management. I was able to work in a multidisciplinary environment, studying the applications of my main research topic in other areas of interest such as Bioengineering or Social Services.

Publications

Peer reviewed conference papers

J. Rivera-Rubio, I. Alexiou, A. Bharath, R. Secoli, L. Dickens, and E. C. Lupu, "Associating locations from wearable cameras," in *British Machine Vision Conference (BMVC)*, (Nottingham, UK), 2014.

J. Rivera-Rubio, S. Idrees, I. Alexiou, L. Hadjilucas, and A. A. Bharath, "A dataset for hand-held object recognition," in *IEEE International Conference on Image Processing (ICIP)*, (Paris), 2014.

J. Rivera-Rubio, S. Idrees, I. Alexiou, L. Hadjilucas, and A. A. Bharath, "Small Hand-held Object Recognition Test (SHORT)," in *IEEE Winter Conference on Applications of Computer Vision (WACV)*, Steamboat Springs (CO, USA), 2014.

J. Rivera-Rubio, S. Idrees, I. Alexiou, L. Hadjilucas, and A. Bharath, "Mobile Visual Assistive Apps: Benchmarks of Vision Algorithm Performance," in *New Trends in Image Analysis and Processing – ICIAP 2013 SE - 4*, vol. 8158 of *Lecture Notes in Computer Science*, pp. 30–40, Springer Berlin Heidelberg, 2013.

J. Rivera-Rubio, A. Madera, and A. Carballar, "Incógnitas de IMS y claves para su lanzamiento," in *Telecom I+D*, (Madrid), 2009.

A. Madera, **J. Rivera-Rubio**, and A. Carballar, "DVB-H, realidad o ficción," in *Telecom I+D*, (Madrid), 2009.

Other Publications

J. Rivera-Rubio (translator), *The peculiar memories of Thomas Penman. By Bruce Robinson*. Barcelona: Cabaret Voltaire, 1 ed., 2010.

J. Rivera-Rubio, A. Madera, and A. Carballar, "Hacia el Todo-IP en movilidad," *BIT*, no. 179, pp. 59–62, 2010.

Experience

2014 **Summer Intern**, The MathWorks, Cambridge, UK.

Development/Application Engineering team. Developed MATLAB and Simulink models that interface with a variety of sensors and actuators connected to target hardware (Arduino and Raspberry Pi) using I2C as communication protocol and automatic C code generation for deployment on target hardware:

- Contributed the C code to interface the I2C Linux kernel tools allowing for code generation and deployed use on Raspberry Pi.
- Added MATLAB and Simulink support to 6 different sensors and actuators.
- Developed MATLAB OOP classes and examples for individual sensor/actuator operation.
- Created Simulink sensor and actuator integration models: 10-DOF inertial measurement unit (IMU) sensor fusion model with 3D visualization, pan and tilt unit using microservos.
- Developed prototypes of hardware camera stabilisation using microservos and IMU readings, and object tracking camera using object tracking algorithms and I2C microservos.

I also expanded two current examples from the Computer Vision toolbox providing a more robust object tracking technique and adding face tracking to the face recognition demo.

Teaching Experience

Teaching assistant – study groups

2011 – 2014 **Signals and Systems**, *BE2-HSAS*.

Students learn how to approach and solve signal processing problems. I led 3 study groups of 20 students each. Prepared and presented the background and material for each problem, encouraged the students to solve them and choose the best approach. I helped maintain student interest by providing a detailed step by step explanation of the problems.

Teaching assistant – lab demonstrator

2011 – 2013 **Signals and Systems**, *BE2-HSAS*.

2013 **Image Processing**, *BE3-HIPR*.

2012 **Statistics and Data Analysis**, *BE9-MSTDA*.

2011 **Programming II**, *BE2-HPROG2*.

Other Experience

March – July 2010 **IT Coordinator (Erasmus intern)**, *Auto ID Services Ltd.*, St. Helens, UK.

Internet and VoIP networks administration, mobile computing, IT security. Training and induction of new staff, documentation and IT strategy. Complete development of the new website.

Grants and Awards

2014 **Imperial College Trust**, *Conference funding*.

2014 **IEEE WACV conference travel grant**, *Funding for travel to Colorado, USA, to present at the 2014 IEEE WACV conference*.

2013 **V&L Net Pump-Priming 2013-1 Grant**, *EPSRC Network on Vision and Language (V&L Net)*, Riccardo Secoli and **Jose Rivera-Rubio**.

Funding for the BELVIS project to construct and release a database of "visual paths" containing images and videos of different journeys together with a voice record of the position to establish the ground truth. The release of this dataset will motivate research in the areas of mobile and visual localisation, voice-enabled ground truth and natural language processing of navigational information

2013 **Highly Commended Prize in the Poster Competition**, *Imperial College Graduate School Summer Research Symposium*, Awards given to the best 10 posters among more than 100.

2011 – 2014 **EPSRC PhD studentship**, *Imperial College London Department of Bioengineering*, Awarded one of three studentships among more than 120 candidates.

2011 **2011 International Grants**, *'La Caixa' Foundation: Welfare projects* , Selected for an interview on the 25th May 2011 to obtain a studentship for a PhD in Bioengineering Research at Imperial College. Shortlisted within the best 70 candidates among 19,000+ applicants to compete for 25 grants. Could not attend the interview due to Imperial College exam clash.

2010 **Erasmus Placement grant**, *European Union*, This studentship funded my placement at a UK company.

2007 – 2008 **SICUE/SENECA Scholarship**, *Spanish Education Ministry*, Scholarship and bursary to spend my MEng 5th and final year in Carlos III University of Madrid, Spanish top university in Computing.

2003 **Best performance award**, *Andalousian Regional Government*, Awarded with a best performance prize at college level and granted funding of first year tuition fees at university.

Computer skills

Advanced MATLAB, Linux (server and desktop), LaTeX, GIT, SVN, Office Suites (LibreOffice, Openoffice.org, MS Office), Microsoft Windows, Mac OS. Computer hardware and support,

Intermediate C,C++, JAVA, OpenCV,PYTHON, HTML, Inkscape,

Basic ROS, R, Gimp, Adobe Creative Suite.

Communication Skills

2013 **Oral presentation at the International Workshop on Assistive Computer Vision and Robotics**, *International Conference on Image Analysis and Processing (ICIAP)*, Naples, Italy.
Title of the talk: 'Mobile Visual Assistive Apps:Benchmarks of Vision Algorithm Performance ".

2013 **Oral presentation at the British Machine Vision Association**, London, UK.
Title of the talk: "Small Hand-held Object Recognition Test (SHORT)".

Languages

Spanish	**Mother tongue**	
English	**Full professional proficiency**	*TOEFL iBT 114/120*
French	**Intermediate proficiency**	*Completed 4 years at the Official School of Languages*
Chinese (Mandarin)	**Elementary proficiency**	*Completed 2 years of the language course at University (9/10)*
German	**Elementary proficiency**	*Completed 1 year of the language course at University (7/10)*

Interests

I have a passion for literature and enjoy every bit of it: from reading books to writing and translating. I have played the piano for 15 years and I have also taught myself to play the guitar. I feel that music and especially playing these instruments allows me to both relax and disconnect from my daily routine. I also love doing sports, like cycling and football, going to the cinema and watching a good TV series. One of my passions is travelling, which I would like to experience more and more with my family, friends, and to meet new people in every place.

References

References are available upon request.