



University
of Basel

Department of
Biomedical Engineering



Seminar Series:

Latest Breakthroughs in Biomedical Engineering Research

Location: DBE Science Lounge, Hegenheimermattweg 167C, 4123 Allschwil

Date & Time: Thursday 19.03.2026 | 16:30 – 17:30

Host: Dr. Martin Styner

Responsible AI in medical image analysis: applications in neuroimaging

Meritxell Bach Cuadra

*CIBM Center for Biomedical Imaging, Radiology Department, University Hospital Lausanne (CHUV)
and Lausanne University (UNIL)*

Abstract

Machine learning (ML) has a remarkable ability to solve many key tasks in medical image analysis from restoration, reconstruction, segmentation to image synthesis or classification. While DL results reported so far are impressive, serious reservations have been raised regarding their robustness to domain shifts and to which extent we can trust their output. I will first overview the different aspects of “responsible” ML which aims at reinforcing the trustworthy behavior of models, a key need in the adoption of deep learning for healthcare applications. I will then briefly present our contributions in that context with focus on the tasks of automated quality control and uncertainty estimation in neuroimage analysis and show its translation to two different applications: early brain development and support evaluation of multiple sclerosis patients.

Biosketch

Meritxell Bach Cuadra is Associate Professor and heads the CIBM Signal Processing CHUV-UNIL Computational Neuroanatomy & Fetal Imaging Section. Her research interests are focused on novel image processing and safe machine learning-based medical image analysis. Her research aims are to ensure the trustworthy behaviour of machine learning to support diagnosis and prognosis, lead social conscious machine learning methods to tackle biases in healthcare, together with efforts in translational research, dissemination, and access of advanced medical technology through domain-shift robust and reproducible large-scale/longitudinal validation of the developed image analysis methods. Her major research projects are applied to paediatric brain MRI analysis, lesion segmentation and classification in Multiple Sclerosis and eye MR image analysis.