

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

Freitag, 7. Oktober 2022, 09:00 Uhr

Ort: Seminarraum 032

(FB Mathematik und Informatik, Arnimallee 6, 14195 Berlin)

Disputation über die Doktorarbeit von

Herrn Philip Daniel Kleinert

Thema der Dissertation:

Computational interpretation of disease-causing, structural, and non-coding human genetic variants

Thema der Disputation:

Computational prediction of protein structures using a neural-network based model

Die Arbeit wurde unter der Betreuung von **Prof. Dr. M. Vingron** durchgeführt.

Abstract: Praised as nothing less than a revolution to molecular biological research, a novel method to predict protein structures computationally was introduced in 2021. As proteins are one of the most diverse and fundamental building blocks of life, predicting their structures is challenging and crucial to understanding human health. AlphaFold shifts the focus from laborious experimental protocols to predicting the 3D-structures of more than 200 million proteins computationally, including almost all known human proteins. Using machine learning AlphaFold integrates features such as multiple sequence alignments as well as value sets derived from experimental datasets into a deep learning algorithm, greatly outperforming existing methods in accurately predicting protein shapes. Researchers are now able to answer long standing biological questions, such as modelling the nuclear pore complex by integrating the predicted structures of about 1000 pieces of 30 different proteins. AlphaFold shows the potential of computational approaches to be used in aiding basic research that ultimately benefits human health.

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. M. Vingron