A U S H A N G

FREIE UNIVERSITÄT BERLIN
Fachbereich Mathematik und Informatik

Promotionsbüro, Arnimallee 14, 14195 Berlin

D I S P U T A T I O N

Mittwoch, 3. Juli 2019, 09:30 Uhr

Ort: Raum 024
(Fachbereich Mathematik und Informatik, Arnimallee 3, 14195 Berlin)

Disputation über die Doktorarbeit von

Herrn Martin Skrodzki

Thema der Dissertation:
Neighborhood Data Structures, Manifold Properties, and Processing of Point Set Surfaces

Thema der Disputation:
An introduction to the central structures and algorithms of point-based graphics

Die Arbeit wurde unter der Betreuung von **Prof. Dr. K. Polthier** durchgeführt.

Abstract:
Point sets arise naturally in many kinds of 3D acquisition processes, like laser-scanning. As early as 1985, they have been recognized as fundamental shape representations in computer graphics by Marc Levoy and Turner Whitted. As immediate output of many acquisition processes, point sets have diverse applications, e.g. in archeology, manufacturing, or autonomous driving. Furthermore, surface representations based on point sets have a more than 15 year long history in geometry processing. Many algorithms have been proposed for the processing of this type of data. A guiding principle of these algorithms is the direct processing of raw scanning data without prior meshing -- a principle that has a long-established history in classical numerical computations. Aside from the advantage of direct processing after acquisition, point sets additionally have lower storage costs compared to meshed data, making them a lightweight representation. However, the missing connectivity in point sets – when compared to meshes – poses new challenges. Namely, a neighborhood relation has to be established on the point set and an alternative to face areas has to be found as weighting terms in discretizations and algorithms.
The purpose of the talk is to give an overview on the central structures and algorithms of point-based graphics. Following a typical application scenario – anisotropic denoising of a point set – several important aspects of point set processing will be discussed, like neighborhood relations, normal computation, and weighting terms.

Die Disputation besteht aus dem o. g. Vortrag, danach der Vorstellung der Dissertation einschließlich jeweils anschließenden Aussprachen.

Interessierte werden hiermit herzlich eingeladen

Der Vorsitzende der Promotionskommission
Prof. Dr. K. Polthier