

Recent SVC Members

American Axle and Manufacturing
Advanced Numerical Solutions
Army Research Laboratory
Bridgestone Americas Tire Operation, LLC
Eaton Innovation Center
Edison Welding Institute
Ford Motor Company
F.tech R&D*
Goodyear Tire & Rubber
Honda R&D Americas Inc.*
Hyundai-Kia Motors*
MIT Lincoln Laboratory
Moog Inc.
NASA Glenn Research Center
REL, Inc.
Solidica
Tenneco, Inc.
The Boeing Corporation
Tokai Rubber
Toyota Research Center
Transportation Research Center, Inc.*
**Indicates 2 or more memberships*

Recent SVC Affiliates

BorgWarner F.tech R&D YUSA

Recent SVC Invited Observers

LMS Software MSC Software Romax
Solidica

SVC Mission

- Conduct basic and applied research, with application to ground and aerospace vehicle components and systems
- Build an unmatched base of research, engineering education, and technology transfer with emphasis on improved vehicle performance
- Develop well-trained engineers and researchers (at the undergraduate, MS, and PhD levels) with both experimental and theoretical viewpoints

What Does the SVC Offer?

- Comparative evaluation of existing materials or concepts
- Development of new sensors, actuators, and control algorithms
- New (revolutionary) design paradigms using smart materials
- Better understanding of vehicle constraints and environments
- New vehicle components and sub-systems
- New or improved models for static, dynamic, or thermal responses
- Tools to improve the vehicle developmental cycles and understand the limits of existing components
- Explore technologies for new applications or markets



Contact Information

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Assoc. Director
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Information on the semi-annual and annual SVC meetings is posted here:
<https://svc.engineering.osu.edu/meetings>

Membership Fee Structure

- **\$40K/year - Membership**
(One vote per full membership; intellectual property rights on all Center projects)
 - For a guaranteed solo project, an additional "project" fee is required (\$10K in 2016).
 - At least two \$40K membership fees from 2 members are required for an "umbrella project". An "umbrella project" is defined as a cluster of related sub-projects in the same overall research area.
- **\$10K/year - Affiliate**
(Access to one ongoing project; no voting rights)

SVC Website

Please visit us online:
<http://smartvehiclecenter.org>
<https://svc.engineering.osu.edu/>

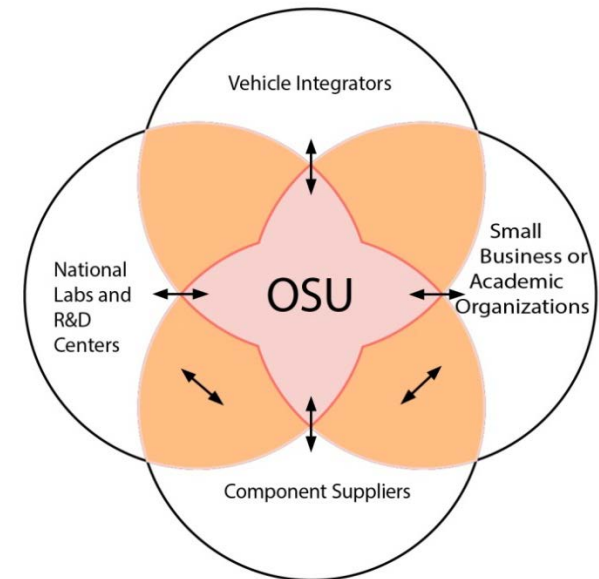
NSF Fact Sheet on the SVC:
<http://174.143.170.127/iucrc/publicFactSheetServlet?centerId=37>

July 2016 Edition



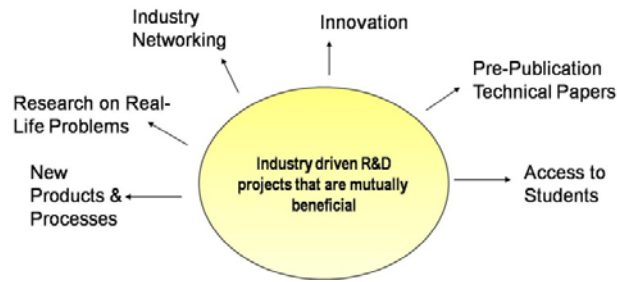
Smart Vehicle Concepts Center (SVC)

National Science Foundation
Industry/University Cooperative Research
Center (est. 2007)



The Ohio State University
Phase I: 2007 – 2012
Phase II: 2012 – 2017

I/UCRC - Cooperative Center Concept & Benefits to Industry



The National Science Foundation (NSF) Industry/University Cooperative Research Center (I/UCRC) program provides industry, government, and other organizations the means to leverage research and development (R&D) investments with centers renowned for their innovative research capabilities.

