Naturwissenschaftlich-Technische Fakultät

UNIVERSITÄT DES SAARLANDES

Der Vorsitzende des Promotionsausschusses

E I N L A D U N G

Hiermit lade ich ein zum öffentlichen Promotionskolloquium von

Frau M.Sc. Marcelle Guedes de Medeiros Lopes
Experimentalphysik
(Prof. Dr. Lars Kaestner)

am

Freitag, 10. Oktober 2025, 16:00 Uhr s.t.
per Videokonferenz: Link für MS Teams: https://kurzlinks.de/bdri
Raum für die Prüfung: Seminarraum E.04, Campus 2.6

Thema der Dissertation:

Artificial Intelligence-Based Assessment for Red Blood Cell-Related Disease Characterization

Red blood cell (RBC) deformability is crucial for microvascular perfusion and gas exchange, allowing adaptation to varying flow conditions. Their continuous circulation enables RBCs to reflect systemic abnormalities, making them potential biomarkers for complex diseases and therapy monitoring. This thesis examines RBC deformability changes in Neuroacanthocytosis Syndromes (NAS), Sickle Cell Disease (SCD), and COVID-19. Traditional diagnostics rely on expensive, time-consuming tests and manual morphology assessment, which are labor-intensive and subjective. To overcome these limitations, an automated framework using artificial intelligence (AI) and image processing is proposed to analyze single-cell morphology in real-time flow. This approach enables objective, scalable characterization of RBC abnormalities, advancing diagnostic and monitoring strategies in hematological and systemic disorders

Saarbrücken, 25. September 2025

Prof. Dr.-Ing. Georg Frey

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