



Oscar Mendez

Curriculum Vitae

Researcher in Robotics, Computer Vision and Deep Learning.

Research Interests

Profile I am interested in the fields of Robotics, Computer Vision and Deep Learning. I've spent many years developing and building real-time robotic systems that can leverage the advances of Deep Learning to perform difficult computer vision tasks such as 3D Reconstruction and Multi-View Geometry. I am also interested in collaboration and automation between robotic agents, specifically emergent behaviours that are not hard-coded into systems.

Topics *Autonomous Agents, Collaborative Robotics, 3D Reconstruction, Multi-View Geometry, SLAM, Semantic Segmentation, High-Level Understanding*

Research Skills

Reviewer Various international conferences including
British Machine Vision Conference (BMVC)
IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)

Languages C++, PYTHON, MATLAB, JAVA, CUDA, L^AT_EX

Libraries Robot Operating System (ROS), Point Cloud Library (PCL), Caffe, OpenCV, OpenMP, Mobile Robot Programming Toolkit (MRPT), Open Motion Planning Library (OMPL), MoveIt!

Miscellaneous Robot Hardware Design, Baxter Robot, Networking Devices and Protocols

Communication Skills

- 2017 **Robotics Research Presenter**, *EPSRC Visit to CVSSP*, University of Surrey.
- 2017 **Demonstration Developer**, *Festival of Wonder*, University of Surrey, ~3000 Attendees.
- 2016–2017 **RobotLab Presenter**, *Applicant Day*, University of Surrey, ~18 Attendees per visit.
- 2016 **Oral Presenter**, *British Machine Vision Conference*, University of York, ~300 Attendees.
- 2016 **CVSSP Presenter**, *Evening on Space Robotics*, University of Surrey, ~300 Attendees.
- 2015 **Seminar Presenter**, *SMSAS PGR Seminar*, University of Kent, ~30 Attendees.
- 2014 **Poster Presenter**, *PGR Conference*, University of Surrey, ~200 Attendees.

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Education

- 2013–2017 **PhD. Robotics and Computer Vision**, UNIVERSITY OF SURREY, Guildford, *Candidate*.
Completed at Centre for Vision and Signal Processing (CVSSP), it focused on autonomous exploration by collaborative agents using monocular sensors. I explored the topics of Deep Learning, Pathplanning, SLAM, Multi-View Geometry and Collaborative Strategies.
- 2009–2013 **BEng. (Hons) Electronic and Computer Engineering**, UNIVERSITY OF SURREY, Guildford, *First Class*.
Modules Included Digital Signal Processing, Object Oriented Design and C++, Parallel Architectures, Data & Internet Networking, Control Systems, Computer Graphics, Eng. Mathematics, Circuit Theory, Digital Electronics.

PhD Thesis

- Title *Collaborative Strategies for Multi-Agent 3D Reconstruction and Localisation*
- Supervisors Professor Richard Bowden & Doctor Simon Hadfield & Doctor Nicolas Pugeault
- Description This thesis explored methods for autonomous, collaborative multi-agent reconstruction. Strategies for multi-view reconstruction were developed, along with multiple robots, path-planning and localisation techniques.

BEng Thesis

- Title *Quantum Tunnelling and Band-Gap Calculations of 1-D Nanostructures*
- Supervisor Dr. David Carey
- Description This thesis explored techniques to create a model of material properties via quantum tunnelling calculations. The model was then applied to crystal lattices and used to represent the band-gap structure of materials.

Research Experience

- 2016–2017 **Project Snowblading, VR, SLAM and Autonomous Exploration**, University of Surrey.
In collaboration with the University of Dundee (Under NDA).

Teaching Experience

- 2015–2017 **Co-Supervisor**, UNDERGRADUATE THESIS, University of Surrey.
I have co-supervised several students during my PhD. Topics included Virtual Reality, Robotic Interaction and Robotic Grasping.
- 2015–2016 **Programming Labs Demonstrator**, EEE3013 OBJECT ORIENTED DESIGN AND C++, University of Surrey.
Four hours a week in C++ and Object Oriented Design labs where I had hands-on experience teaching undergraduate students.
- 2015 **Programming Labs Demonstrator**, COM1025 WEB PUBLISHING AND DATABASES, University of Surrey.
Two hours a week, where I had hands on experience teaching undergraduate students the basics of website development and database management.
- 2014–2016 **Programming Labs Demonstrator**, EEE1030 COMPUTERS AND PROGRAMMING, University of Surrey.
Four hours a week teaching undergraduate students basic programming skills and the C language.
- 2014 **Electronic Labs Demonstrator**, EEE2037 LDPS IV, University of Surrey.
Eight hours a week in hardware-based labs, teaching undergraduates circuit design and embedded programming on a face-to-face basis.

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Professional Experience

- 2011–2012 **Interim Engineering Intern**, QUALCOMM LTD., Farnborough, Hampshire.
I interned for the GERAN Systems Team at Qualcomm. My responsibilities included the VAMOS project, where I ran and scheduled performance tests, helped with debugging and testing and supported other teams with their efforts. I also helped the Firmware team develop a virtual platform for debugging.
- 2009 **System Administrator**, TPS ARMORING, Monterrey, Mexico.
During the summer of 2009 I worked as a system administrator at a company dedicated to making bulletproof cars. My roles included server maintenance, SQL database management, use and administration of Microsoft Dynamics SL as well as Active Directory Management on Windows Servers.

Awards

- 2016 **BMVC Student Bursary**, *British Machine Vision Conference (BMVC)*, £515.
2009–2013 **International Student Scholarship**, *University of Surrey*, £1500 p.a.

Society Membership

- 2014–Pres Member of British Machine Vision Association (BMVA)
2012–Pres Member of Institute of Engineering and Technology (IET)
2017–Pres Member of Institute for Electrical and Electronics Engineers (IEEE)

Languages

- Spanish **Mother tongue**
English **Fully Fluent** *Native-Level Speaker*

Personal Interests

- PC Building
- Bass Playing
- Cooking
- Camping
- Basketball
- Weightlifting

List of Publications

- 2016 **Next-Best Stereo: Extending Next Best View Optimisation for Collaborative Sensors.**
(**Oscar Mendez**, Simon Hadfield, Nicolas Pugeault, Richard Bowden), In Proceedings of the British Conference on Machine Vision (BMVC), BMVA Press, 2016. **(Oral)**
- 2017 **Taking the Scenic Route to 3D: Optimising Reconstruction from Moving Cameras.**
(**Oscar Mendez**, Simon Hadfield, Nicolas Pugeault, Richard Bowden), In Proceedings of the International Conference on Computer Vision (ICCV), IEEE, 2017. **(Under Review, 2 Weak Accepts, 1 Borderline)**
- 2017 **Semantic Detection and Ranging: Humans Can Localise without LiDAR, can Robots?.**
(**Oscar Mendez**, Simon Hadfield, Nicolas Pugeault, Richard Bowden), **TBA**, 2017.