

Cognitive Science Seminar

Thursday, Jan. 23rd (17:00), Institute of Psychology, 6 Ingardena St., room 2.15

Dr. Jarosław Duda

(Institute of Computer Science and Computer Mathematics, Jagiellonian University)

Analysis of higher mixed moments and modelling conditional distributions

We are used to (Spearman) correlation coefficients, which can be seen as '11' mixed moments – they describe dependence between expected values of two variables. We can analogously calculate higher mixed moments, e.g. '22' describes dependence between their variances, or asymmetric: '12' describes value-variance dependence - its asymmetry might suggest some directionality. I will talk about novel approach which allows to inexpensively estimate such mixed moments from data, also their time evolution for non-stationary time series, then they directly provide model of joint probability distribution based on such found mixed moments. Beside higher order description of statistical dependencies and their dynamics, it allows to directly predict conditional probability distributions – e.g. providing inexpensive model of artificial neuron: directly learning and exploiting statistical dependencies of its connections.