

FREIE UNIVERSITÄT BERLIN Fachbereich Mathematik und Informatik

Promotionsbüro, Arnimallee 14, 14195 Berlin

DISPUTATION

Freitag, 9. Mai 2014, 13.00 Uhr

Ort: Seminarraum 046, Takustr. 9, 14195 Berlin

Disputation über die Doktorarbeit von

Herrn Dror Atariah

**Thema der Dissertation:
Parameterizations in the Configuration Space
and Approximations of Related Surfaces**

**Thema der Disputation:
On Sampling Based Algorithms
for Solving the Motion Planning Problem**

Die Arbeit wurde unter der Betreuung von **Prof. Dr. G. Rote** durchgeführt.

Abstract: Given a robot and a workspace scattered with obstacles, a natural problem to consider is the motion planning problem (a.k.a. the "piano movers problem"). That is, given the source and target placements of the robot in the workspace, determine whether the robot can move from one placement to the other. Additionally, if such movement is possible, a feasible description is also desired. This problem was first posed over four decades ago.

A sample based algorithm for solving the motion planning problem functions in two phases. First, it studies the connectivity of the corresponding configuration space. Second, based on the study phase, it answers queries determining whether and how the robot can be moved from one placement to the other.

In this talk we present in detail one of the most celebrated sample based algorithms: the Probabilistic Roadmap Method. We elaborate on some implementation details of the method and prove that it is probabilistically complete. Furthermore, we briefly present a more recent sampling based algorithm known as the Motion Planning via Manifold Samples.

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. G. Rote