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, 17. Dezember, 10.15 Uhr

Ort: Pi-Gebäude, Raum 108/109, Arnimallee 6, 14195 Berlin

Disputation über die Doktorarbeit von

Herrn László Dávid

Thema der Dissertation:
Algorithms for the constraint-based analysis of metabolic networks

Thema der Disputation:
Filtering metabolic pathways using sparsest linear bases

Die Arbeit wurde unter der Betreuung von **Prof. Dr. A. Bockmayr** durchgeführt.

Abstract: In many cases, microorganisms can perform chemical feats that current human-designed industrial systems cannot mimic. Metabolic pathways are an important tool in understanding how these chemical processes work and how particular source compounds may be transformed into products on a cellular level. Due to the combinatorial complexity of the underlying models, exhaustively enumerating every pathway is unfeasible for genome-scale models.

In this talk, we will present a recent approach [1] which defines pathways structures by computing the sparsest null space of the model. The problem is shown to be equivalent to the matrix sparsification problem and can be solved using the combination of a greedy algorithm and mixed integer programming. After presenting the MinSpan algorithm [1], we will analyze the pathways found by this method and discuss its limitations.

[1] A Bordbar, H Nagarajan, NE Lewis, H Latif, A Ebrahim, S Federowicz, J Schellenberger, BO Palsson. Minimal metabolic pathway structure is consistent with associated biomolecular interactions. Mol Syst Biol. (2014) 10: 737

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. A. Bockmayr