



SVC NEWSLETTER

December 2007 Issue

NSF I/UCRC Smart Vehicle Concepts (SVC) Center at The Ohio State University

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SVC Website

The Center website has a new look. Please visit us online at: <http://SmartVehicleCenter.org>

You will find the latest project proposals on the projects page, reports on the IAB page, and receive frequent updates on the News page. Please contact Prof. Singh for the latest log-ins to the protected (members only) pages.

Membership

We are pleased to report that membership to the Industrial Advisory Board continues to grow. The following members and affiliates have formally joined or are in the process of joining:

Founding Industrial Members (2007-08)

- Advanced Numerical Solutions
- American Axle & Manufacturing
- Army Research Laboratory
- The Boeing Company (in process)
- Edison Welding Institute
- Ford Motor Company (in process)
- Goodyear Tire & Rubber Co. (in process)
- Honda R&D Americas Inc.
- Honda Research Institute
- Moog Inc.
- NASA Glenn Research Center
- Tokai Rubber
- Transportation Research Center Inc.

Affiliate (2007-08)

- BorgWarner Inc.

Winter 2008 Meeting

A meeting for members of the Industry/University Cooperative Research Center (I/UCRC)

*February 6, 2008 12:00 PM to
February 7, 2008 5:00 PM
Columbus, Ohio 43210*

The first semi-annual project review meeting of the NSF I/UCRC Smart Vehicle Concepts (SVC) Center will be held on the campus of The Ohio State University in Columbus, Ohio on February 6 (Wed) and 7 (Thurs), 2008. The Industrial Advisory Board (IAB) will meet as well.

Faculty and student researchers will discuss ongoing projects and propose new or refined proposals. Members will have an opportunity to provide feedback on ongoing work, offer new ideas or leads regarding potential collaborators and direct future research problems. Potential members are welcome if they are willing to sign a non-disclosure agreement. The event is also posted on the NSF web site: http://www.nsf.gov/events/event_summ.jsp?cntn_id=110815&org=IIP

Travel information is given in this newsletter. More details will be sent in mid-January and posted on the Center website.

Preliminary Agenda of the Review Meeting

Location: E100 Scott Lab, Ohio State
201 West 19th Ave, Columbus, OH 43210

Feb. 6 - Wednesday

12:00-1:00 Registration / Boxed Lunch
1:00-3:00 Introductory Session
3:00-3:20 Break
3:20-5:00 Technical Session I
5:00-6:00 Reception

Feb. 7 - Thursday

7:30-8:00 Coffee
8:00-9:00 Short Course
9:00-10:30 Technical Session II
10:30-10:50 Break
10:50-12:15 Technical Session III
12:15-1:00 Boxed Lunch
1:00-3:00 IAB Meeting
(and Individual Meetings with
Researchers)
3:00-3:20 Break
3:20-4:00 Wrap-up Session
4:00 Adjourn
4:00-5:00 Optional Lab Tour

Miscellaneous Informational Items

Potential Partner Institutions: The Center is also in discussions with other academic institutions (in the U.S.) that may collaborate with Ohio State (the lead institution). In particular, Virginia Tech held a planning conference in August 2007.

IAB coordinator: Duane Detwiler of Honda R&D is the current IAB coordinator. For questions about the IAB, he can be reached at: <DDetwiler@oh.hra.com>.

NSF I/UCRC: Alex Schwarzkopf is the Program Director of the NSF I/UCRC:
<http://www.nsf.gov/eng/iip/iucrc>

NSF Evaluator: Eric Sundstrom is the NSF Evaluator. He can be reached at: <sundstrom.eric@gmail.com>.

Administrative Assistant: Greg Richey is the new office assistant for the Center. For questions about the project review meeting, he can be reached at <richey.102@osu.edu>.

