

Symposium

Data Science for Personalized Medicine

Deep Insights and New Results

Wednesday, June 20, 2018, 10:30-13:00

Medical University of Vienna

Spitalgasse 23, 1090 Vienna

BT 88, 2nd floor, Jugendstilhösraum

About the symposium:

This symposium is the fourth in an annual series of events presenting the latest results from research in **Data Science for Personalized Medicine (DS4PM)** at the Center for Medical Statistics, Informatics and Intelligent Systems (**CeMSIIS**), their partner institutions, and beyond. It aims at addressing clinicians, biologists or other life scientists together with researchers from data science in order to spur relevant future research in Vienna and beyond. As invited speaker, it features Sepp Hochreiter, head of the Institute of Bioinformatics at the Johannes Kepler University Linz.

One focus of his year's symposium is on machine learning, in particular deep learning, to analyze data in personalized medicine applications. Sepp Hochreiter is a pioneer in this field and, among others, the inventor of "Long Short Term Memory", a powerful algorithm to learn from long time series.

For more information of the research focus at CeMSIIS see cemsii.meduniwien.ac.at/ds4pm.

Invited Lecture: Deep Learning Revolutionizes Pharmaceutical Industry and Medicine (by Sepp Hochreiter)

Deep Learning has emerged as one of the most successful fields of machine learning and artificial intelligence with overwhelming success in industrial speech, language and vision benchmarks. Consequently it became the central field of research for IT giants like Google, Facebook, Microsoft, Baidu, and Amazon. Deep Learning is founded on novel neural network techniques, the recent availability of very fast computers, and massive data sets. In its core, Deep Learning discovers multiple levels of abstract representations of the input.

Deep Learning methods won the NIH Tox21 challenge organized by the US agencies NIH, EPA, and FDA, which was an unprecedented multi-million-dollar effort to test toxicity prediction methods. In early phases of drug design, pharma companies used Deep Learning to identify unknown side effects of drug candidates when given their chemical structure and data from bioassay measurement. Deep learning is currently applied to high content imaging, where biological effects are detected in images of cell lines to which a compound was added. We deploy Deep Neural Networks to toxicity and target prediction in collaboration with Janssen, Merck, Novartis, AstraZeneca, GSK, Bayer together with hardware-related companies like Intel, HP, NVIDIA and others.

Full agenda: Please see next page

Agenda – DS4PM Symposium 2018

10:30-10:40

The Research Focus Area DS4PM at CeMSIIS – an Update

Georg Dorffner, Section for Artificial Intelligence and Decision Support, CeMSIIS, Medical Univ. of Vienna

10:40-11:15

Invited Talk: Deep Learning Revolutionizes Pharmaceutical Industry and Medicine

Sepp Hochreiter, Institute of Bioinformatics, Johannes Kepler University Linz

11:15-11:35

Deep Bayesian Regression Models

Florian Frommlet, Section for Medical Statistics, CeMSIIS, Medical Univ. of Vienna

11:35-12:00 Coffee Break

12:00-12:20

OMICS Data Fusion for Precise Allocation of Therapy in Breast Cancer Patients

Wolfgang Schreiner, Section for Biosimulation and Bioinformatics, CeMSIIS, Medical Univ. of Vienna

12:20-12:40

Diagnosing Cardiac Amyloidosis from MRI using a Deep Learning Approach

Asan Agibetov, Section for Artificial Intelligence and Decision Support, CeMSIIS, and Medical Univ. of Vienna

12:40-13:00

Machine learning for Tissue Classification Using Methylation Analyses

Alexander Tolios, Department of Blood Group Serology and Transfusion Medicine, Medical University of Vienna

13:00-13:05

Announcements

Georg Dorffner, Section for Artificial Intelligence and Decision Support, CeMSIIS, Medical Univ. of Vienna

13:05-14:00

Snacks and Networking