Deep learning based Organ Measurement in Fetal Ultrasound

Duration: 6 months
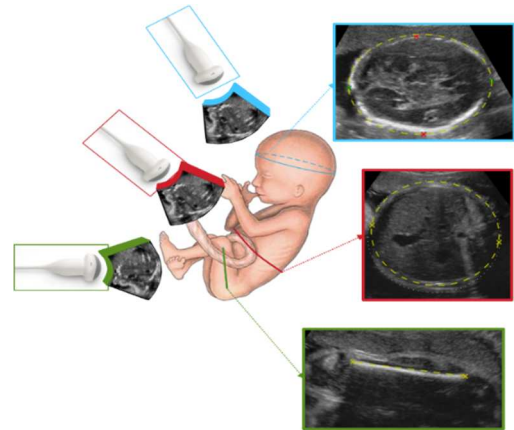**Preferred start date:** from March 2019 or later
Localization: Suresnes (92)
Contact: caroline.raynaud@philips.com
                  hernan.morales@philips.com
Supervisor: Cybele Ciofolo-Veit

Host entity

Philips is a world leader in medical imaging. Its products cover the full range of imaging modalities: X-Rays, MRI, Ultrasound, CT, etc. The company is internationally recognized for the excellence of its technology, developed within innovative research groups.

*Philips Research Paris - Medisys i*s based in Suresnes (92) and is dedicated to medical image processing. The team, with about thirty researchers and engineers, is focused on delivering the most innovative solutions in the domain and is in close contact with famous universities and clinical sites in France and abroad.

Internship description

Ultrasound (US) imaging is the modality of choice for fetal screening. In many countries, the US exam performed between 18 and 22 weeks of pregnancy is used to assess the development of the fetus by measuring its head, abdomen and femur. In this internship, we propose to use deep learning approaches to perform such measurements and compare the results with existing image processing methods and manual measurements.

A first step will be to increase the robustness of existing methods by using artificial intelligence techniques. The second step will consist in implementing deep learning approaches to delineate the organs of interest and perform the measurements.

A database of US images with associated measurements is available to train and test the algorithms. Existing approaches, which do not involve deep learning, have already been evaluated and will be used as a baseline for comparison. The programming language is Python.

Candidate profile

- Third year of engineer school / Master 2 Recherche, with specialty in machine learning, image processing or applied mathematics
- Solid knowledge of statistics, machine learning, deep learning, image processing
- Experience in Matlab and/or Python
- English speaking, reading and writing is mandatory
- Good communication skills and ability to work in a team