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, 5. September 2017, 12.00 Uhr

Ort: Zuse-Institut Berlin (ZIB)
Seminarraum, Takustraße 7, 14195 Berlin

Disputation über die Doktorarbeit von

Herrn Christian Tobias Willenbockel

Thema der Dissertation:

Divisive Variational Bayesian Algorithms for the Clustering of large and complex Networks

With Applications to Earthquake Networks

Thema der Disputation:

Different ways for the clustering of directed networks: Null Models, Flow Models and Block Models

Die Arbeit wurde unter der Betreuung von **Prof. Dr. Chr. Schütte** durchgeführt.

Abstract: The identification of groups of vertices of a network which are more densely connected to each other than to the rest of the network is an important task in many scientific areas. Two well known discrete methods for identifying such groups of vertices, are Modularity optimisation and the Infomap algorithm. The first method is based on a null model whereas the latter is based on a flow model. Both methods have in common that they can be extended to directed networks. In this talk, I will first review both methods. Then I will show the results of their application to selected directed synthetic and real world networks. This will demonstrate advantages and limitations of both methods.

In the second part, I will present the new Blockloading algorithms for inference of the Stochastic Block Model (SBM) for weighted and directed networks. With these methods, clusters of vertices which exhibit a similar connection profile can be identified. Meaningless, sparsely connected vertices can be identified with the new Stochastic Block Model with irrelevant Vertices (SBMIV). The application of these methods to large and complicated networks will show that these new methods provide a solution to tasks which other methods are unable to solve with meaningful results or with an acceptable computation time.

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. Chr. Schütte