02585, Digital 3D Geometry Processing, Course Outline

The following is an outline of course 02585 for autumn 2016 with the practical information that you will need. We expect that any changes to this document will be minor, but there could be some changes.

Location: Building 305, IT-005 (basement).

Time: E3B (Fri 13-17)

Teachers: Andreas Bærentzen, David Brander, Jakob Wilm, Camilla Himmelstrup Trinderup. (ordered roughly according to how much you will see us)

Teaching Assistant: Tuan Nguyen Trung.

Course structure: Usually we spend 45-90 minutes on a presentation of the material. This is followed by lab sessions where you try out the material in practice. The idea is to take a physical model (your own), scan it, and create a digital 3D model using the methods taught during the course. During the course, your digital model will change from raw scans to the final cleaned up, coherent triangle mesh.

Book: Guide to Computational Geometry Processing,
Bærentzen, Gravesen, Anton, Aanæs. Springer, London 2012 (available on springerlink.com).

Labs: We will provide a platform for the exercises based on the GEL framework which is a C++ library. The platform will be made available before the third lecture. After five of the labs you will be asked to hand in a brief report outlining your solution to the exercise problem.

Exam: 14 December 2016. The exam is oral, and you will be quizzed about material from the reading list (see below). The final grade is based on both your exercise hand-ins and also your performance at the exam. You will be presented with the opportunity to present material from your own exercise solutions before we ask more general questions.

Course reading list:
Chapters: 1 (introduction), 2 (linear algebra), 3 (differential geometry), 5 (polygonal meshes), 8 (curvature in triangle meshes), 9 (mesh smoothing), 10 (parametrization), 11 (simplifying and optimizing triangle meshes), 12 (spatial data structures), 14 (Delaunay triangulation), 15 (registration/ICP), 16 (surface reconstruction), 17 (volumetric methods for reconstruction), 18 (isosurface polygonization).

Chapters 1,2 and 3 are supplementary material. Further supplementary material will probably be provided.

Schedule: please see the CampusNet calendar. Note the schedule is also subject to change.

JANBA 2016