

Deep Learning for 3D Ultrasound Data Segmentation

PROJECT DESCRIPTION

"Segmenting 3D ultrasound data is challenging due to high levels of noise. The goal of this project is to design a method for segmenting the femoral head in 3D ultrasound data, an important task for both diagnosing and treatment progression of developmental dysplasia of the hip (DDH) in infants.

Often, traditional medical image segmentation methods use cues and priors like image appearance, edges or shapes to guide segmentation. Recently, deep learning and, in particular, convolutional neural networks (CNNs) had great success in natural image segmentation. Their direct application to medical data is still challenging due to data size, difficulty in getting lots of ground truth from medical doctors. The project will investigate ways of incorporating prior information like shape into deep architectures to overcome some of these limitations.

Links and references:

<http://webdocs.cs.ualberta.ca/~vis/research.htm#MI>

CNN in medical imaging : deepMed <https://github.com/Kamnitsask/deepmedic>

FCN in medical imaging : UNet <https://lmb.informatik.uni-freiburg.de/people/ronneber/u-net/>

FACULTY-DEPARTMENT

Science - Computing Science

DESIRED FIELD OF (STUDENT) STUDY

Computer Science and Engineering, Mathematics

The ideal candidate has a background and interest in medical image analysis and computer vision. Good mathematical background is also expected.

INTERNSHIP LOCATION

University of Alberta Main Campus - Edmonton

NUMBER OF INTERNSHIP POSITIONS

1

Contact: Brendan Cavanagh, Internship Coordinator (Inbound)
University of Alberta International
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INTERNSHIP START DATE

May-June

INTERNSHIP END DATE

July-August

ARE THE DATES FLEXIBLE?

Yes, I am flexible regarding the internship dates. Selected students can contact me to request a date change.