IPRO 304

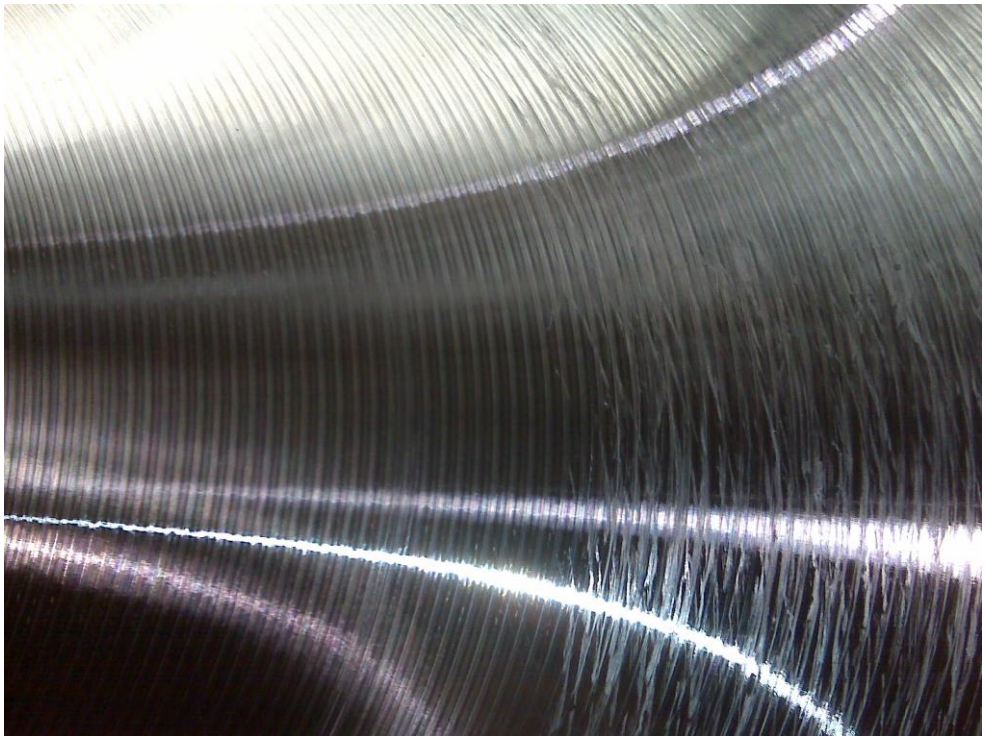
Integration of Process Improvements

Sponsor: A. Finkl and Sons

Presenters:
Ricardo Rodriguez
Corey Hawker
Ryan Marx
Emmanuel Flores

Problem Statement

Broken carbide inserts from machining steel incur major economic and productivity losses in the company. Non-uniform surface finish casts doubt about steel's quality.



Project Goals

- Experiment with the Reproduction of Last Semester's Data
- Investigate the Feasibility of Insert Isolation
- Investigate Parameters for Detection of Broken Inserts
- Explore Possibility of Insert Failure Prediction for Defined Parameter Sets
- Attempt to Create Insert Failure Detection System

Team Organization

- Mechanical Testing Team
  - Emmanuel Flores (Material Science and Engineering)
  - Corey Hawker (Computer Science)
  - Richard Pollak (Mechanical, Materials, and Aerospace Engineering)
  - Ricardo Rodriguez (Chemistry/Chemical Engineering)
  - Joshua Willett (Aerospace Engineering)
- Analysis Team
  - Charles Loeppert (Mechanical Engineering)
  - Ryan Marx (Computer Science/Computer Engineering)
  - Ricardo Rodriguez (Chemistry/Chemical Engineering)
  - David Snyder (Materials Science and Engineering)
  - Stefan Stevanovic (Mechanical Engineering)
  - Joshua Willett (Aerospace Engineering)

Progress Towards Goals

- Professional LabView Expertise
- Installed Tachometer
- Begun Initial Data Collection with Tachometer Input
- Exploring Data Collected from Tri-Axis Accelerometers

Major Obstacles

- Learning Previous Work
- Obtaining Tachometer
- Movement and Installation of HAAS CNC Machine
- Initial Use of LabView
- Obtaining Electronic Schematic for HAAS CNC Machine

Anticipated Challenges

- Analyzing Data
- Synchronizing Cutting Inserts with Observed Signal Profile
- Creating Cutting Insert Failure in IIT Lab Setting
- Applying IIT Lab Data to Finkl Environment
- Reorganizing the Team Structure

Needs/Questions/Requests

- Needs
  - Finkl to Acquire and Install Tachometer
  - HAAS CNC Electronic Schematic