Center for Advanced Vehicular Systems (CAVS) Overview

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CAVS

- full-time operation December 2003
- Nissan initiated – MSU administered
- three buildings, about 220 people
  - Research in Starkville
  - Extension in Canton
- research to commercialization
- funding (about 40 contracts at a time)
  - several large federal contracts
  - core state appropriation ($3.9 million per year)
  - industrial projects (about half)
Mission

CAVS is an interdisciplinary center in the Bagley College of Engineering at Mississippi State University.

CAVS provides engineering, research, development, and technology transfer teams focused on complex problems, such as those encountered in technologies designed to improve human mobility.
Character of CAVS in a Few Words

- complex
- technical
- interdisciplinary
- competitive
- niches
- sustainable

Examples –

- 12% of Particulate Materials Conference
- best performing hybrid vehicle Challenge X
- top funding in Computational Mechanics in USA
Facilities
Research
Testing
Why Auto?

- many opportunities
- USA leads world
- Southern Automotive Corridor
  - 37 assembly plants in Midwest
  - 27 assembly plants in South
- need for ideas, people, data, knowledge
Benefits

- products
- companies
- education
- knowledge
- jobs
People

- 100 students
- 18 postdoctoral fellows
- 42 faculty (12 departments)
- 74 staff
- 2 visiting professors per year
Trajectory
Cluster Concept

- administrative groups
  - human and systems engineering
  - computational manufacturing and design
  - alternative power systems
  - hybrid vehicle design: Challenge X
  - materials processing
  - advanced learning technologies
  - testing and characterization
  - ...

- team assembly across clusters
Cooperative Computing

Smoke and Fire Simulation first qualified by US Navy
Advanced Learning Technologies

InSite Suite v 2.0
new authoring software for e-learning, business
Hybrid Vehicle Design

Challenge X through the road hybrid next step plug-in hybrid?
Power (Auto) Electronics

SemiSouth silicon carbide in 600 V 600 A modules
International Exchanges

students in Spain
visiting professors from Turkey, Korea, Florida
Virtual Technologies
Plant Design
Law Enforcement
Human Factors
Materials Processing
Vehicle Electronics
Computational Manufacturing and Design
Rapid Prototyping
The Bottom Line