Invitation to the Oral Examination – Department CS

For the occasion of his/her examination for a Doctoral Degree,

Alejandra Castelblanco Cruz

will present his/her dissertation entitled/on

Advancing Non-Invasive Newborn Health Monitoring with Artificial Intelligence

on ***30th April 2026*** at ***10:00 CET***

Attendance to the presentation is open to the public. The presentation will be in ***English***.

The candidate, all members of the Examination Committee, and authorized examiners of the TUM School of CIT are invited to the presentation and subsequent oral examination.

The presentation and subsequent examination will take place in person:
in ***Seminar Room 041, HDC Building (NHB3620),***
Helmholtz Munich, Ingolstädter Landstraße 1

And online via ***MS Teams***:
https://teams.microsoft.com/meet/37115106512863?p=sqHKkDL9dyj4lIFBU9

Meeting ID: 371 151 065 128 63

Passcode: Bk6bX7Vv

Examination committee:

Chair: **Prof. Dr. Zeynep Akata-Schulz**

First Examiner: **Prof. Dr. Julia A. Schnabel**

Second Examiner: **Prof. Dr. Bernhard Kainz**

Garching, **14 April 2026**

Mailing list:

Members of the examination committee

Doctoral candidate

Abstract:

English: Advances in artificial intelligence for medical imaging, show vast potential for improving newborn physiological monitoring in the clinic. In this doctoral thesis, we develop and investigate deep learning methods in three clinical applications: (1) Video-based Heart Rate Measurement for Newborns, (2) Wearable Colorimetric Sensors for Biomarker Monitoring, (3) MRI 3D Features for Assessment of Neonatal Lung Disease. Our aim is to support newborn care through automated non-invasive monitoring, providing higher diagnostic sensitivity and quantitative clinical assessments.

German: Fortschritte in der künstlichen Intelligenz für die Medizin ermöglichen Verbesserungen der physiologischen Überwachung von Neugeborenen in der Klinik. In dieser Doktorarbeit entwickeln und untersuchen wir KI-Methoden in drei klinischen Anwendungen: (1) Videobasierte Herzfrequenzmessung, (2) Biomarker-Messung mit tragbaren kolorimetrischen Sensoren und (3) MRT-3D diagnostische Bildgebung für Atemwegserkrankungen bei Neugeborenen. Ziel ist es, die Neugeborenenversorgung durch automatisierte, nicht-invasive Überwachung, höhere diagnostische Sensitivität und quantitative klinische Bewertungen zu unterstützen.

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