

# Industrial PhD

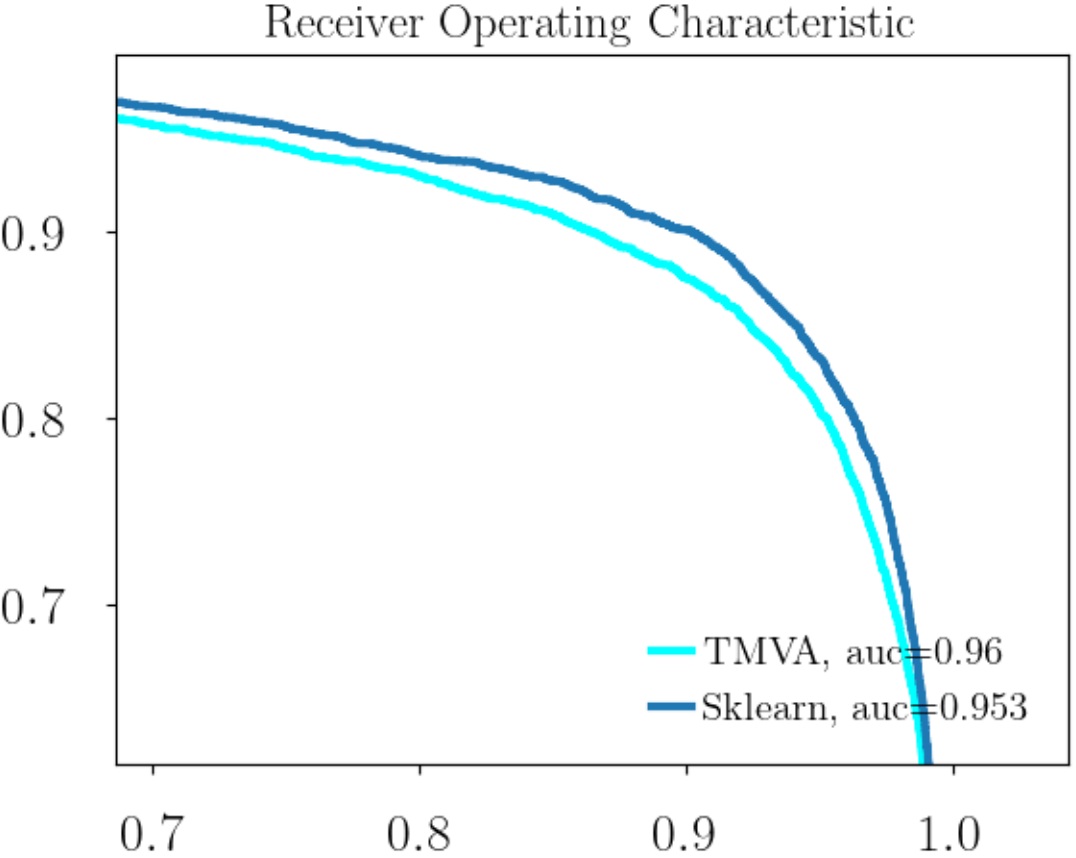
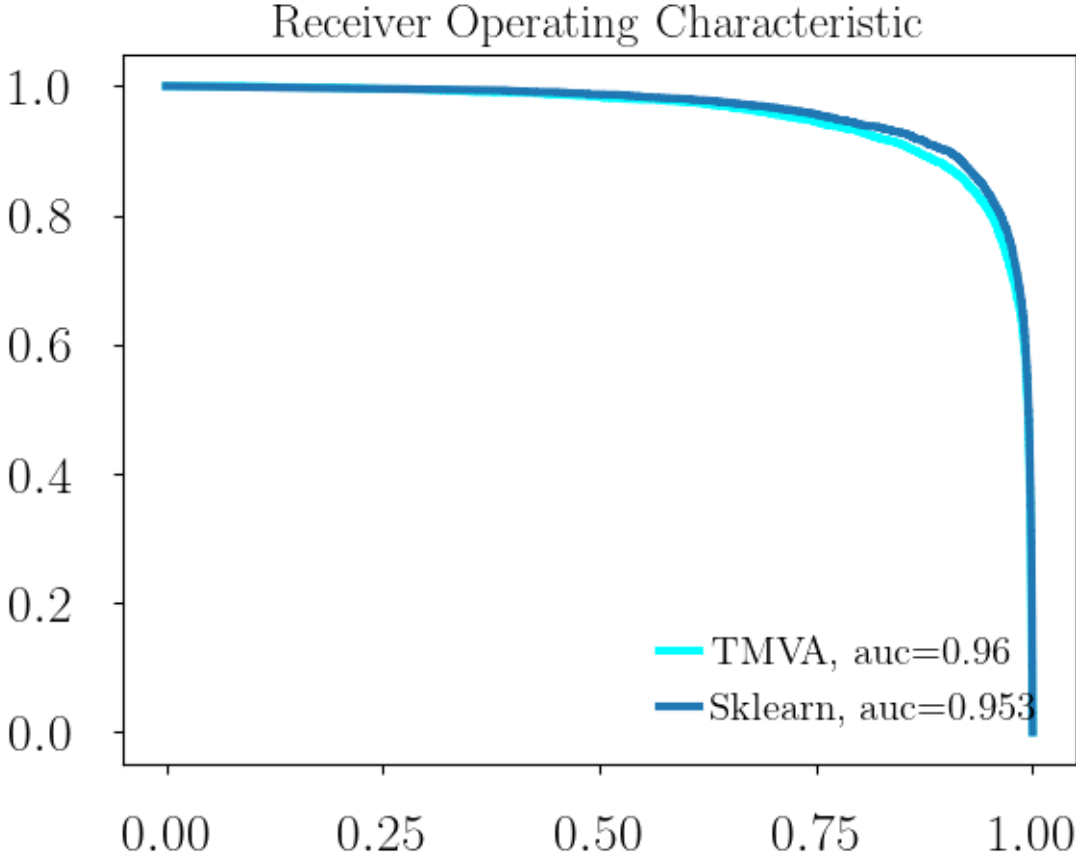
*New applications for machine learning and transfer learning algorithms in the manufacturing industry and in particle physics.*

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# TMVA VS. SKLEARN

$B \rightarrow \mu\mu$



# Analysis of machine learning techniques

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- $B \rightarrow \mu \mu$ ,  $B \rightarrow \pi\pi$ ,  $B \rightarrow 2\pi$ ,  $B \rightarrow 3\pi$ ,  $B \rightarrow 4\pi$
- Using Pytorch, Keras and Scikit Learn
- Low stats and High stats, using 60% of the dataset vs. all

## All features:

- PT B
- PT  $\mu_1$
- PT  $\mu_2$
- Isolation  $\mu_1$
- Isolation  $\mu_2$
- IP B
- IP  $\mu$
- DOCA
- DoF
- Position of muons
- Position of mothers

## High level:

- PT B
- PT  $\mu_1$
- PT  $\mu_2$
- Isolation  $\mu_1$
- Isolation  $\mu_2$
- IP B
- IP  $\mu$
- DOCA
- DoF

## Low level:

- PT B
- PT  $\mu_1$
- PT  $\mu_2$
- Isolation  $\mu_1$
- Isolation  $\mu_2$
- Position of muons
- Position of mothers

# Analysis of machine learning techniques

