The Latest on Russ College Research

Research at the Russ College is as varied as it is dynamic.
Here's a snapshot of what's going on in the College's research units.

Avionics Engineering Center

Avionics is working with LORAN (Long Range Navigation), a legacy position, navigation, and timing system that typically has been error-prone in its position-solution performance. The center is studying the use of H-field aircraft antennas to mitigate precipitation static build-up on aircraft, which results in loss of navigation. LORAN is being considered as a backup navigation system to GPS for general aviation aircraft.

Center for Advanced Materials Processing

A patent has been granted for a new CAMP-developed electrostatic precipitator that is based on the principle of a sieve. In the invention, fly-ash particles are removed from combustion gases by passing them through a high-voltage screen. Funded by the Ohio Coal Development Office, the precipitator has generated great interest in the power industry, and a consortium has been formed to commercialize the concept. A pilot-scale test unit being built at American Electric Power's plant in Conesville, Ohio, will enable students and faculty to assist in testing the new technology.

Center for Advanced Software Systems Integration

Engineers at the Center for Advanced Software Systems Integration (CASSI) continue to develop cost-estimation software for jet engines at General Electric Aviation. Previously completed work is now being used daily by GE's preliminary design engineers. Over the past two years, CASSI engineers have expanded their methodologies beyond the original 13 engine part families. Because many metal engine parts will be replaced with composite materials in the future in order to make new engines lighter, CASSI is helping GE create a program to estimate the cost effect of the changeover.
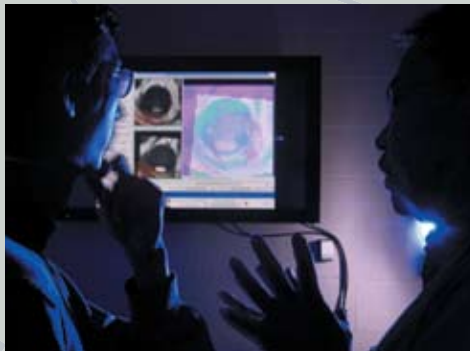
CIDDS researchers discuss their medical imaging software.

Center for Air Quality

The Center for Air Quality is evaluating the sources, transport, deposition, and influence of mercury on human health and the environment in the Great Lakes Basin. The center also is working with the Department of Economics to model the overall economic effect of ozone regulations on the state and teaming up with the Ohio Manufacturers Association to develop cost-effective control measures for reducing particulate matter and ozone concentrations within the state.

Center for Automatic Identification

The Center for Automatic Identification is researching the effects of integrating radio frequency identification (RFID) into highly automated environments in order to help develop a roadmap for RFID users implementing the technology in current manufacturing and processing facilities. While the effects of various products and materials have been studied, the center is analyzing RFID readers in close proximity to items that tend to emit frequent and potentially high levels of electro-magnetic interference.

Center for Intelligent, Distributed and Dependable Systems (CIDDS)

CIDDS is developing two projects in its Medical Image Analysis Lab. In its segmentation-guided image registration for brain atrophy analysis and brain atlas construction, CIDDS is using a model that can naturally handle non-rigid as well as rigid deformation. CIDDS is using this image registration technique to model respiratory motion in lungs for radiation treatment and dose delivery.

Institute for Corrosion and Multiphase Technology

In the multiphase transport of oil/water/gas mixtures through long carbon steel pipelines, internal corrosion happens only when the water contacts the pipe wall. The Institute for Corrosion and Multiphase Technology is researching the conditions that lead to water-wetting of internal pipeline surfaces and the resulting corrosion.

Ohio Research Institute for Transportation and the Environment (ORITE)

The Ohio Department of Transportation has awarded ORITE a research contract to determine why certain asphalt concrete and Portland cement concrete pavements are providing much better service than was anticipated during design. Specific factors associated with these longer-lasting pavements will be incorporated into standard practice to improve the performance of highway pavements statewide.

Ohio Coal Research Center

Ohio Coal Research Center researchers have developed bioreactor technology for converting greenhouse gases emitted by coal-fired power plants into biomass. The process, which uses natural sunlight collected using mirrors and distributed via fiber optic cables, offers not only the advantage of removing greenhouse gases from the flue gas, but also provides a feedstock for the creation of biofuels, such as biodiesel. Using the bioreactor, it may be possible to produce 100 times more oil per acre of harvested sunlight than is possible by growing soybeans.