

Publication

3D organ motion prediction for MR-guided high intensity focused ultrasound

ConferencePaper (Artikel, die in Tagungsbänden erschienen sind)

ID 2250101

Author(s) Arnold, Patrik; Preiswerk, Frank; Fasel, Beat; Salomir, Rares; Scheffler, Klaus; Cattin, Philippe C

Author(s) at UniBasel [Cattin, Philippe Claude](#) ;

Year 2011

Title 3D organ motion prediction for MR-guided high intensity focused ultrasound

Editor(s) Fichtinger, G; Martel, A; Peters, T

Book title (Conference Proceedings) Medical Image Computing and Computer-Assisted Intervention - MICCAI 2011 : 14th International Conference, Toronto, Canada, September 18-22, 2011 ; Proceedings

Volume 6892

Place of Conference Toronto

Publisher Springer

Place of Publication Berlin

Pages S. 623-630

MR-guided High Intensity Focused Ultrasound is an emerging non-invasive technique capable of depositing sharply localised energy deep within the body, without affecting the surrounding tissues. This, however, implies exact knowledge of the target's position when treating mobile organs. In this paper we present an atlas-based prediction technique that trains an atlas from time-resolved 3D volumes using 4DMRI, capturing the full patient specific motion of the organ. Based on a breathing signal, the respiratory state of the organ is then tracked and used to predict the target's future position. To additionally compensate for the non-periodic slower organ drifts, the static motion atlas is combined with a population-based statistical exhalation drift model. The proposed method is validated on organ motion data of 12 healthy volunteers. Experiments estimating the future position of the entire liver result in an average prediction error of 1.1 mm over time intervals of up to 13 minutes.

edoc-URL <http://edoc.unibas.ch/dok/A6308334>

Full Text on edoc No;

Digital Object Identifier DOI 10.1007/978-3-642-23629-7_76

PubMed ID <http://www.ncbi.nlm.nih.gov/pubmed/21995081>

ISI-Number WOS:000307197400076

Document type (ISI) inproceedings

Additional Information Also published in: Lecture notes in computer science. - Berlin : Springer. - 6891 (2011), S. 623-630