



CPS: Small: Mitigating Uncertainties in Computer Numerical Control (CNC) as a Cloud Service using Data-Driven Transfer Learning/1931950/August 2019/University of Michigan/PI: Okwudire; Co-PI: Kontar

Challenge:

- Computer numeric control (CNC) is currently run locally
- Moving CNC to the cloud could significantly improve its performance but this introduces uncertainties due to network reliability

Solution:

- We propose the use of transfer learning to foresee impending faults and take corrective actions via switching to a safe state



Scientific Impact:

- Predicting failure events from a combination of condition monitoring and past failure data
- Calibrating physics-based models with functional parameters from condition monitoring data

Broader Impact:

- New educational curriculum at to increase the U.S. talent pool in cybermanufacturing and data analytics
- Outreach to middle schoolers in Detroit using demonstration of transfer learning on a CPS

Contact: Okwudire@umich.edu