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

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Ort: Raum 108/109, Arnimallee 6, 14195 Berlin

Disputation über die Doktorarbeit von

Herrn Christoph von Tycowicz

Thema der Dissertation:

Concepts and Algorithms for the Deformation, Analysis, and Compression of Digital Shapes

Thema der Disputation:

Interactive spacetime control of deformable objects

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

Abstract: Creating motions of objects or characters that are physically plausible and follow an animator's intent is a key task in computer animation.
The spacetime constraints paradigm is a valuable approach to this problem, but it suffers from high computational costs.
We present a technique based on spacetime constraints that controls the motion of deformable objects and offers an interactive response [1].
This is achieved by a model reduction of the underlying variational problem, which combines dimension reduction, multipoint linearization, and decoupling of ODEs. After a preprocess, the cost for creating or editing a motion is reduced to solving a number of one-dimensional spacetime problems, whose solutions are the wiggly splines introduced by Kass and Anderson [2].
Interactive response is due to a new fast and robust numerical scheme for solving a set of one-dimensional problems based on an explicit representation of the wiggly splines.

[1] K. Hildebrandt, C. Schulz, C. von Tycowicz, and K. Polthier. Interactive spacetime control of deformable objects. ACM Trans. Graph. 31 (SIGGRAPH 2012), 71:1-71:8.
[2] M. Kass and J. Anderson. Animating oscillatory motion with overlap: Wiggly splines. ACM Trans. Graph. 27 (SIGGRAPH 2008), 28:1– 28:8.

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