- NSF program encourages collaborative research
- Focus on pre-competitive research
- Driven by Industry to efficiently utilize the talents and resources of a university
- The NSF appoints an evaluator to ensure quality control
- Accomplishes research at a fraction of the cost
- Provides an avenue to investigate a topic of common interest
- Allows an industry to efficiently utilize the talents and resources of a university
- Provides an excellent recruiting tool
- Leveraging: Nominal membership fee, when combined with cost-sharing and NSF money, gives members access to over **\$1M** per year of research and associated intellectual property.

Industrial Advisory Board

- IAB consists of one representative from each industrial member.
- The board is responsible for evaluating current research thrusts, suggesting new opportunities, evaluating center operations, and matching center capabilities with unfilled research needs.
- IAB holds 2 meetings each year.

Pre-Competitive Research Paradigm

- Overcomes basic obstacles that prevent a technology from being used in commercial applications
- Provides an understanding of the characteristics of new technologies
- Is aimed at providing the tools, information, and data that enables others to develop future products and services
- Offers equal benefit to all competitors
- Develops industry standards and test procedures where no precedents exist

Typical Sponsored Projects

- **Interfacial Mechanisms**
 - Development of Interfacial Force Sensing Systems using Experimental and Computational Methods
 - Characterization of Vehicle Subframes
 - Analysis of Automotive System Isolators
 - Inverse Identification Method Applied to Radiator Mounts
- **Vibration, Noise, and Motion Control**
 - Ultrasonic Friction Control
 - Non-Contact Measurement, Visualization, and Analysis of a Smart Dynamic System
 - Hybrid Modeling Methods for Vehicle Subframes
 - Active and Passive Methods for Powertrain Vibration Control and Reduction of Noise Radiated from Shells
 - Morphing Panels for Aerodynamic Performance
 - Multifunctional Magnetostructural Systems: Experiments and Computer Simulation
- **Machine and Material Diagnostics**
 - Characterization and Modeling of Rubber Bushings
 - Smart Condition Detection and Monitoring
 - Stress Field Development During Load Transfer in Functionally Graded Metal Matrix Composite Macro Interfaces
- **Manufacturing and System Integration**
 - Electro-Hydrostatic Actuation and Sensing (E-HAS)
 - Ultrasonically-Assisted Metal Forming
 - Characterization and Modeling of Hydraulic Bushings
 - Thermally Invariant Smart Composites
 - Mechanoluminescent Paintable Light Sources in Automotive Lighting Systems
 - UAM for Automotive Structures

Smart Vehicle Concepts Center (SVC) History

- The Smart Vehicle Concepts Center was officially launched in July 2007 with support from NSF and industrial members.
- Phase I: 2007 - 2012
- Texas A&M University joined SVC as an academic partner from summer 2008 to spring 2013.
- The SVC was renewed for another 5 years (Phase II: 2012 – 2017) effective July 1, 2012 as a single-site center.
- The Center holds 2 meetings per year – semi-annual meeting in winter and the annual meeting in summer
- The proposal for Phase III (from July 2017 to June 2022) will be formulated in autumn 2016 and submitted to the NSF.

Key Project Leaders



Raj Singh
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(Emeritus Professor; Director of SVC)
Expertise: Noise & vibration control, dynamic simulation, nonlinear dynamics, DSP



Marcelo Dapino
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(Honda R&D Americas Chair and Professor; Assoc. Director of SVC)
Expertise: Smart materials and structures, high power ultrasonics, additive manufacturing



Vishnu Sundaresan
Sundaresan.19@osu.edu
(Assistant Professor)
Expertise: Piezoelectric materials, active polymers, bio-derived materials, magnetostrictive materials



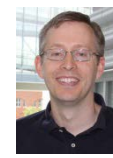
Soheil Soghrati
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(Assistant Professor)
Expertise: Advanced FEM; modeling multiscale response of advanced/bio-materials and structures



Ryan Harne
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(Assistant Professor)
Expertise: Structural acoustics, vibration energy harvesting, nonlinear dynamics



Jason Dreyer
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(Assistant Professor - Clinical)
Expertise: Experimental methods, dynamics, noise & vibration control



Scott Noll
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(Research Scientist)
Expertise: Structural dynamics, jointed assemblies, design, inverse methods