PhD research topic proposal

BME, Doctoral School of Mathematics and Computer Science

Name of supervisor :

Edith Alice Kovács

Degree:

PhD

Title of the topic:

Dealing with the curse of dimensionality: divide and conquer exploiting the stochastic dependency structure encoded by its Markov network

Short description:

Curse of dimensionality occurs in various domains of numerical analysis, machine learning, data mining and databases. When the dimensionality of the feature space increases, the volume of the space increases so fast that the available data become sparse. This sparsity is problematic from many point of views as follows. Statistical methods cannot assure statistical significance for their results; Many machine-learning algorithms use similarity or distance between objects, which become problematic in high dimensional spaces. The training of a model which uses high dimensional feature space needs an exponential large data set.

The candidate is supposed to do research on the existing dimensionality reduction methods and to give new method for breaking down the high dimension feature space into meaningful low dimensional feature spaces and illustrate the benefit of this decomposition in different machine-learning tasks.

Requirements:

An introductory course to data science, algebra, probability theory

Contact:

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Place of work:

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