Applying Machine Learning To Particle Detectors

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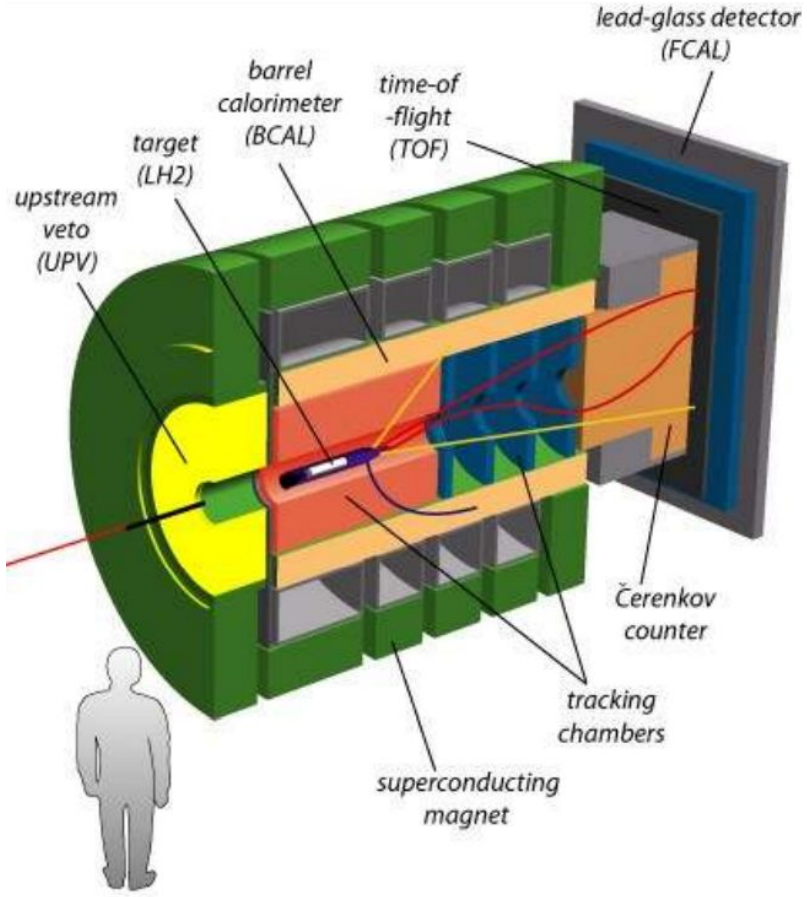
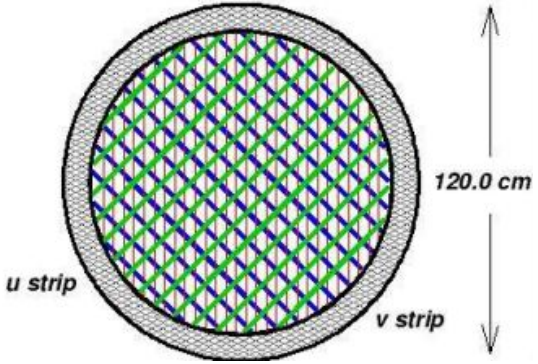
Problem

