

Project Description - Advanced Tracking Algorithms using the ATLAS Pixel Detector

The pattern recognition algorithms currently in use by the atlas experiment utilize only a fraction of the information produced by the inner detector that could be useful in reconstructing tracks with the highest purity and efficiency. In particular, the cell geometry and excellent charge calibration of the pixel detector provide extra constraints on the correct association of hits with track candidates that are completely ignored by current tracking algorithms.

The goal of this project is to investigate the use of detailed information about the charge distributions within pixel clusters to provide improved and more flexible pattern recognition for charged particles in ATLAS. The first task is the study of correlations between the attributes of tracks and the characteristics of the hits they produce in the pixel detector using readily available datasets.

Please contact [Tim Nelson](#) for more information regarding this project.