PhD POSITION AVAILABLE
Département Optique Institut FEMTO-ST, Université Bourgogne Franche-Comté
Ecole Doctorale SPIM Spécialité : Optics & Photonics
Supervisor/Directeur de thèse : John DUDLEY

Machine learning optimization and control of ultrafast lasers and applications

Machine learning is a field of artificial intelligence that applies advanced techniques from statistics and numerical analysis to perform tasks without explicit programmed instructions. Recent years have seen dramatic impact of machine learning in society, with applications in health-care, autonomous vehicles, and language processing. The objective of this thesis is to apply techniques of machine learning to develop customized and programmable ultrafast lasers, and to develop deep learning (neural network) approaches to both aid in the design of the sources themselves, as well as to optimize the generation and propagation of these pulses in optical fibre.

Profile of the Candidate

Typical applicants will have a strong background in physics, electrical engineering, or engineering science, with previous training in optoelectronics, optics, and laser physics. The project is primarily experimental, and experience of optical fiber manipulation and handling would be an advantage. In all cases, applicants must have excellent computer skills with experience in MATLAB or Python (and ideally GPU Programming). Experience with interfacing to laboratory equipment will also be an asset, but the main requirement is a passion and desire to learn advanced techniques at the state of the art of artificial intelligence applied to one of the most exciting fields of research in optics.

Contract Details

36 months starting from October 2021. The salary is fixed by French regulations at around 1900 €/month before tax. Funding is from the Agence Nationale de Recherche (ANR) Project OPTIMAL which involves collaboration with partners at the ICB (Dijon) and XLIM (Limoges) laboratories in France.

Work Environment

FEMTO-ST is one of France's leading research centers in engineering science and photonics, and combines permanent staff from the CNRS and Université Bourgogne Franche-Comté in an exciting multidisciplinary environment. Besançon is a picturesque town dating back to Roman times containing a UNESCO World Heritage Site, many cultural attractions, and easy access to outdoor pursuits.

Contact Information

Please contact Professor John Dudley john.dudley@univ-fcomte.fr Applications need to include: transcripts of Masters Diplomas, including all course marks from both 1st and 2nd Year; a letter(s) of reference from your Masters project supervisor(s); if possible a statement of ranking in your class; evidence of competence in English or French. Deadline for Applications. 1/06/2021