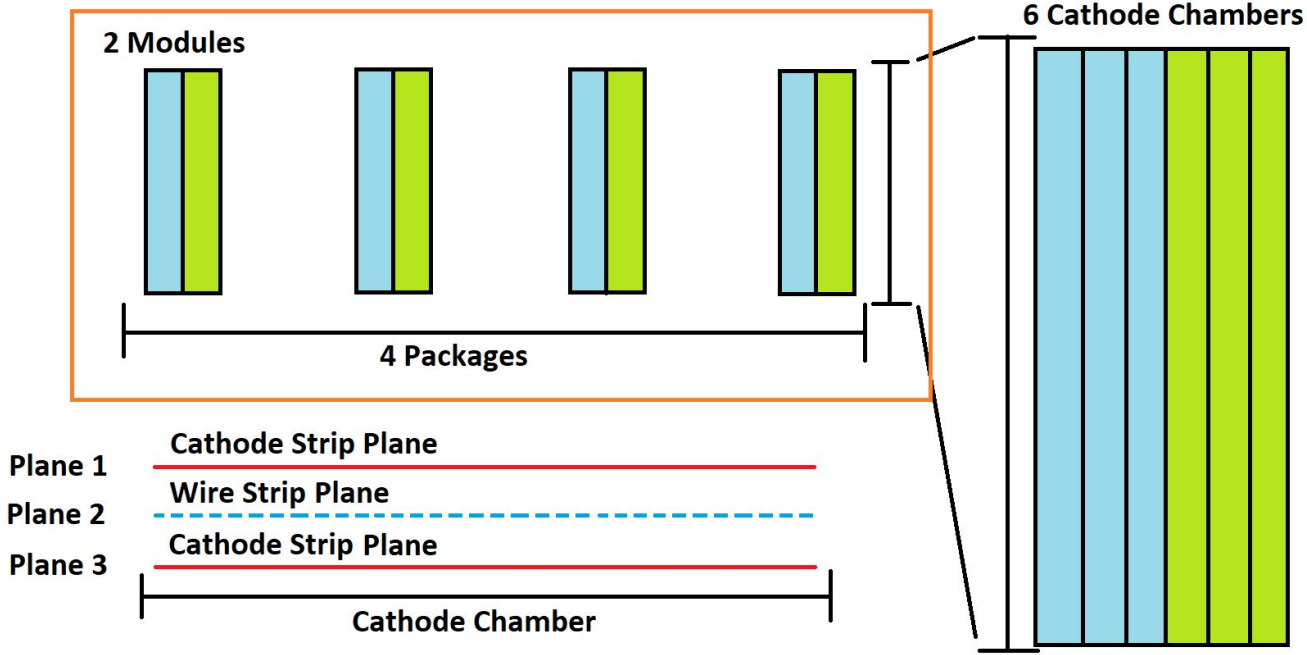
- Particle Detectors Produce a lot of Data
- Reconstructions are computationally Expensive
- Explore Applications in the GlueX detector



