

Jose M. Rivera-Rubio

Curriculum Vitae

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Research summary

My main research interests are in the fields of computer vision and pattern recognition. Particularly, I explore techniques that use biologically inspired algorithms to engineer solutions to a broad range of problems: from indoor localization to object recognition.

Education

- 2011 – **Ph.D. candidate in Bioengineering, Imperial College London.**
- Present My thesis work is focused on the development of Computer Vision and Pattern Recognition algorithms for appearance-based visual localisation. Particularly, I'm interested in biologically inspired methods that can also work in other fields such as object recognition.
Additionally, I have extensive experience in developing benchmarks for appearance-based methods. I have contributed the benchmark pipeline code and novel datasets for hand-held object recognition (<http://short.bicv.org>) and visual localization from wearable cameras (<http://rsm.bicv.org>).
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
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
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 Albergo College, Physics, Chemistry, Maths, Biology, plus History, Spanish, English, French and Graphic design at the A2 equivalent level. Grade: 9.2/10.

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 microsensors.
- Developed prototypes of hardware camera stabilisation using microsensors and IMU readings, and object tracking camera using object tracking algorithms and I2C microsensors.

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.

Research Positions

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

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

– February

2010 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.

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**, *Andalusian 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 & SIMULINK, Linux (server and desktop), L^AT_EX, 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 **Elementary proficiency** *Completed 2 years of the language course at University (9/10)*
(Mandarin)
- 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.