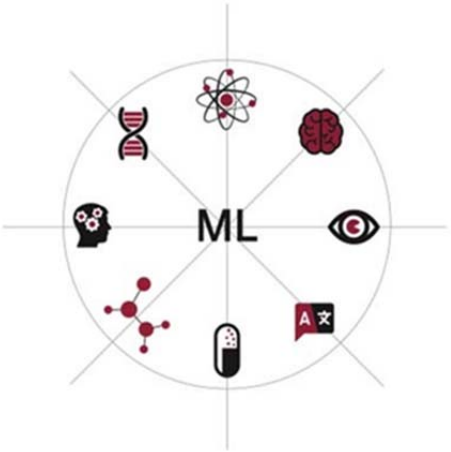

Cluster of Excellence
Machine Learning:
New Perspectives for Science

www.ml-in-science.uni-tuebingen.de

Cluster Colloquium "Machine Learning"

Seminar Series of the Cluster of Excellence

Wednesday January 08, 2020

2:00 - 3:00 pm, followed by Get Together

Lecture Hall, AI Research Building
Maria von Linden-Str. 6 (ground floor), 72076 Tübingen

Mining observations and climate models for detecting and attributing anthropogenic climate change in the world's water cycle

Lukas Gudmundsson
Institute for Atmospheric and Climate Science ETH Zürich, www.iac.ethz.ch/people/lukasgu
(Host: Fabian Sinz) Institut für Atmosphäre und Klima,

One of the key concerns with anthropogenic climate change are its effects on the terrestrial water cycle. Model projections indicate that anthropogenic climate change can affect regional water availability and may trigger more floods and droughts. While there is mounting evidence showing human impacts in the atmospheric part of the water cycle, the limited availability of relevant observations has so far prevented an unambiguous detection and attribution of anthropogenic climate change in terrestrial water resources and hydrological extremes. Recent advances in mobilizing large quantities of river flow time series around the globe and breakthroughs in data-driven reconstructions of essential freshwater variables using machine learning allow now for an unprecedented assessment of global hydrological change. Causal drivers of observed change are investigated using climate change detection and attribution methods, that ingest both observational information and model based evidence. The analysis allows to conclude that it is very likely that anthropogenic climate change is already impacting water resources and hydrological extremes at the global scale.

Biography:

Lukas Gudmundsson is a climate scientist with a special interest in global freshwater dynamics. After finalizing his PhD on large-scale hydrology and the University of Oslo (Norway), he moved to the Institute of Atmospheric and Climate Science, ETH Zurich (Switzerland), where he now works as senior scientist, lecturer and daily advisor of graduate students. In his recent work, Lukas Gudmundsson uses machine learning to reconstruct global water availability and explores fingerprints of anthropogenic climate change in freshwater resources and hydrological extremes.