

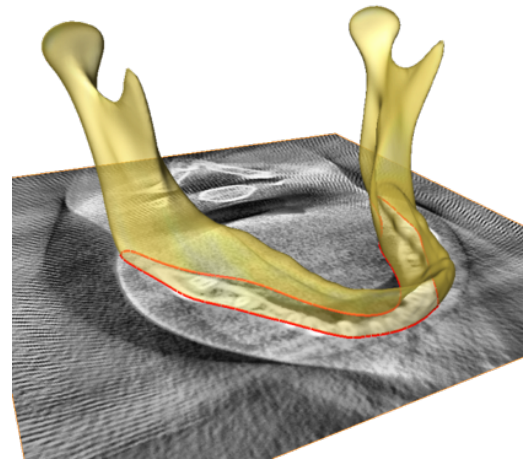
# Segmentation of Anatomical Structures in CT Images Through Deep Learning

## Your Profile

You are studying computer science and are interested in medical image analysis. You already have programming experience in Python and/or C++. Additionally, you are interested in or already have experience with deep learning.

## Master Thesis Topic

In a research project together with clinical partners at Charité in Berlin, we are investigating shape characteristics of various anatomical structures in the cranio-facial region, including lower and upper jaws, mandibular nerve and teeth. For that purpose, we have access to a large database of three-dimensional computed tomography (CT) scans, from which the shapes of anatomical structures can be extracted via image segmentation. Based on annotations provided by our clinical partners, the goal is to implement various state-of-the-art methods for segmentation based on Convolutional Neural Networks, evaluate their performance, and possibly provide methodological improvements, if required. To accelerate the training, online learning may be applied to avoid re-training neural networks from scratch every time additional labelled data becomes available.



Lower jaw reconstruction

## We Are Offering

In the ZIB research group *Computational Diagnosis and Therapy Planning* we work on problems in the medical domain by developing computer-assisted solutions. The focus lies on solutions with practical relevance, while contributing novel methodological developments. The proposed thesis topic allows an exciting introduction into medical image analysis and deep learning. The thesis is supervised at our institute in a team of researchers. Powerful workstations as well as a working place at ZIB are provided. The master thesis is granted at your university – either in Berlin or any other city.