Spring 2006 Midterm Progress Report

IPRO 331

Team Members

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Revised Objectives

The objectives have not changed since the project plan. The purpose of this IPRO is to develop a system to automatically detect a problem with a mill at A. Finkl & Sons Co. The system will either turn the mill off or warn the operator when a tooth breaks, or some other irregularity occurs. This system will involve measuring vibration, sound, power, or some combination of these variables. This will replace the current setup, which involves an operator remaining in close proximity to the mill at all times in order to turn it off when a tooth breaks or any other irregularity occurs.

Results to Date

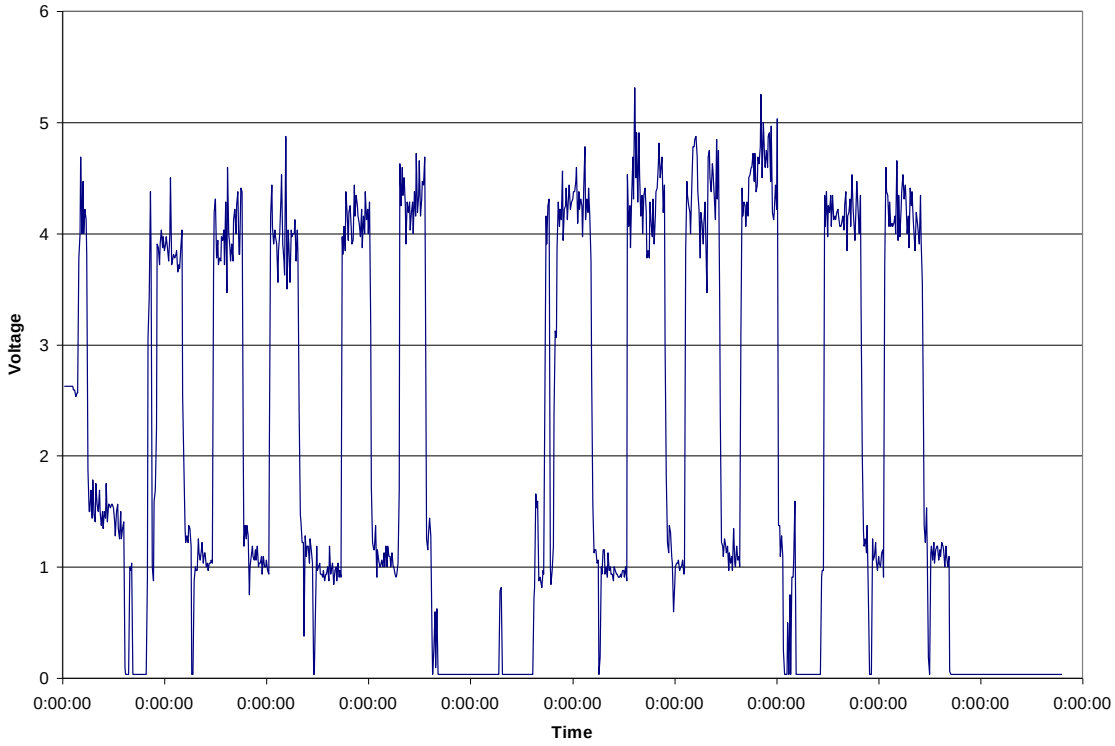
The first task was to research existing technologies and methods of automating mill monitoring. In addition to speaking with Dr. Chen at IIT, several key articles were discovered and each of the team members is now familiar with them. In addition, extensive research was conducted to determine which microphone and power meter would be suitable for our purposed. Finkl was informed of the web cam, microphone, and power meter that will satisfy our needs, and approved them. They are now in the process of purchasing them.

The entire class took a trip to Finkl to both better understand the problem, and to learn the necessary information to solve the problem.

A vibrameter was mounted on the mill at the machine shop in E1 at IIT. Reasonable data was acquired, which suggests the vibrameter is a valid method to use at Finkl.

At the beginning of the project, the mill was not operational, nor was the existing vibrameter. Once the mill was being used again, two members of the team took an additional trip to Finkl and set up the vibrameter. Preliminary data is now being obtained,

but parameters still need to be adjusted. Most importantly, the sampling rate must be increased, and this is currently being investigated. An example of the preliminary data is shown in Graph 1.



Graph 1: Preliminary Vibrameter Data from Finkl

Revised Schedule

Task	**Dates**
Order microphone	3/10/2006
Order power meter	3/24/2006
Increase sampling rate of vibrameter	3/24/2006
Data acquisition	3/27/2006 - 4/28/2006
Data analysis	3/27/2006-4/28/2006
Implement broken tooth detection software	4/17/2006 – 4/28/2006

Changes in timeline are primarily due to the unresponsiveness of Finkl. Multiple attempts of contact, through e-mail and phone, by many in the IPRO group to a many persons at Finkl have been tried, and still it is difficult to get the necessary questions answered and tasks completed.

Updated Assignments

Power Meter Research
Leland Barnard
Vitaliy Kunin
Craig Cahan

Microphone Research
Kyoung-min Min
Sung Song
Daniel Sanchez

General Research
All team members

Data acquisition
Kyoung-min Min
Jose Contreras Vega

Website
Matthew Matute

Finkl Contact
Christopher Lee

Obstacles

Progress has been hampered by the uncooperativeness of those at Finkl. At times, there were several weeks before questions were answered. In addition, they said many times they would get the vibrameter working, which they have not yet to date. Two members of the IPRO finally went to Finkl and set it up themselves. But, the barriers will persist in the upcoming weeks for the revised schedule unless more active cooperation is taken by the people at Finkl.