



Der Vorsitzende des Promotionsausschusses

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## EINLADUNG

Hiermit lade ich ein zum öffentlichen Promotionskolloquium von

**Herrn M.Sc. Yannick Robin**

Messtechnik

(Prof. Dr. Andreas Schütze)

am

**Mittwoch, 5. Juni 2024, 13:30 Uhr s.t.**

per Videokonferenz; Link für MS Teams: <https://kurzelinks.de/y59b>

Raum für die Prüfung: Gebäude C7.4, Konferenzraum 1.17

### **Thema der Dissertation:**

#### **The Potential of Deep Learning for Gas Sensor Evaluation and Calibration**

Metal oxide semiconductor gas sensors are promising candidates for selectively measuring harmful pollutants indoors. However, they suffer from their lack of selectivity, sensor-to-sensor variance, and drift over time. Advanced calibration and operation modes are required to overcome some of these sensor drawbacks. However, calibration can be costly, time-consuming, and complicated, even without complex operation modes. Within this thesis, a new data-driven model for the evaluation and calibration of metal oxide semiconductor gas sensors is introduced. The newly developed model, TCOCNN, is a multi-layer convolutional neural network. Together with methods from the field of deep learning, it is possible to tackle long calibration times and sensor-to-sensor variation. It was shown that it is possible to reduce the calibration time by up to 99.3 % and significantly reduce the influence of sensor-to-sensor variance.

Saarbrücken, 22. Mai 2024

Prof. Dr. Uli Kazmaier