MAX-PLANCK-INSTITUT
FÜR DYNAMIK KOMPLEXER
TECHNISCHER SYSTEME
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CSC Seminar

SPEAKER

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TITLE

A weighted Subspace Exponential Kernel for Support Tensor Machine

ABSTRACT

High-dimensional data in the form of tensors are challenging for kernel clas- sification methods. To both reduce the computational complexity and extract informative features, kernels based on low-rank tensor decompositions have been proposed. However, what decisive features of the tensors are exploited by these kernels is often unclear. In this talk, I would be presenting a proposed novel kernel that is based on the Tucker decomposition. For this kernel the Tucker factors are computed based on re-weighting of the Tucker matrices with tune- able powers of singular values from the HOSVD decomposition. This provides a mechanism to balance the contribution of the Tucker core and factors of the data. I benchmark support tensor machines with this kernel on several datasets. Firstly, I consider synthetic data where two classes differ in either Tucker factors or core. Then I compare our novel and certain existing kernels on real-world datasets. I show robustness of the new kernel with respect to both classification scenarios. The proposed kernel has demonstrated a higher test accuracy than the state-of-the-art tensor train multi-way multi-level kernel, and a significantly lower computational time.

Tuesday, May 23, 2023 at 2 pm
seminar room Prigogine