Vision Based Remote Monitoring of Trackside Friction Control Systems

Status: Filled

Group Members: Ali Mahinpoor, Soheil Mahinpoor, Stephan Rayner, Nicholas Yu

Sponsor(s): LB Foster Rail Technologies Ltd.

Supervisor(s): Kevin Oldknow, PhD, Lecturer, Mechatronic Systems Engineering, Principal Engineer, Wheel/Rail Interface
Glen Appleby, Senior Manager, Trackside Systems Engineering

Project Description

LB Foster Rail Technologies provides wheel / rail interface technology solutions to the global freight and passenger rail industries. Included in the product portfolio is the “PROTECTOR® IV” (PIV) trackside friction control system, which applies KELTRACK® friction modifier to manage friction at the top-of-rail / wheel tread interface, as well as standard lubricants to the gauge face / wheel flange interface. The PIV system is installed adjacent to the right-of-way in revenue service (often in remote locations with little or no road vehicle access). A combined RF/GPRS based Remote Performance Monitoring (RPM) system is used in conjunction with a web-based

- Thorough review and analysis of available technologies for use in the vision-based application, including an assessment of readiness for implementation in the (extremely harsh) railroading environment.
- Review of power requirements and energy balance to allow for feasible use in conjunction with existing systems (typically solar-based, i.e. limited power availability)
- Analysis of mechanical design requirements including enclosure(s), linkage(s) and any motion control requirements for the system to operate effectively. Again the emphasis will be on readiness for implementation in the railroading environment.
- Analysis of system-integration requirements, allowing vision data to be transmitted and integrated into the overall database and web-interface.
- Design and implementation of a working prototype, including data transmission and integrated web presentation.

It is required that students enter into non-disclosure/non-compete and Intellectual Property assignment agreements with L.B. Foster Rail Technologies to participate in this project (agreements to be reviewed by Capstone instructors). Students will be able to present and demonstrate the outcomes of the project, consistent with the requirements of the Capstone program, however all presentation materials must be reviewed by L.B. Foster Rail Technologies prior to disclosure, with editorial license to ensure that confidential information is not disclosed.