Phd Thesis at Inria
on
"AI-based Real-time Diagnosis of abdominal organs from Ultrasound Imaging"

Context : Ultrasound imaging can be used anywhere the patient needs care, making it the most mobile imaging tool available. It is also the only technique that is both mobile, non ionizing, real time and affordable, making it the obvious candidate to fulfill the need for the two-third of the world population who don't have access to medical imaging. More than 20 medical and surgical specialties start to use the technique as part of their care. It has become in France the first imaging technique with more than 30 million exams each year in the liberal sector only. However, the interpretation of ultrasound images remains difficult and is currently the bottleneck in the diffusion of ultrasound imaging in the world. The NHance project launched within the Paris Hospitals (APHP), backed with the NHance NGO, aims at providing an interpretation assistance to practioners with an AI-based solution.

Phd Topics : The goal of the thesis is to develop AI and **machine learning methods** for the automatic detection of abdominal organs from time series of ultrasound imaging and the automatic detection and diagnosis of pathologies. This work will be based on an exceptionally large annotated image database acquired at the Paris Hospitals and gathered by the EDS (Entrepôt des données de santé). The objective is to perform the medical interpretation of abdominal ultrasound images in real-time in order to provide the user with clear explanations of the AI-based diagnosis.

Localisation : This thesis will take place within the Epione team at Inria Sophia Antipolis in strong collaboration with the Paris Hospitals.

Required Competences

- Master degree with strong competences in statistical learning and mathematical modeling, as well as knowledge in medical imaging, signal and image processing (Master 2 level).
- Engineer degree (Grandes Ecoles) is an asset.
- Solid programming and IT skills are necessary (Python and C++, bash scripting, version control systems).
- Strong communication abilities
- Fluent English (written and spoken)

Contact Persons:

Please send a resume and motivation letter at the following persons :

Hervé Delingette (Inria), Anne-Laure Rousseau (APHP), Nicholas Ayache (Inria).