

**Vortrag von Frau M.Sc. Aida Farahani**  
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**„Exploring Deep Learning Approaches for 3D Deformation: Toward Finite Element Method Distillation“**

The thesis introduces neural frameworks for modeling 3D deformations with the goal of enhancing the predictive accuracy and computational efficiency of traditional Finite Element Method (FEM) simulations. It explores two complementary approaches: a single-step deformation model that employs implicit neural representations and signed distance fields to approximate FEM-based deformations up to 400× faster than conventional simulations, and a multi-step deformation model that formulates deformation as a sequential decision-making process within a deep reinforcement learning framework. Supported by two custom datasets, DefBeam and DefCube, the study demonstrates that AI-driven methods can effectively complement FEM by accelerating simulations and improving accuracy in applications such as material design, virtual prototyping, and industrial forming.

**Öffentliche Verteidigung im Rahmen des Promotionsverfahrens**

“Exploring Deep Learning Approaches for 3D Deformation: Toward Finite Element Method Distillation”

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Technische Universität Chemnitz, Straße der Nationen 62, Raum: A12.336 (alt: 1/336)

Alle interessierten Personen sind eingeladen.