

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

Dienstag, 21. September 2021, 16:00 Uhr

Ort: gr. Hörsaal* & [WebEx](#)

(Takustr.9, 14195 Berlin)

(* Begrenzte Teilnehmerzahl unter Kontrolle der 3G Regeln – geimpft, genesen, getestet)

Disputation über die Doktorarbeit von

Frau Katharina Alexandra Klost

Thema der Dissertation:

Geometric Graphs: Reachability, Long Trees and Short Cycles

Thema der Disputation:

Shortest Paths in Unit Disk Graphs

Die Arbeit wurde unter der Betreuung von **Prof. Dr. W. Mulzer** durchgeführt.

Abstract: Unit disk graphs are a common and extensively studied model for wireless networks. In a unit disk graph, the vertices are defined by a set of points in the plane, and two vertices are connected with an edge if and only if their distance is at most 1.

The length of a path between two vertices in a unit disk graph can be defined either as the number of edges on the path, or as the sum of the distances of the vertices on the path. In the first case, we talk about "unweighted" unit disk graphs, while in the second case, we talk about "weighted" unit disk graphs.

The single source shortest path problem in a graph asks for the shortest path tree rooted at a start vertex. In general unweighted graphs the problem is usually solved efficiently by using breadth first search. In weighted graphs with positive real weights, Dijkstra's algorithm and variants thereof are used.

We consider the single source shortest path problem in both unweighted and weighted unit disk graphs. We describe the algorithms of Chan and Skrepetos, and Efrat et al. for the unweighted case and consider their similarities and differences. Furthermore we take a look at the algorithm of Wang and Xue for the weighted case and again compare the techniques used with those for the unweighted case.

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. W. Mulzer