



# PhD position on Explainable ML in Health Science

Keywords: Scattering Transforms, Convolutional Neural Networks, Health Sciences

Profile: M.Sc. Computer Science/Mathematics/Physics or a related field

Institute: IHU Strasbourg/University of Strasbourg

Location: Strasbourg, France

Supervisor: Dr Georgios Exarchakis

We offer a PhD position attached to the [CAMA team](#) at IHU Strasbourg/University of Strasbourg for a motivated student interested in contributing to the development of Machine Learning algorithms for use in Health Sciences. The Institute provides a multi-disciplinary environment where clinicians collaborate with engineers to provide real-world surgical solutions.

The PhD position focuses on explainable approaches to AI with applications to Health Science. We consider approaches with foundations in signal processing and machine learning, such as the Wavelet Scattering Transforms[1,2] and Deep Convolutional Neural Networks. However, the candidate is expected to introduce novel model architectures for applications on disease diagnosis from CT and MRI scans. The goal of the project is to produce accurate predictive algorithms with performance guarantees that can be established analytically.

An ideal applicant will have a strong background in mathematics or physics preferably with a specialisation in machine learning, and signal processing. Strong analytical skills will be required for the successful participation in the project. Familiarity with Machine Learning libraries and The project also requires the ability to develop Convolutional Neural Networks in the Python programming language with at least one of the popular ML libraries, e.g. Pytorch, TensorFlow. Proficiency in spoken and written English is mandatory.

Contact [Dr Georgios Exarchakis](#) at [georgios.exarchakis@ihu-strasbourg.eu](mailto:georgios.exarchakis@ihu-strasbourg.eu) for applications and further inquiries. An application should include a one page motivation for letter, a CV, copies of earlier degrees and transcripts. To facilitate processing of applications please use the title "PhD on Explainable AI".

[1] Eickenberg M., Exarchakis G., Hirn M., Mallat S., Thiry L. (2018). *Solid harmonic wavelet scattering for predictions of molecule properties*. The Journal of chemical physics, 2018.

[2] Andreux M., Angles T., Exarchakis G., Leonarduzzi R., Rochette G., Thiry L., Zarka J., Mallat S., Andén J., Belilovsky E., Bruna J., Lostanlen V., Chaudhary M., Hirn M. J., Oyallon E., Zhang S., Cella C., Eickenberg M. (2020). *Kymatio: Scattering Transforms in Python*. Journal of Machine Learning Research, 2020.