Cristian Rendón

France | crendoc11@gmail.com | Web Site | Linked In | crendo11

About Me

Currently concluding a PhD in Computer Science at Université Paris-Saclay, focusing on the development of state-of-the-art optical systems to enhance human vision. Now in the final stage of my doctoral research, I have integrated expertise in spatial light modulators, free-form optics, and adaptive optics, with simulations conducted in Code V and hardware prototyping using high precision lenses, 3D printing and Onshape CAD. My collaborative efforts span computer graphics, optometry, and optics, reflecting a multidisciplinary approach.

Skills

Optical Design	Free-form Optics, Diffractive Optics	**Coding**	Python, Matlab, OpenCV, JavaScript
Optical Testing	Alignment, Calibration, MTF	**CAD**	Onshape, FreeCAD, Blender
Optical Simulation	Code V, Fourier Optics	**Languages**	English, Spanish, French

Experience

PhD in Computer Science — *Orsay, FR*
Augmented Reality & Artificial Intelligence (ARAI) Team, *Paris-Saclay University* — *Oct 2022 – Nov 2025*

- Implemented an interdisciplinary solution that combines image processing, optical design, optimisation, and prototyping for the thesis "Enhancing Human Performance through Augmented Vision."
- Validated optical design through Code V simulations.
- Built a prototype that integrated Spatial Light Modulators (SLMs) and free-form optics.
- Conducted optical alignment and calibration experiments with lasers and precision mounts, ensuring system stability and repeatability.
- Quantified and optimised the system imaging performance through aberration analysis and MTF measurements.
- Collaborated with experts in computer graphics, optometry, and optics to build an interdisciplinary solution.

PhD Visitor — *Tokyo, JP*
User Interface Research Group, *The University of Tokyo* — *May 2025 – July 2025*

- Developed a shader for selective blurring of objects in VR.
- Led optical system experimental validation using VR simulations.

Consultant Software Engineer — *Medellin, CO*
Cohesive Manufacturing — *Apr 2021 – Sep 2022*

- Led the development of computational geometry tools using JavaScript, Node.js, and Angular for the company's 3D viewer.
- Built an OpenCV pipeline for automated background removal of e-commerce images.
- Key contributor to the company's 3D viewer, creating a reusable Angular library for seamless project integration.
- Developed navigation experiences for the web-based 3D viewer.

Researcher — *Medellin, CO*
CAD CAM CAE Laboratory, *EAFIT University* — *July 2017 – Sept 2022*

- Conducted research in Computational Geometry, Mechanics, Fluid Dynamics, and Dynamic Systems.
- Worked on projects optimising wing profiles for maximum lift using CFD simulations.
- Used Matlab, JavaScript, Ansys, and LaTeX for simulations and article writing.
- Research and Development in partnership with Cohesive Manufacturing.

Researcher — *Melbourne, AU*
Walter Bassett Aerodynamics Laboratory, *The University of Melbourne* — *Jan 2019 – July 2019*

- Developed expertise in signal processing and image analysis for hot-wire and hot-film anemometry and Particle Image Analysis (PIV).
- Gained expertise in feature extraction and tracking in noisy flow data.

Education

Université Paris-Saclay — *Oct 2022 – Nov 2025*
PhD in Computer Science

Universidad EAFIT — *Sept 2015 – Sept 2022*
MSc in Engineering
BSc in Mechanical Engineering. ***Minor:*** *Computational Mechanics*

Publications

- Cristian Rendon-Cardona, Marie-Anne Burcklen, Richard Legras, Christian Sandor, Augmented Vision Systems: Paradigms and Applications. *IEEE Transactions on Visualization and Computer Graphics,* 31(10): 9484-9501, July 2025. DOI: 10.1109/TVCG.2025.3587527
- Cristian Rendon-Cardona, Jorge Correa, Diego A. Acosta, Oscar Ruiz-Salguero. Analytic Form Fitting in Poor Triangular Meshes. *Algorithms,* 14(11): 304-331, October 2021. DOI: 10.3390/a14110304
- Cristian Rendon-Cardona, Zhoushun Ruan, Oscar Ruiz-Salguero. Skin-friction Measurements in Turbulent Boundary Layers. *International Journal of Engineering and Technology,* 12(1): 1-15, February 2020. DOI:10.3390/a14110304
- Cristian C. Rendon, José Hernandez, Oscar Ruiz-Salguero, Carlos A. Alvarez, Mauricio Toro. Wing profile evolution driven by computational fluid dynamics. *UIS Ingenierías*, 18(2): 139-149, January 2019. DOI: 10.18273/revuin.v18n2-2019013