Contribution ID: **105** Type: **Flashtalk with Poster**

Generating Lagrangians for particle theories

Tuesday, 30 April 2024 18:05 (3 minutes)

We report progress in using transformer models to generate particle theory Lagrangians. By treating Lagrangians as complex, rule-based constructs similar to linguistic expressions, we employ transformer architectures —proven in language processing tasks— to model and predict Lagrangians. A dedicated dataset, which includes the Standard Model and a variety of its extensions featuring various scalar and fermionic extensions, was utilized to train our transformer model from the ground up. The resulting model hopes to demonstrate initial capabilities reminiscent of large language models, including pattern recognition and the generation of consistent physical theories. The ultimate goal of this initiative is to establish an AI system capable of formulating theoretical explanations for experimental observations, a significant step towards integrating artificial intelligence into the iterative process of theoretical physics.

Primary authors: Dr CAMARGO-MOLINA, Eliel (Uppsala University); KOAY, Yong Sheng (Uppsala University)

Presenter: Dr CAMARGO-MOLINA, Eliel (Uppsala University)

Session Classification: 3.2 Physics-informed AI & Integration of physics and ML

Track Classification: Session B