What is the FDC

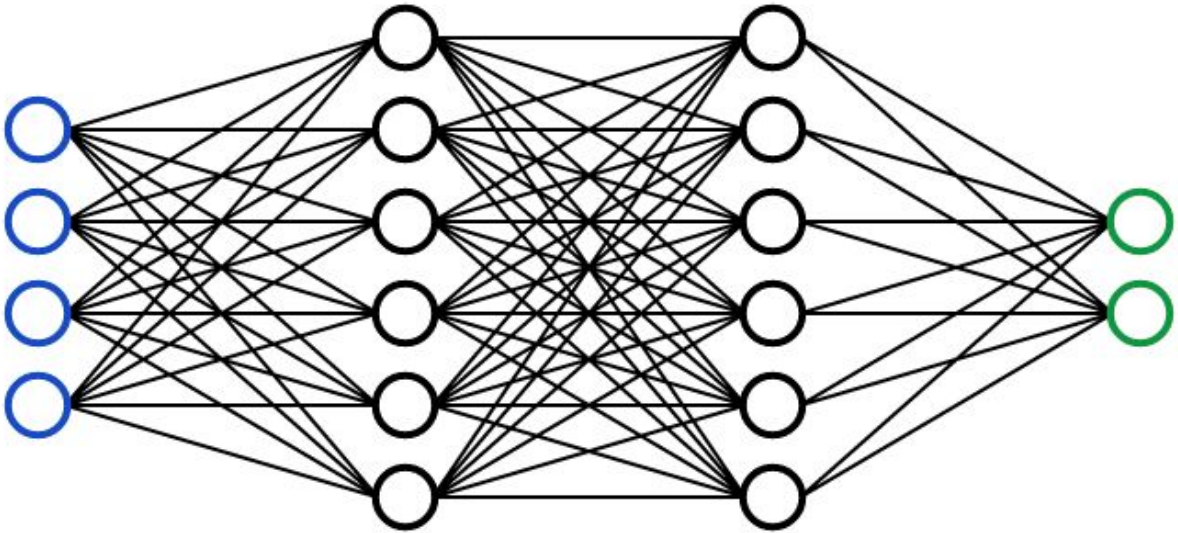
- Forward Drift Chamber





Why use a neural network

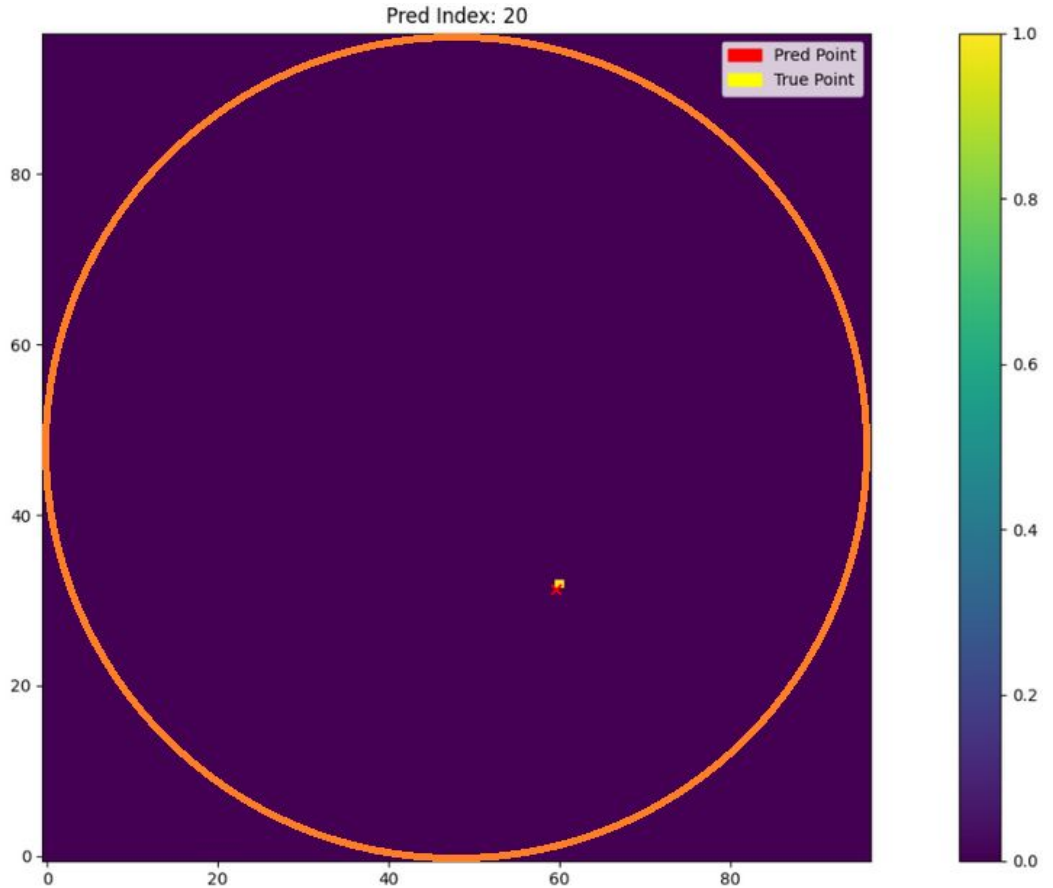
- Raw data
- Trained model provides good performance



Data

- Simulated data

- Particle hit positions



Future Updates

- Multiple Particles

- Higher Level Properties

Acknowledgements

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- I would like to acknowledge my project supervisor, Professor Richard Jones, who help me as I learned about both the GlueX detector and neural networks.

My project explores the use of machine learning applied to data from the GlueX particle detector. Over the course of my project I implemented a neural network capable of identifying where a particle hit the detector given raw input from the detector.