

CAN I COMBINE SCIENCE AND BUSINESS IN A SINGLE JOB?

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FAST, SMOOTH, ACCURATE AND RELIABLE SURFACE RECONSTRUCTION FROM BINARY VOLUMES FOR MEDICAL VISUALIZATION

BACHELOR'S OR MASTER'S THESIS - Surface Reconstruction from Medical Image Data

In medical image processing, anatomical structures are often represented as binary 3D images. However, for visualization purposes, surface representations are often required. Among other requirements, the surface representations have to be smooth and accurate. Furthermore, the processing time should be in the range of seconds and a per case parametrization by the user should not be necessary. Finally, an adaptive polygonization is desirable. Current approaches existing at Fraunhofer MeVis suffer from several limitations. Hence, the goals of this thesis are:

- Investigation, implementation and comparison of existing approaches (e.g. point clouds, level sets, smoothing...)
- Development and evaluation of an algorithm that adheres to the requirements mentioned above
- Integration into MeVisLab, a development framework for medical image processing and visualization

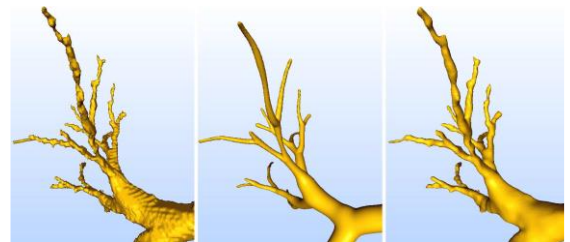
One possible solution is to investigate OpenVDB, a hierarchical data structure for the efficient storage and manipulation of sparse volumetric data, which also supports level set operations. However, the applicant is free to explore various approaches. A high degree of self-motivation and creativity is expected.

What we expect from you:

- Student of computer science or similar field of study
- Experience in programming (C++, Python)
- Interest in computer graphics and medical visualization

What you can expect from us:

- Self-determined work and space for your own ideas
- Work within a young and interdisciplinary team in a friendly and creative environment close to the University of Bremen



Fraunhofer MEVIS is one of the leading global and internationally networked research and development centers for computer assistance in image-based medicine. It follows a patient-centered and workflow-oriented approach to resolve clinically relevant issues in image-based diagnosis and therapy. Fraunhofer MEVIS focuses on epidemiologically significant diseases of the cardiovascular system, the brain, breast, liver and lung, as well as oncological disorders.

The Fraunhofer-Gesellschaft places a high value on the equality of men and women in the workplace. Women are underrepresented in this field, so we especially look forward to applications from women. Family and career are balanced through flexible work hours, part-time opportunities, parent-child spaces and emergency childcare. Employment of persons with disabilities is also a high priority for us and a candidate with disabilities who possesses equal qualifications will be given preference.

If you have any further questions, please contact:

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