

## Project Name Intelligent Ground Vehicle

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The Intelligent Ground Vehicle Competition (IGVC) challenges students and researchers to develop innovative autonomous vehicles capable of comprehending and completing complex, random courses. In conjunction with Florida State University (FSU), Florida Institute of Technology IGVC (FIT IGVC) has developed a robot for this year's competition, as well as a long-term baseline for further development. FIT IGVC's contributions include GPU based lane detection extendable to obstacle detection, a light-weight motion planning and mapping tool, remote control seamlessly interfaced with programmatic control, and a flexible communication framework supporting software in multiple languages across multiple devices. FSU focused on fabrication, motor control, position estimation, and obstacle detection. Both schools collaborated on mechanical design and power requirements. Hardware and software selection for the robot focused on novel hardware and techniques, including the NVIDIA Jetson TX1, the ZED Stereoscopic camera, Sampling Based Model Predictive Optimization (SBMPO), and RabbitMQ. Other technologies used include OpenCV, ROS, D\* Lite, and the VectorNav 200 INS. Integration of various components will continue until the competition in June. In summary, we have developed software components compatible with a unique hardware configuration, which is innovative, extendable, and capable of competing.

