Pedro Vallejo Ramirez

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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).

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 monetary award to be allocated for independent or supervised research.
- As *Dean's Choice Award Recipient* earned a medal in the university's 2014 Undergraduate Research Exposition.
- *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*
- Characterized and tested an Optical Projection Tomography system built using off-the-shelf components and operated using open-source software (OptiJ). Dissected, perfused, and cleared adult murine lungs with alveolar cell immunostaining were imaged and reconstructed using OptiJ to visualize the airway tree in 3D non-destructively. Publication submission in progress.

Multi-color super-resolution microscopy and coordinate-based colocalization analysis to investigate how alpha synuclein mediates calcium-dependent endo and exocytosis. *Jan 2018-Present*
- Multi-color single-molecule localization microscopy to visualize the relationship between alpha-synuclein and vesicles that have been trafficked (endo or exocytosed) under physiological and calcium-depleted conditions in synaptosomes, which are pinched-off nerve terminals from rat brain homogenates.

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 included 16 configurations for different f-numbers and object distances.

Teaching and Mentoring

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

Department of Chemical Engineering and Biotechnology, Cambridge University **Cambridge, UK**
Advanced Optical Microscopy Supervisor *January-June 2018*
- 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)*
Workshop Leader, Geometrical Optics Course *Fall 2014*
Community Advisor, Resident Advisor for Residential Life *Fall 2013-Spring 2016*

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 technologies for machine vision and life sciences applications. Presented a review on the science behind the technologies, an assessment of the major players in the industry, and their market potential.

FiveFocal LLC. **Boulder, Colorado, USA**
Junior Optical Engineer *May –August 2014*
- Worked in developing ray-tracing software for Optical Design of end-to-end systems.

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®, Java, and Python programming skills, especially image processing. Ray tracing experience with Zemax and CodeV.

- 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, Pedro P; Zammitt, Joseph; Vanderpoorten, Oliver; Ble, Francois-Xavier; Zhou, Xiao-Hong et. al. OptiJ: Open Source Optical Projection Tomography for large organ samples. (Submission in progress) http://bit.ly/LAG-OptiJ

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