Tensor Product Kernels: Characteristic Property and Universality*

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Abstract

Maximum mean discrepancy (MMD) and Hilbert-Schmidt independence criterion (HSIC) are among the most popular and successful approaches in applied mathematics to measure the difference and the independence of random variables, respectively. Thanks to their kernel-based foundations, MMD and HSIC are applicable on a large variety of domains such as documents, images, trees, graphs, time series, dynamical systems, sets or permutations. Despite their tremendous practical success, quite little is known about when HSIC characterizes independence and MMD with tensor kernel can discriminate probability distributions, in terms of the contributing kernel components. In this talk, I am going to provide a complete answer to this question, with conditions which are often easy to verify in practice.

- Preprint: `https://arxiv.org/abs/1708.08157`
- ITE toolbox (estimators): `https://bitbucket.org/szzoli/ite-in-python/`

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