

Abstract Submitted
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Self Organizing Maps for use in Deep Inelastic Scattering EVAN

ASKANAZI, University fo Virginia — Self Organizing Maps are a type of artificial neural network that has been proven to be particularly useful in solving complex problems in neural biology, engineering, robotics and physics. We are attempting to use the Self Organizing Map to solve problems and probe phenomenological patterns in subatomic physics, specifically in Deep Inelastic Scattering (DIS). In DIS there is a cross section in electron hadron scattering that is dependent on the momentum fraction x of the partons in the hadron and the momentum transfer of the virtual photon exchanged. There is a soft cross part of this cross section that currently can only be found through experimentation; this soft part is comprised of Structure Functions which in turn are comprised of the Parton Distribution Functions (PDFs). We aim to use the Self Organizing Process, or SOP, to take theoretical models of these PDFs and fit it to the previous, known data. The SOP will also be used to probe the behavior of the PDFs in particular at large x values, in order to observe how they congregate. The ability of the SOP to take multidimensional data and convert it into two dimensional output is anticipated to be particularly useful in achieving this aim.

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