



acoustic insight

OPTIMIZING OCT SIGNAL PROCESSING

Acoustic Insight is a Dutch MedTech start-up developing an innovative imaging platform for ear specialists. We're based in the inspiring start-up environment of YES!Delft.

**Do you have a special interest in medical optics and signal processing?
As a student you can make a real contribution to improving ear care.
Just join our team!**

Every year, 200.000 patients in the Netherlands visit an ear specialist with middle ear problems. Ear specialists often miss relevant information to understand why the middle ear doesn't work properly simply because they can't see the relevant structures behind the ear drum. Acoustic Insight develops Aurisvue, a new medical device based on **optical coherence tomography (OCT)** that cannot only visualize these structures but also measure the mobility of the hearing bones. With Aurisvue, medical professionals can provide the best ear care and improve the quality of life of patients with middle ear problems. The first clinical investigation is planned to start in summer 2022 at the Erasmus MC in Rotterdam.

The project

OCT provides depth-resolved imaging of semi-transparent tissue. It is an interferometric method with very high sensitivity and resolution, but requires careful implementation of various complex steps to transform the raw, acquired signal to image data (see Figure 1). Different approaches for each step are described in the literature but they need to be evaluated for the specific characteristics of Aurisvue and its application on middle ear imaging. In this project, you analyze, describe and implement the various steps in preprocessing of the OCT data produced by Aurisvue (see Figure 2). Processing steps to optimize include k-space optimization, dispersion compensation, windowing, fixed-pattern noise removal and scan correction. Data to be used comes both from test targets and from clinical data from patients with different middle ear pathologies.

We are looking for enthusiastic and motivated BSc/MSc students that have:

- an interest in optics and signal processing;
- some programming experience (preferably Python); and
- a strong interest in medical applications.

At Acoustic Insight, we value initiative and look forward to adapt the project to your specific interests and knowledge. Contact us for more information!

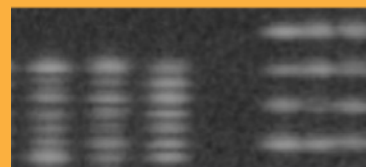
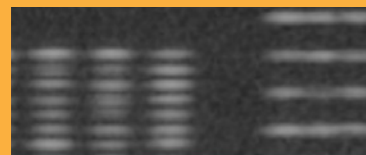


Figure 1: OCT image of test target. (top)
All corrections enabled. (bottom)
Dispersion compensation disabled.

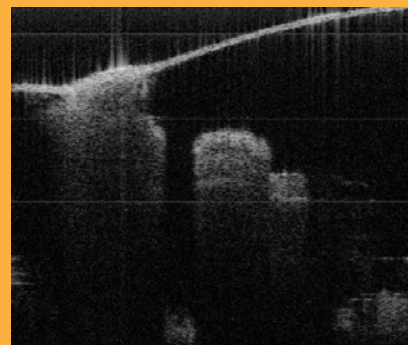


Figure 2: Aurisvue image of a normal middle ear. Various imaging artifacts are still present in this image due to inadequate implementation of pre-processing steps.

Curious for more information?

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