Pedro Vallejo Ramirez

ppv23@cam.ac.uk• +44.7732.858846• Robinson College, Cambridge, CB3 9AN

Education and Honors

University of Cambridge   **Cambridge, United Kingdom**
PhD in Biotechnology   *Expected June 2020*
- Gates Scholarship
- Yates-Unilever Scholarship, Robinson College (awarded 2016, renewed 2017 and 2018).

University of Rochester   **Rochester, New York, USA**
B.S. Optical Engineering, Cumulative GPA 3.97/4.00   *May 2016*
- As *Renaissance and Global Scholarship Recipient* awarded full-tuition scholarship for undergraduate tenure at the University.
- As *Research and Innovation Grant Recipient* earned grant to be allocated for supervised undergraduate research.
- As *Dean's Choice Award Recipient* earned a medal in the university's 2014 Undergraduate Research Exposition.
- Competed and won awards in four major business competitions: *1st place Simon Business School Early Leaders Case Competition, 1st place in Rochester Regional Business Plan Contest, 2nd Place in NY Business Plan Competition, 1st place in Excell Pre-Seed workshop*.
- One of five *2015 Tau Beta Pi Laureates* for gifted engineering students who have excelled in areas beyond their technical majors.

Technical Projects and Presentations

OptiJ: Open source optical projection tomography system for large organ samples   *Oct 2016-Present*
- Worked with a team to build and characterise a low-cost, open-source Optical Projection Tomography system capable of imaging large transparent specimens up to 13 mm tall and 8 mm deep with 50 µm resolution.

A super-resolution method to study the endogenous role of alpha-synuclein in synaptic signalling.   *Jan 2018-Present*
- Developed a software package to automatically detect synapses in super-resolution imaging, corrected for artifacts arising from chromatic aberrations and high densities of fluorescent emitters, and applied coordinate-based colocalization methods to quantify spatial relationships between protein distributions at the synapse.

Pathogen Detection Device using Brewster's Angle Straddled Interferometry (BASI)   *October 2015 - May 2016*
- Designed, built, and tested a prototype for a low-cost, portable interferometer to detect pathogens in a biological sample. Potential uses include plant pathogen testing (diseases affecting crops), point of care diagnostics, food safety, and environmental monitoring.

Design of a Wide-Angle Lens for Cave Photography   *January-May 2015*
- CodeV design of an 84-degree full field of view, F/1.4 rectilinear wide-angle camera lens with to capture large scenes with minimal illumination in underground caves. The design was toleranced and evaluated for manufacturability, overcoming constraints in relative illumination, MTF across the field of view, and different configurations for F/number and zoom.

Teaching and Mentoring

The Cambridge Prep Experience, Oxbridge Academic Programs   **Cambridge, UK**
Faculty member   *July-August 2017, 2018, 2019*
- Taught intensive summer course on "Science and the Future" for 14-15-year-old students from the Americas, Europe, and China. Topics covered included genetic engineering, machine learning, climate change, and renewable energies.

Department of Chemical Engineering and Biotechnology, Cambridge University   **Cambridge, UK**
Advanced Optical Microscopy Supervisor   *January-June 2018, November 2019*
- Supervised course on physical optics and modern microscopy techniques for master's degree and final year undergraduate students.

University of Rochester   **Rochester,NY**
Social Chair, President, Senior Advisor, Optical Society of America student chapter   *2013,2014,2015,2016 (respectively)*

Technical and Project Management Experience

Edmund Optics.   **Barrington, NJ, USA**
Engineering Intern, Imaging Business Unit   *June –August 2015*
- Completed research project on extended depth of field (EDOF) technologies for machine vision and life sciences applications, focusing on light field. Provided an engineering assessment to the company on the viability of using certain EDOF technologies for their machine vision applications.

FiveFocal LLC.   **Boulder, Colorado, USA**
Junior Optical Engineer   *May –August 2014*
- Developed a ray tracing model for a diffractive optic for the firm's proprietary design software using Python.
- Produced comparable results from the ray tracing model to industry standards from Zemax, CodeV, and Oslo.

Ovitz Co.   **Rochester, New York, USA**
Co-founder, Marketing and Relations Officer   *June 2013 –August 2014*
- Assisted in designing, developing, and prototyping a portable auto refractor. Helped established the mission and vision in the startup phase of the company. Developed business plans and delivered pitches for three major business competitions.

Language and Technical Skills

- MATLAB®, R, Java, and Python programming skills, especially in image processing and analysis. Ray tracing experience with Zemax, CodeV, and Oslo.
- Fluent in Spanish, English, and French; Conversational in Italian and Portuguese; Beginner skills in German.

Publication List

Vallejo Ramirez, Pedro P; Stephens, Amberley; Bruggeman, Ezra; Rees, Eric J.; Kaminski, Clemens F.; Kaminski Schierle, Gabriele S.; Multi-colour dSTORM and coordinate-based colocalization analysis to investigate how alpha synuclein mediates calcium-dependent endo and exocytosis. (Submission in progress)

Vallejo Ramirez, P.P., Zammit, J., Vanderpoorten, O. *et al.* OptiJ: Open-source optical projection tomography of large organ samples. *Sci Rep* **9,** 15693 (2019) doi:10.1038/s41598-019-52065-0

Rowlands, C. J., Ströhl, F., Ramirez, P. P. V., Scherer, K. M., & Kaminski, C. F. (2018). Flat-Field Super-Resolution Localization Microscopy with a Low-Cost Refractive Beam-Shaping Element. Scientific Reports, 8(1), 5630. https://doi.org/10.1038/s41598-018-24052-4

Chinni, B., Dogra, V., Han, Z., Rao, N., Vallejo, P., Knox, W.,Bentley, J., Wood, R. (2015). Fabrication of a novel C-scan photoacoustic imaging camera. *IEEE Biomedical Circuits and Systems Conference: Engineering for Healthy Minds and Able Bodies, BioCAS 2015 - Proceedings*, (i), 0–3. https://doi.org/10.1109/BioCAS.2015.7348455