Investigating the Use of Omnifold in Unfolding Jet Transverse Momenta Spectra

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A common issue in experimental particle physics is the presence of detector effects that distort the information measured by the detector, e.g., finite resolution smearing energy and momentum measurements. Thus, it is necessary to create and implement techniques that correct for the detector effects. These effects become especially challenging when the underlying spectra are steeply falling, e.g., momentum distributions of hadrons within jets. Iterative Bayesian Unfolding (IBU) is a well-established technique, using properties of Bayesian statistics to predict the true particle data based on the detector data. IBU requires binning the data, but Omnifold, a new algorithm created in 2020, implements a machine learning approach that enables IBU event-by-event. We train a Keras classifier on fast Monte Carlo data, which we generate using functional distributions to simulate the steeply falling true spectra and the smearing from detector responses of the STAR detector at RHIC. In this study, we investigate the ability of Omnifold to recover the true distributions from different starting assumptions. This is relevant for measurements such as the distributions of hadrons within jets in the STAR 2017 510 GeV p+p data set. A status report will be presented.