

## Active Learning for Exclusion level set estimation with the ATLAS experiment

*Monday, July 12, 2021 3:30 PM (15 minutes)*

Excursion is a tool to efficiently estimate level sets of computationally expensive black box functions using Active Learning. Excursion uses a Gaussian Process Regression as a surrogate model for the black box function. It queries the target function (black box) iteratively in order to increase the available information regarding the desired level sets. We implement Excursion using GPyTorch which provides state-of-the-art fast posterior fitting techniques and takes advantage of GPUs to scale computations to higher dimensions.

In this talk, we demonstrate that Excursion significantly outperforms traditional grid search approaches and we will detail the current work in progress on improving Exotics searches as an intermediate step towards the ATLAS Run 2 pMSSM scan on  $pp$  collisions at  $\sqrt{s} = 13$  TeV with the ATLAS detector.

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No

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