Julian SIERRA VELEZ

PhD researcher - Nanophotonics and ML techniques

Hi! I'm Julian, a PhD researcher currently residing in France. I am working at the Université de Technologie de Troyes on the modeling of biomimetic photonic structures using Symbolic Regression.

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Core business

PHASE 3 **Skill development**

During my PhD, I critically evaluated my skills, setting ambitious yet realistic goals in designing biomimetic photonic structures using Symbolic Regression. I enhanced employability by attending international conferences doing scintific communication and networking, publishing research, and learning new programming languages. Mentorship from my supervisors and international collaborations with researchers expanded my expertise. My international experiences in France and Germany highlight my mobility and adaptability.

PHASE 3 **Evaluation**

Teaching practical work during my PhD allowed me to critically evaluate educational materials and adapt them for student comprehension. I assessed the quality and impact of my teaching through student feedback and performance. Presenting complex ideas to a critical student audience honed my communication skills and openness to feedback. I evaluated student projects, providing constructive and realistic assessments. Encouraging students to engage in self-evaluation and peer review fostered a collaborative learning environment. This experience enhanced my ability to manage and guide evaluation processes effectively.

PHASE 3 **Information management**

During my PhD, I conducted comprehensive literature reviews to establish the state of the art in the modeling techniques for turbid media, and for biomimetic photonic structures, utilizing bibliographic databases and the help of AI search engines.

PHASE 3 **Expertise and methods**

Throughout my PhD, I mastered core concepts in turbid media modeling and biomimetic photonic structures. I framed my work in an international context, justifying my use of Symbolic Regression and exploring the difference modeling methods. I collaborated with experts across disciplines, adopting new research techniques.

Personal and relational qualities

PHASE 3 **Communication**

During my PhD, I effectively communicated my research at national and international conferences, such as the MNO conference in France (where I won the best poster award), and the NBC Conference in Latvia. Presenting to diverse audiences honed my ability to tailor my language and arguments. I published a conference paper and am preparing an article for publication. I mastered various communication techniques and digital tools, ensuring my online presence reflects my professional identity. Engaging with experts across fields, I fostered interdisciplinary dialogue and knowledge dissemination, enhancing our collective understanding.

PHASE 3 **Collaboration**

During my PhD, I developed and maintained cooperation networks through two ongoing international collaborations. I worked with researchers at the University of Buenos Aires on the optical response of biological structures and with a researcher from the Karlsruhe Institute of Technology on biomimetic and bio-inspired structures. These partnerships allowed me to co-produce innovative results, navigate common and conflicting interests, and enhance interdisciplinary collaboration. Engaging with key international teams, I contributed to knowledge exchange and network building across diverse structures.

Business management and value creation

PHASE 3 **Managing change**

Initially, my PhD project aimed for a multiphysical characterization of biomimetic photonic structures. However, due to the complexity of modeling turbid media, we adapted our approach to focus solely on optical characterization. This strategic decision allowed us to achieve meaningful results. We discussed alongside my supervisors, and we set a new plan. This experience underscored my ability to adapt project plans and promote organizational change.

Strategy and Leadership

PHASE 3 **Strategy**

Throughout my PhD, I aligned my research on biomimetic photonic structures with the strategic goals of advancing sustainable and innovative optical technologies. I identified key supporters, including international collaborators and supervisors, to bolster my project. Observing industry trends, I adapted my approach, focusing on the optical characterization of materials. I contributed to strategic discussions and produced documents highlighting the prospective impact of my research.

PHASE 3 **Leadership**

During my PhD, I developed tools to work independently, being proactive and effectively managing my time and tasks. Leading my research project on biomimetic photonic structures, I convinced peers and collaborators of its value, mobilizing expertise without direct authority. I built alliances based on trust, fostering a collaborative environment. Recognizing the importance of collegiality, I adapted my leadership style to suit team dynamics. My proactive approach and ability to guide projects have been acknowledged within my research community, contributing to successful outcomes