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

Montag, 28. März 2022, 09:00 Uhr

Ort: Seminarraum 108/109

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

Disputation über die Doktorarbeit von

Herrn Ray Chew

Thema der Dissertation:

Balanced Local Data Assimilation with a Blended Numerical Model for Geophysical Flows

Thema der Disputation:

Combining data assimilation and machine learning to emulate a dynamical model

Die Arbeit wurde unter der Betreuung von **Prof. Dr. R. Klein** durchgeführt.

Abstract: A novel approach to combining machine learning and data assimilation was introduced by Brajard et al. (2020). Sparse and noisy observations are assimilated into a surrogate model to emulate chaotic dynamics. Here, the chaotic dynamics emulated are that of the Lorenz-96 system, and the surrogate model is based on deep convolutional and residual neural network architectures. The data assimilation engine is the finite-size ensemble Kalman filter. Sparse and noisy observations obtained from the simulation of a Lorenz-96 system are used as a training set for the neural network. Observations are then assimilated into the output of the trained neural network, and the resulting analysis is used as a training set for the neural network. This process of training and assimilation is repeated for several cycles. Finally, the ability of the trained surrogate model to reproduce the chaotic dynamics of the Lorenz-96 system and its forecast capabilities are investigated.

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. R. Klein