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Machine learning techniques for track analysis in Active-Target Time Projection Chamber data[1] LEXANNE WEGHORN, University of Wisconsin - La Crosse, MICHELLE KUCHERA, RAGHU RAMANUJAN, Davidson College, MORTEN HJORTH-JENSEN, DANIEL BAZIN, YASSID AYYAD, National Superconducting Cyclotron Laboratory — The ^{22}Mg(α, p)^{25}Al reaction rate is an important reaction in the study of Type-I X-ray bursts. The Active-Target Time Projection Chamber (AT-TPC) was used to study this reaction at the National Superconducting Cyclotron Laboratory. Classifying the reaction types for each event of this experiment proved extremely challenging due to experimental conditions and algorithmic limitations. This work proposes the use of machine learning techniques as a method for determining the number of reaction products in a single event. This can act as the first step in classifying reaction types in this experiment. Both fully connected neural networks (FCNNs) and convolutional neural networks (CNNs) were explored to motivate their use for analysis of the data. Preliminary results with simulated data indicated that FCNNs and CNNs can both predict the number of reaction products in an event. These results will be presented and discussed.

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