

FREIE UNIVERSITÄT BERLIN
Fachbereich Mathematik und Informatik

Promotionsbüro, Arnimallee 14, 14195 Berlin

DISPUTATION

Dienstag, 25. April 2017, 13.00 Uhr

**Ort: Raum SR1, Turm 3, Erdgeschoss Max
Planck Institut für molekulare Genetik
Innstraße 63-73, 14195 Berlin**

Disputation über die Doktorarbeit von

Herrn Wolfgang Kopp

Thema der Dissertation:

Statistical methods for motif hit enrichment in DNA sequences

Thema der Disputation:

Deep learning - An overview with applications in computational biology

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

Abstract: A decade ago deep learning has emerged as a powerful machine learning approach to train large neural networks with many feature layers. Supervised learning of neural networks makes use of the so-called backpropagation algorithm which was invented more than three decades ago. However, it was not until recently that backpropagation could successfully be applied to train large neural networks.

We discuss reasons for that and focus on modern considerations that have further advanced deep learning-based models, including the advent of relu-activation functions instead of sigmoid-activation functions and dropout as a means to regularize the network's capacity.

Finally, we shall illustrate the use of deep neural networks to predict transcription factor binding across the human genome.

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