Poster paper

Race car racing characteristics

Ashley Benson, Sachin Rao, Rachel McLean and Jason Reid **Samuel Mann**

Department of Information Technology and Electrotechnology
Otago Polytechnic, Dunedin, NZ
smann@tekotago.ac.nz

In all racing applications, the collection of data and its analysis provides an invaluable tool for setup, maintenance and performance enhancements of a racing vehicle. This is no different for Revolution Technologies at Otago Polytechnic. This year, Wallace Racing Ltd utilises a VY Holden Commodore 2004 to compete in the New Zealand V8 Touring Cars Championship. Most of the strategic decisions are made based upon the team's prior experience and assessment of the current conditions. Our objective was to devise a solution that would enable the pit crew to make an informed decision with the use of new computer technology.

The main goal was to design, test and implement a data acquisition system to be mounted on the car during test sessions and not during actual racing. This system has the ability to monitor multiple sensors mounted on the car than measure its performance. The data gathered from these sensors is stored on the system itself, in non-volatile memory and can later be downloaded to a computer for analysis. This system will allow the pit crew to accurately analyse the performance of the car and driver. It will increase the effectiveness of any improvements made to the car.

The opportunity that was identified with the client, was to provide a solution for their ongoing need to constantly test their race car and its settings. Wallace Racing Ltd. needs to obtain testing data to determine if changes to the car's settings have a positive or negative impact on performance.

To provide the client with the data they require we developed a two-part system. The first of the system consists of a hardware aspect. For this we have a development board connected to sensors mounted in the car as well as a Global Positioning System (GPS) unit. The development board takes readings from the sensors and the GPS unit and stores them in non-volatile memory on the development board.

The second part of our complete system is a custom-built software application for data analysis. This application will transfer data from the development board and store it in a text field for reference. The application can retrieve any previous data from the database and display this in a graphical format for easy analysis. This also includes a moving representation of where the car is located around the track - achieved using GPS readings.