



Josh graduated from Purdue in 2010 with a BS in ABE. As an undergrad, he was involved in concrete canoe, FIRST robotics, and ASABE. He helped design and build a basic utility vehicle for Cameroon as part of senior design. During his graduate studies, he served as a social chair for ABE GSA and volunteered with CVN. After Purdue, Josh will begin work as an Application Engineer at Cummins in Columbus, IN.



# Agricultural & Biological ENGINEERING

## Thesis Defense

**Speaker:** Josh Heber

**Title:** Instrumented Infinitely Variable Transmission

**Major Professor(s):** Dennis Buckmaster

**Date:** Thursday, June 30, 2011

**Time:** 2 PM

**Location:** ABE 301

### Abstract:

An infinitely variable transmission (IVT) for instructional purposes was designed and built. The type of IVT constructed was an input coupled power split transmission with a hydrostatic transmission used as the variable unit. Components for the IVT have been chosen based on creating a model to teach students the function and operating characteristics of an IVT. The IVT was constructed on a wheeled cart to provide mobility. Visibility was a key to determine placement of components. The IVT cart was built to connect to a dynamometer for output power, torque, and speed measurement. The IVT was instrumented so that input torque and speed as well as hydraulic oil pressures, temperature, and pump swash plate position were monitored. The displacement of the hydrostatic transmission is controlled by a stepper motor. Through a controller area network system, all variables and parameters can be displayed; with a personal computer connected, data logging can be accomplished easily. Example laboratory handouts were created to streamline instruction and assess comprehension of presented and illustrated concepts.

### Application:

The IVT will be used as a laboratory training device for ASM 345/ABE545 (Off Road Vehicle Design), ABE 435 (Hydraulics), and ABE 460 (Sensors and Controls)