



Contribution ID: 30

Type: **not specified**

Simultaneous estimation of initial pressure and speed of sound in photoacoustic tomography

Monday, June 10, 2024 4:50 PM (15 minutes)

Photoacoustic tomography (PAT) is a biomedical imaging technique utilising the photoacoustic effect that can be induced by an external light pulse. The aim in PAT is to reconstruct an initial pressure distribution that has been generated in the target by illumination of light. This is carried out by measuring the propagating pressure waves on the boundary of the target, and performing a computational image reconstruction.

Conventionally in PAT, acoustic propagation is modelled in a homogeneous medium. This approximation, however, is not generally true in realistic targets. For example, assuming wrong speed of sound can cause artefacts in the reconstructions. One possible approach to mitigate these artefacts is to estimate the speed of sound in the target. However, estimation of the initial pressure and speed of sound distributions simultaneously is generally an unstable problem if no additional information is utilised. In this work, we propose a methodology for simultaneous estimation of initial pressure and speed of sound, when multiple illuminations of light are utilised. Results of numerical simulations are shown.

Authors: SUHONEN, Miika (University of Eastern Finland); TARVAINEN, Tanja (University of Eastern Finland); PULKKINEN, Aki (University of Eastern Finland); LUCKA, Felix (Centrum Wiskunde & Informatica); COX, Ben (University College London); ARRIDGE, Simon (University College London)

Presenter: SUHONEN, Miika (University of Eastern Finland)

Session Classification: Poster Session, Lab Tours & Reception

Track Classification: poster presentations