Medical Imaging and Biometrics Group
Institute of Computer Graphics and Vision
Graz University of Technology

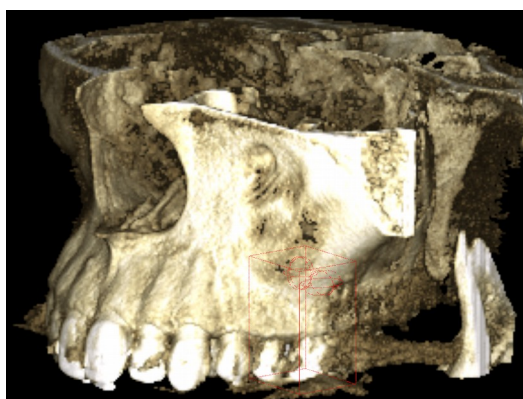Medical University of Graz

Automatic Detection of Infected Teeth in 3D CBCT Images Using Deep Convolutional Neural Network (DCNN)

Master's Thesis/Project

Description:

As a consequence of a bacterial, tooth associated infection are very common. Those pathologies are usually located in the surrounding of the root of the teeth. They can vary in diameter from a simple widening of the periodontal space up to several millimetres or more, being completely bone surrounded or perforating the adjacent anatomical borders. Furthermore, they potentially affect each of the around 30 roots of per jaw. The manual location of those frequently requires a large amount of work, depending on the number of investigated teeth and the quality of the data set as well as on the education and experience of the investigating doctor him or herself. The aim of the project is to train deep convolutional neural networks (DCNN) to automatically recognize all the infected teeth in the 3D Cone Beam Computed Tomography (CBCT) image.

The project is in collaboration with Dr.med.dent. Dr. Barbara Kirnbauer, LKH Graz, Department of Dentistry and Oral Health.

Objective:
- Perform literature overview.
- Train and test architectures for detection tasks.

Qualification:
- Knowledgeable with TensorFlow
- Interested in machine learning and computer vision

Literature:
Payer et al., Integrating spatial configuration into heatmap regression based CNNs for landmark localization*, Medical Image Analysis, 2019*

Contact ICG:
Darko Štern
stern@icg.tugraz.at

Webpage:
https://www.tugraz.at/institute/icg/research/team-bischof /medical-imaging-biometrics/