



# DR. MOEIN SAMADI

AACHEN UNIVERSITY

Integrating knowledge into learning  
from data: what, why, and how

Wednesday 15th April 13:00 - 14:00,  
School of Engineering A4.01

## TALK

Modern healthcare needs models that generalize beyond biased and incomplete clinical data. Yet purely mechanistic models are often too limited, and purely data-driven AI can struggle with extrapolation, interpretability, and the “curse of dimensionality.” This talk explores:

- Hybrid (mechanistic + data-driven) modelling, where scientific and clinical knowledge shapes information flow, while learning fills in the key “black-box” components.
- When and why hybrid approaches can improve robustness (especially across institutions and shifting patient populations) while reducing data demands and enabling more meaningful interpretation.
- Looking ahead to neuro-symbolic methods that combine neural models (including LLMs) with symbolic constraints (rules and knowledge graphs).
- Highlight opportunities for reliable biomedical knowledge management.

## BIOGRAPHY

Dr. Moein Samadi is a Postdoctoral Researcher at the Institute of Computational Biomedicine at RWTH Aachen University. He received his PhD in Computational Engineering Sciences from RWTH Aachen, where he studied uncertainty quantification for hybrid models in the life sciences. His research focuses on hybrid modelling to improve the reliability and interpretability of critical-care predictive models in high-stakes settings.