Current Projects (at Ohio State)

The following projects are currently underway at Ohio State. Principal investigators (faculty members) are listed after the project titles:

Thrust A: Interfacial Mechanisms

- Project #1 - Electro-Hydrostatic Actuation and Sensing (E-HAS), Marcelo Dapino
- Project #3 - Comparative Design Tool for Examining the Feasibility and Performance of Smart Engine Mounts, Raj Singh
- Project #20 - Development of Interfacial Force Sensing Systems using Experimental and Computational Methods, Raj Singh
- Project #30 - Development of Smart Engine Mount Actuation Mechanism and Active Elastomers, Marcelo Dapino
- Project #31 - Adaptive Seat Belt System Using Smart Material Technologies, Marcelo Dapino
- Project #35 - Development of Contactless Torque Sensor, Marcelo Dapino
- Project #36 - Joining of Shape Memory Alloys and Structural Materials, Marcelo Dapino and Tim Frech

Thrust B: Adaptive NVH

- Project #7 - Multifunctional Composites with Embedded Sensing and Stiffness Control, Marcelo Dapino and John Lippold
- Project #29 - Silent Gearbox Concepts, Raj Singh and Ahmet Kahraman
- Project #32 - Critical Assessment of Passive and Active Noise and Vibration Technology for Rotorcraft Gearboxes and Airframes, Raj Singh and Greg Washington
- Project #33 - Micro-Sensors for Sound Measurement, Marcelo Dapino

Contacts

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Happy Holidays!

Smart Materials: Steering innovation in vehicle design

By Rachel Lichtenfeld

Engineering researchers are bringing lighter, more intelligent materials to automobile design.

The new Smart Vehicle Concepts Center, led by mechanical engineering professors Rajendra Singh, center director; Marcelo Dapino; and Gregory Washington, associate dean for research, has received a five-year National Science Foundation grant for research and development that supports the production of smart materials.

“Right now we have smart materials being made in smaller quantities, at a higher cost,” says Dapino. “Eventually, we want to change this to higher quantities, at low cost.”

Smart material actuators and sensors have significant advantages over conventional devices because they have no moving parts and thus are lighter and more reliable. It’s much like a flash drive compared to a hard drive in a desktop computer; chances are the former will be mechanically more robust. The flash drive is also much lighter than its counterpart. Putting lighter materials in cars makes them less heavy, and thus more energy-efficient.

“Companies are looking for ways to create products with enhanced features that also have reduced mass and complexity, higher energy efficiency and

yet are cheaper to make,” says Dapino. “Smart materials can overcome these contradicting requirements in a way that is perhaps impossible with conventional technologies.”

Smart materials applications could improve the efficiency, reliability and functionality of vehicles. Center researchers speculate that much more can be done with smart materials, from improving all aspects of noise and vibration absorption in cars to providing advanced information and entertainment functions to the occupants. Smart materials also could be used in sensors that can configure the safety systems of the car after detecting the physical characteristics of the passengers.

In addition to training students and recent doctorate recipients looking to enter this engineering field, the center will conduct research and development for a consortium of companies worldwide via its Industrial Advisory Board. This board is comprised of one representative from each company that pays the annual membership fee. The members determine the projects to be conducted by the center, which already has recruited 11 notable organizations such as Ford Motor Co., the Army Research Laboratory and Honda R&D Americas Inc. and has exceeded the

fundraising goals put forth by the NSF.

Projects under way at the center include work on electro-hydrostatic actuation and sensing, silent gearbox concepts, panel stiffness control using embedded actuators, microacoustic sensors and adaptive seat belt systems using smart materials.

“We appreciate the overwhelming support for our research and academic programs from the NSF, industry and government labs,” says Singh. “Our vision is to grow this center into a national leader, and we expect that our research will lead to smarter consumer products and vehicles. Overall, it is an exciting opportunity for our engineering students and programs.”

Contact:

