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## [ML] Multidimensional transfer functions & fake rates with neural networks

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Fake leptons are important backgrounds in many analyses and known for being hard to control. Commonly, background estimations through fake rates introduce several shortcomings due to necessary binning of inputs and a limited number of input parameters. In particular, fake rates in searches for long-lived particles might strongly depend on displacement and other secondary vertex properties.

Practically speaking, one can think of fake rates as multidimensional transfer functions which can be approximated via neural networks.

In this talk a way of fitting fake rates with the help of neural networks is presented. The method is showcased in the context of fake lepton backgrounds for a long-lived heavy neutrino analysis exploiting multiple fake rate dependencies.

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