

## Research Project

### Development of an Optimised Laser Head for Contact-Free Laser Osteotomy with real-time automatic Depth Control for increased safety

#### Third-party funded project

**Project title** Development of an Optimised Laser Head for Contact-Free Laser Osteotomy with real-time automatic Depth Control for increased safety

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**Organisation / Research unit**

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

**Department**

**Project start** 01.10.2013

**Probable end** 30.09.2015

**Status** Completed

The aim of this project is to optimise the laser head of a Computer Assisted Robot-guided Laser Osteotome (CARLO) for contact free bone ablation. The technical developments will be in the field of beam profiling using advanced optics, the integration of OCT based real-time depth-control and the required controlling software.

The safety of the developed laser head will be tested in pre-clinical animal studies followed by an in-vivo clinical study on children requiring craniosynostosis.

**Financed by**

Innovation Promotion Agency CTI

#### Add publication

##### Published results

3287679, Baek, K.-W.; Deibel, W.; Marinov, D.; Griessen, Mathias; Bruno, A.; Zeilhofer, Hans-Florian; Cattin, Philippe C.; Juergens, Philipp, Clinical applicability of robot-guided contact-free laser osteotomy in crano-maxillo-facial surgery: in-vitro simulation and in-vivo surgery in minipig mandibles, 0266-4356, British journal of oral and maxillofacial surgery, Publication: JournalArticle (Originalarbeit in einer wissenschaftlichen Zeitschrift)

3287680, Baek, Kyung-Won; Deibel, Waldemar; Marinov, Dilyan; Griessen, Mathias; Dard, Michel; Bruno, Alfredo; Zeilhofer, Hans-Florian; Cattin, Philippe C.; Juergens, Philipp, A comparative investigation of bone surface after cutting with mechanical tools and Er:YAG laser, 1096-9101, Lasers in surgery and medicine, Publication: JournalArticle (Originalarbeit in einer wissenschaftlichen Zeitschrift)

3763476, Schneider, Adrian; Pezold, Simon; Baek, Kyung-Won; Marinov, Dilyan; Cattin, Philippe C., Simultaneous intrinsic and extrinsic calibration of a laser deflecting tilting mirror in the projective voltage space, 1861-6410 ; 1861-6429, International Journal of Computer Assisted Radiology and Surgery, Publication: JournalArticle (Originalarbeit in einer wissenschaftlichen Zeitschrift)

3765722, Schneider, Adrian; Pezold, Simon; Baek, Kyung-won; Marinov, Dilyan; Cattin, Philippe C., Direct Calibration of a Laser Ablation System in the Projective Voltage Space, 978-3-319-24552-2 ; 978-3-319-24553-9, Publication: ConferencePaper (Artikel, die in Tagungsbänden erschienen sind)

**Add documents**

**Specify cooperation partners**