Universität Basel

Research Project

Organ Motion Compensation in Real-time US Images with a Statiscical Motion Model for Fusion Imaging

Third-party funded project

Project title Organ Motion Compensation in Real-time US Images with a Statiscical Motion Model for Fusion Imaging

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Organisation / Research unit

Departement Biomedical Engineering / Center for medical Image Analysis & Navigation (Cattin)

Department

Project start 01.12.2014

Probable end 30.11.2015

Status Completed

Ultrasound imaging is a cheap and cost effective imaging modality with a high temporal resolution and very low lag. Due to these advantages ultrasound is a widely spread modality. Despite its wide spread, interpreting ultrasound images is often very difficult due the inherent imaging artifacts like speckle and the limited resolution at depth. Furthermore, ultrasound is only able to visualises changes in mechanical impedance thus many liver tumours are not directly visible in the ultrasound image. MR and CT images in contrast are complementary as they show different tissue properties than ultrasound. Having the possibility for online fusion of preoperative MR and/or CT data would thus be of great diagnostic value. Unfortunately, the breathing induced organ motion complicates this real-time fusion as the liver deforms elastically.

In the proposed research we will apply our knowledge in modeling of organ motion to compensate the breathing induced deformations to allow for on-line fusion imaging of Ultrasound with MR and/or CT. The remaining uncertainty will be quantified under different application scenarios and the possible sources for inaccuracies identified.

Financed by

Private Sector / Industry

[Add publication]

Published results

3765784, Jud, Christoph; Moeri, Nadia; Cattin, Philippe C., Sparse Kernel Machines for Discontinuous Registration and Nonstationary Regularization, 978-1-4673-8852-8, Publication: ConferencePaper (Artikel, die in Tagungsbänden erschienen sind)

3786395, Jud, Christoph; Moeri, Nadia; Bitterli, Benedikt; Cattin, Philippe C., Bilateral Regularization in Reproducing Kernel Hilbert Spaces for Discontinuity Preserving Image Registration, 978-3-319-47156-3 ; 978-3-319-47157-0, Publication: ConferencePaper (Artikel, die in Tagungsbänden erschienen sind)

3765761, Jud, Christoph; Preiswerk, Frank; Cattin, Philippe C., Respiratory Motion compensation with Topology Independent Surrogates, Publication: ConferencePaper (Artikel, die in Tagungsbänden erschienen sind)

Add documents

Specify cooperation partners