



Cluster of Excellence

Machine Learning: New Perspectives for Science

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

Machine Learning in Science

*Cluster Conference on July 22 and 23, 2019 in Tübingen
(Alte Aula and Pflughofsaal)*

Registration: If you would like to attend the meeting, please register by July 15 latest by sending an email to Sebastian Schwenk (sebastian.schwenk@uni-tuebingen.de). Please indicate on which day(s) you would like to participate.

Monday, July 22, 2019

Venue: Alte Aula, Münzgasse 30, 72070 Tübingen

09:00	<i>Opening Remarks</i> Ulrike von Luxburg, Philipp Berens Speakers of the Cluster of Excellence "Machine Learning", University of Tübingen
09:15	<i>Towards Neural Networks Which Probably Know When They Don't Know</i> Matthias Hein Department of Computer Science, University of Tübingen
10:00	<i>Inception Loops - Using Deep Learning to Control Biological Neurons</i> Fabian Sinz Department of Computer Science, University of Tübingen
10:45	<i>Coffee Break</i>
11:15	<i>Machine Learning for Heterogeneous and Partially Biased Data in Medicine</i> Nico Pfeifer Department of Computer Science, University of Tübingen
12:00	<i>The Art of Using t-SNE for Visualization of Very Large Data Sets</i> Dmitry Kobak Institute for Ophthalmic Research, University of Tübingen

12:45	<i>Lunch</i>
13:45	<i>Machine Learning inside Scientific Methods and Procedures</i> Philipp Hennig Department of Computer Science, University of Tübingen
14:30	<i>Dynamic Structural Equation Models in the Social and Behavioral Sciences and Some Estimation Problems</i> Augustin Kelava Methods Center, University of Tübingen
15:15	<i>Identifying Climate, Vegetation, and Plate Tectonic Controls on Earth's Topography</i> Todd Ehlers Department of Geosciences, University of Tübingen
16:00	Poster Session and Coffee <i>List of posters see below, page 4 *</i>
18:00	General Assembly of the Cluster of Excellence (<i>non-public</i>)
19:00	<i>Speaker's Dinner</i> (<i>non-public</i>)

Tuesday, July 23, 2019

Venue: Pflughofsaal, Schulberg 2 (Pflughof), 72070 Tübingen

09:00	<i>Language Change as a Random Walk in Vector Space</i> Gerhard Jäger Institute of Linguistics, University of Tübingen
09:45	<i>Ethics and Explainability</i> Eric Raidl, Thomas Grote, Thilo Hagendorff Ethics & Philosophy Lab, Cluster of Excellence Machine Learning, University of Tübingen
10:45	<i>Coffee Break</i>
11:15	<i>Filter ranking for neural network compression</i> Mijung Park Department of Computer Science, University of Tübingen

12:00	<p><i>Fairness and Interpretability in ML for Consequential Decision Making</i> Isabel Valera Max Planck Institute for Intelligent Systems, Tübingen</p>
12:45	<p><i>Lunch</i></p>
13:45	<p><i>Statistical Limits of Hypothesis Testing: Do We Expect Too Much from ML?</i> Debarghya Ghoshdastibar Department of Computer Science, University of Tübingen</p>
14:30	<p><i>How to Learn Predictive Conceptual Structures, including Causal Relationships, and Generate Goal-Directed Control with them? Achievements and Challenges</i> Martin Butz Department of Computer Science, University of Tübingen</p>
15:15	<p><i>Machine Learning Algorithms as Tools and Models in Vision Science</i> Felix Wichmann Department of Computer Science, University of Tübingen</p>
16:00	<p><i>Closing Remarks</i> Ulrike von Luxburg, Philipp Berens Speakers of the Cluster of Excellence “Machine Learning”, University of Tübingen</p>

Weber, D, Kasneci E., Zell A. (*Cluster Innovation Fund Project*)

Human-robot interface with eye-tracking and augmented reality to teach mobile robots about the real-world.

University of Tübingen, Department of Computer Science

Valera I.¹, Utz S.² (*Cluster Innovation Fund Project*)

Extracting expertise from tweets: Exploring the boundary conditions of ambient awareness).

¹Max Planck Institute for Intelligent Systems Tübingen, ²Leibniz-Institut für Wissensmedien

Luxburg U., Wichmann F. (*Cluster Innovation Fund Project*)

Machine learning approaches for psychophysics with ordinal comparisons

University of Tübingen, Department of Computer Science

Zabel S.¹, Hennig P.², Nieselt K.¹ (*Cluster Innovation Fund Project*)

Visualizing Uncertainty from Data, Model and Algorithm in Large-Scale Omics Data

University of Tübingen, ¹Center for Bioinformatics Tübingen, ²Department of Computer Science

Karlbauer, M.¹, Lensch H.¹, Scholten T.², Butz M.¹ (*Cluster Innovation Fund Project*)

Short-to-Mid Scale Weather Forecasting with a Distributed, Recurrent Convolutional ANN

University of Tübingen, ¹Department of Computer Science, ²Department of Geosciences

Behrens, T.¹, Schmidt, K.¹, Hennig, P.², Scholten, T.¹ (*Cluster Innovation Fund Project*)

Feature engineering for spatial modelling.

University of Tübingen, ¹Department of Geosciences, ²Department of Computer Science

Baayen H.¹, Lensch H.² (*Cluster Innovation Fund Project*)

Enhancing Machine Learning of Lexical Semantics with Image Mining

University of Tübingen, ¹Department of Linguistics, ²Department of Computer Science

Macke J.¹, Hennig P.², Berens P.³, Oberlaender M.⁴

Automatic Data-driven Inference of Mechanistic Models

¹ Technische Universität München, Computational Neuroengineering Group ¹

University of Tübingen, ²Department for Computer Science, ³Institute for Ophthalmic Research

⁴Center of advanced european studies and research

Pawlowski, T.¹, Berens, P.², Kelava, A.³

Emotional cues and alcohol use: evidence from football.

University of Tübingen, ¹Department Institute of Sport Science, ²Institute for Ophthalmic Research, ³Methods Center

Kilian P.

Predicting math student college dropout with sparse information using approaches from statistical learning

University of Tübingen, Methods Center

Klopotek M., Oettel M.

Variational autoencoders put up to the test in learning a statistical-mechanical model system

University of Tübingen, Institut für Angewandte Physik

Lin SC, Oettel M.

Classical density functionals from machine learning

University of Tübingen, Institut für Angewandte Physik

Greco A.¹, Starostin V.¹, Hinderhofer A.¹, Gerlach A.¹, Karapanagiotis C.², Liehr S.², Kowarik S.², Schreiber F.¹

Fast Scattering Data Analysis Using Machine Learning.

¹*University of Tübingen, Institut für Angewandte Physik, Uni Tübingen*, ²*Bundesanstalt für Materialforschung und -prüfung (BAM), Berlin*

Sümer Ö.^{1,2}, Kasneci E.¹

Attention Flow: End-to-End Joint Attention Estimation

University of Tübingen, ¹*Department of Computer Science*, ²*Hector Research Institute of Education Sciences and Psychology (HIB)*

Fuhl W., Kasneci G., Rosenstiel W., Kasneci E.

Training decision trees as replacement for convolution layers

University of Tübingen, Department of Computer Science

Zadaianchuk A., Martius G.

Equation Learning for Extrapolation and Control

Max Planck Institute for Intelligent Systems Tübingen