



Der Vorsitzende des Promotionsausschusses

E I N L A D U N G

Hiermit lade ich ein zum öffentlichen Promotionskolloquium von

Herrn M.Sc. Sebastian Gratz-Kelly

Intelligente Materialsysteme
(Prof. Dr.-Ing. Stefan Seelecke)

am

Montag, 26. Mai 2025, 10:00 Uhr s.t.

per Videokonferenz; Link für MS Teams: [Promotionskolloquium - Gratz-Kelly | Microsoft Teams](#)
[| Meetup-Join](#)

Raum für die Prüfung: Konferenzraum 10.1.09, Halle 10, ZeMA gGmbH, Eschberger Weg 46,
66121 Saarbrücken.

Thema der Dissertation:

Multifunctional Dielectric Elastomer Transducers as Integrated Audio-Tactile Interfaces with Self-Sensing Capability

Dielectric elastomer transducers (DETs) offer advantages over conventional electromechanical drives due to high energy efficiency, low weight, and dual actuator-sensor functionality. This dissertation explores DETs as multifunctional elements for human interaction. By advanced control of a single DET, different resonance regions are stimulated and validated. A novel DET operating principle enables tactile and acoustic feedback with input detection. This innovation is systematically developed, optimized and practically implemented in a multifunctional device, featuring an integrated audio-tactile feedback unit with self-sensing capability. The underlying principles and methodologies are thoroughly described and validated. DET-based multifunctional systems are evaluated for usability across various applications. The developed technology is showcased through multiple demonstrators, highlighting applications such as assistive tools and smart textile-integrated systems.

Saarbrücken, 12. Mai 2025

Prof. Dr. Uli Kazmaier