# Project Details

**ROSES ID:** NNH21ZDA001N-LWSTM
**Selection Year:** 2021
**Program Element:** Data, Tools, & Methods

**Project Title:**
Using Machine Learning to Detect and Build CME Datasets for Heliophysics

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**Summary:**
Using Machine Learning to Detect and Build CME Datasets for Heliophysics

We plan to develop a Machine Learning (ML) based solution to identify physical properties of coronal mass ejections (CME). Our approach will provide a long baseline catalog of CME detections for SOHO with derived properties which we can use to better understand the population of CME relative to solar cycle and other physical phenomena. An ML-created catalog solves weaknesses found in other automated catalogs and in manual catalogs. In addition to this catalog of CME events we will also provide the ML models which encapsulate SME expertise for identifying CME. These may be utilized to better detect CME for space weather forecasting and to compare observational data with numerical models and thereby serve to better quantify simulation performance and sidestep human bias in comparison. To perform this work we will utilize computer vision, a field of artificial intelligence that trains computers to interpret and understand images.

We will supply these derived events as a VOEvent formatted file to the Solar Data Analysis Center (SDAC) on or by May 2023. ML models based on YOLO computer vision algorithm and the associated python code for creating and running them will be released as open software on the NASA GitHub (https://github.com/nasa/).

# Publication References:

no references