

Third MODE Workshop on Differentiable Programming for Experiment Design



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The GENETIS Project: optimizing detector designs for science outcomes

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The GENETIS project aims to optimize detector designs for science outcomes. The interdisciplinary team brings a particular expertise in radio applications. This student-driven project started in 2018, is so far optimizing antennas for both the Askaryan Radio Array (ARA) and PUEO experiments for the highest number of detections of astrophysical neutrinos via Askaryan radio emission from interactions in Antarctic ice. So far, we have used genetic algorithms for optimizations, which improve designs using principles based on biological evolution. The framework developed by GENETIS is now capable of evolving the designs of other detectors, whether or not they are based in radio techniques. I will introduce the GENETIS project, present first results, and discuss our plans for the future.

Author: CONNOLLY, Amy (The Ohio State University)

Presenter: CONNOLLY, Amy (The Ohio State University)

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