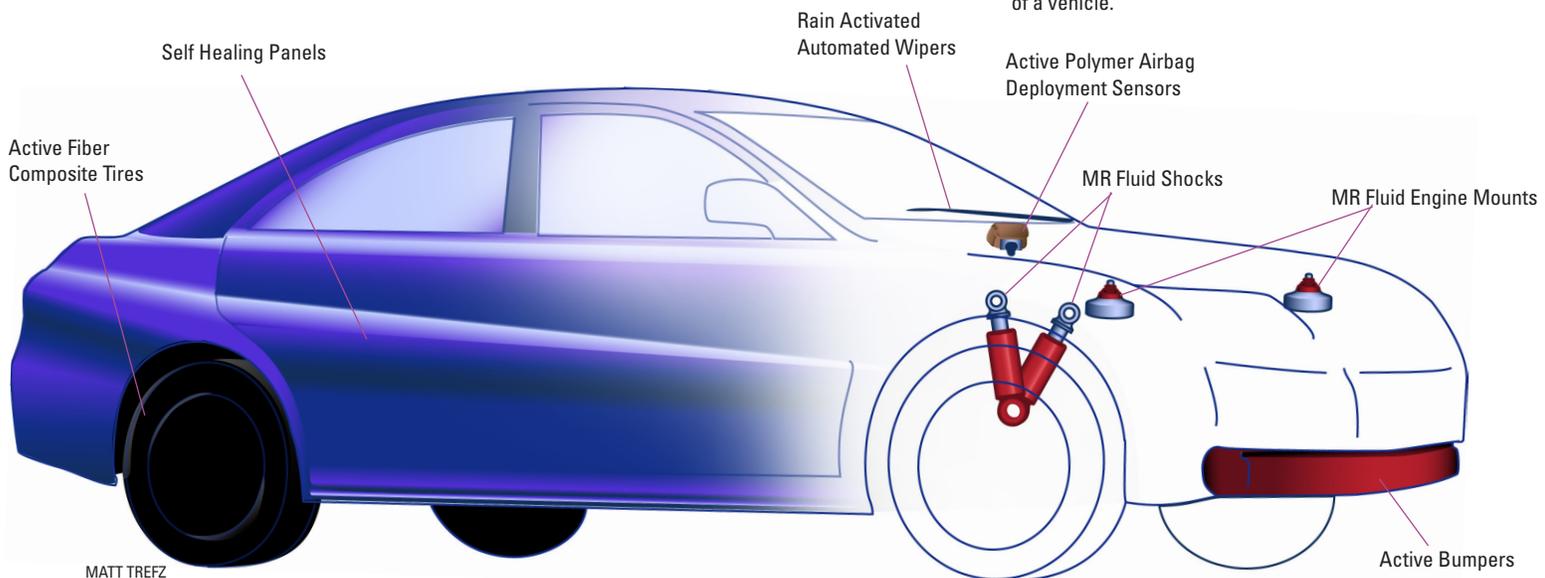
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On the Web: Smart Vehicle Concepts Center, rclsgi.eng.ohio-state.edu/svc

Smart materials such as those under development at Ohio State’s Smart Vehicle Concepts Center can revolutionize almost every aspect of the operation of a vehicle.



MATT TREFZ

Travel Information

Nearby Hotels

The Blackwell (on campus hotel)
2110 Tuttle Park Place, Columbus, OH 43210
(614) 247-4003, (866) 247-4003
<http://www.theblackwell.com>

Holiday Inn (in walking distance of Ohio State)
328 West Lane Ave, Columbus, OH 43201
(614) 294-4848, (800) 465-4329
<http://www.holidayinnosu.com>

University Plaza Hotel & Conference Center
(transportation to campus available)
3110 Olentangy River Rd, Columbus 43202
(614) 267-7461, (877) OS-PLAZA
<http://www.universityplazaosu.com>

Baymont Inn & Suites
3246 Olentangy River Rd, Columbus 43202
(614) 267-4646
<http://www.baymontinns.com>

Fairfield Inn & Suites (Marriott)
3031 Olentangy River Rd, Columbus 43202
(614) 267-1111
<http://www.marriott.com>

Red Roof Inn
441 Ackerman Road, Columbus, OH 43202
(614) 267-9941
<http://www.redroof.com>



Scott Laboratory, The Ohio State University
(201 West 19th Ave, Columbus, OH 43210)

Directions to Ohio State

Maps of Tuttle Parking Garage & Scott Lab:
<http://www.osu.edu/map/building.php?building=088>
<http://www.osu.edu/map/building.php?building=148>

From Port Columbus International Airport

- Take I-670 W to SR 315 N
- Exit at Lane Ave and turn right/east

From the East

- Take I-70 W to SR 315 N
- Exit at Lane Ave and turn right/east

From the South

- Take I-71 N to SR 315 N
- Exit at Lane Ave and turn right/east

From the West

- Take I-70 E to I-670 E to SR 315 N
- Exit at Lane Ave and turn right/east

From the North

- Take I-71 or US 23 S to I-270
- Take I-270 W to SR 315 S
- Exit at Lane Ave and turn left/east

THEN (including where to park)

- Cross over the Lane Ave Bridge
- Turn right on Tuttle Park Place
- Continue through light at Woody Hayes Dr.
- Turn left into Tuttle Parking Garage entrance
- After parking, walk east on W 19th Ave to Scott Laboratory (room E100)

