# Graduate School of Science and Technology Master's Thesis Abstract

| Laboratory name (Supervisor) | Imaging-based Computational Biomedicine (Yoshinobu Sato (Professor )) | | |
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| Thesis title | Bone Segmentation of Distal Radius Fractures in CT Scans | | |


Abstract

Distal Radius Fractures (DRFs) are prevalent orthopedic injuries, particularly causing comminuted fractures in middle-aged and elderly populations. These complex fractures often require intricate surgical interventions that depend critically on precise anatomical segmentation of the fracture site. Addressing this clinical need, we introduced a deep learning framework that utilizes a cascade neural network and applies a distance-weighted loss for the segmentation of bone fragments in DRFs. We assessed our model on a dataset of CT scans from 84 patients, amounting to 62,189 image slices. After a four-fold cross-validation experiment, the model demonstrated promising performance in terms of global and local Dice coefficients, facilitating the generation of detailed 3D representations of fracture sites. This segmentation streamlines surgical planning and provides valuable intraoperative insights, thereby empowering surgeons to improve operational precision and the potential for better patient outcomes.