

## **Advanced Dynamic Vehicle Simulation**

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The Motorsports Engineering Program within the Purdue School of Engineering and Technology at Indiana University-Purdue University, Indianapolis (IUPUI) has partnered with Dallara Automobili to conduct basic and applied research involving dynamic vehicle simulation to advance motorsports engineering techniques and motorsports related economic development opportunities for the State of Indiana and beyond. The project includes completion and operation of the world's most advanced vehicle dynamic simulator at Dallara's IndyCar facility in Speedway, Indiana. This facility supports assembly of the racecars used for the IZOD IndyCar series, America's foremost open-wheel racing series.

The basic and applied research to be conducted by IUPUI using the advanced vehicle dynamic simulator at Dallara, includes the following aims:

- i) Correlation of empirical simulator data to both track-test empirical data and driver qualitative feedback;
- ii) Correlation of driver head and chest acceleration data between corresponding simulator and track-test situations; and
- iii) Extend simulator capabilities to other applications, including short track stock cars, sprint cars, etc., by developing new physics models to simulate appropriate track conditions.