

## Customized Design and Fabrication of Patient-Specific Cast

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### **Introduction**

Patient-specific instrument fabricated by 3D printing has been more and more widely used. In this project, the student is expected to develop a general design and manufacturing framework for the steps of scanning, modeling, optimization and fabrication of patient-specific cast.

### **Context**

The most challenge issues to be overcome in this project are

- The segmentation for incorporating the constraints of assemblability and disassemblability;
- The solid modeling method to convert a surface into a set of wire-frame and then solid models by the computation of Voronoi diagram and Minkowski-sum.

The software and related library will be provided by the PhD researcher of AM group.

### **Your Assignment**

To realize the design and fabrication of 3D printed patient-specific cast and explore the methodology to make a customized cast according to scanned models meanwhile considering the assemblability/disassemblability. For detail information, please contact Rob Scharff or Charlie Wang directly.

### **References**

[1] Xiaoting Zhang, Ka-Chun Chan, Charlie C.L. Wang, Kwok-Chuen Wong and Shekhar-Madhukar Kumta, "Computing stable contact interface for customized surgical jigs", 2015 IEEE Conference on Robotics and Automation (ICRA 2015), Seattle, Washington, 2015.