

## AI-assisted Tracking Algorithm

*Wednesday, 2 December 2020 15:00 (8 minutes)*

In this work we describe the development of machine learning models to assist the CLAS12 detector tracking algorithm. Several networks were implemented to assist tracking algorithm to overcome drift chambers inefficiencies using auto-encoders to de-noise wire chamber signals and corruption detection. A classifier network was used to identify track candidates from numerous combinatorial segments using different types of networks including: Convolutional Neural Networks (CNN), Multi-Layer Perceptron (MLP) and Extremely Randomized Trees (ERT). The final implementation provided an accuracy >99%. The implementation of AI assisted tracking into the CLAS12 reconstruction workflow and provided code speedup of up to 4 times.

**Primary author:** GAVALIAN, Gagik (Jefferson Lab)

**Presenter:** GAVALIAN, Gagik (Jefferson Lab)