



Master of Science – Biomedical Engineering
Thesis Proposal

3D printed bone-like realistic anatomical models for surgical simulation

Cadaveric bones are used to train surgeons and trainees in medical procedures. However, such bones are scarce with limited supply, difficult to store, inconsistent in quality, and expensive to use for repeated training. As a result, it is necessary to develop a realistic alternative to cadaveric bones that is also less expensive and easier to obtain. 3D printing technology can overcome the limitations of cadaveric bones by providing a formulation and processing method for producing system-agnostic bone-like 3D printing filaments for surgical model printing. Printed anatomical bone models created with this technology can have a natural bone appearance and feel, providing a low-cost, readily available alternative that reduces the demand for cadaveric bones while still providing medical professionals with realistic training.

The master thesis project aims to conduct a feasibility study focusing on 3D printing radiopaque bone-like anatomical models. The master student will select and optimize the printing parameters to fabricate anatomical models, which will be evaluated on a simulation-based test bench. If you are interested, please get in touch with us. We are happy to provide more details.



Figure 1: Bone-like anatomical model (Credits: Fibretuff)

Nature of the Thesis

Medical image processing: 30%

Experimental: 40%

Documentation: 30%

Specific Requirements

- Basic knowledge of 3D printing is advantageous
- Strong interest in the use of 3D printing for medical applications
- Fundamental knowledge of medical image processing and computer-aided design

Supervisor

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