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For more information on S^2ERC, visit our website at www.serc.net!
WELCOME TO THE S$^2$ERC!

Dear Prospective Center Affiliates,

I invite you to join the Security and Software Engineering Research Center (S$^2$ERC), a National Science Foundation Industry/University Cooperative Research Center (I/UCRC). The S$^2$ERC has a history stretching back 28 years, but we’ve seen considerable growth recently as we have become even more of a multi-university center, with Georgetown University joining Virginia Tech, Iowa State, and Ball State (lead) to create a research center with four primary, NSF-supported sites. As a result, S$^2$ERC affiliates have at their fingertips more research possibilities than ever before.

A broad spectrum of companies and government agencies have committed to fund the work of the S$^2$ERC because it contributes to the pursuit of their individual objectives. You’ll find a complete listing of our affiliates in the pages that follow. Our mission is to deliver practical, customized research that you can readily implement in your organizations. Researchers of the S$^2$ERC strive to consistently generate projects that address affiliates’ vital needs, and every affiliate member sets its own research agenda by hand-picking and customizing the research projects in which it invests. As a result, technology transfer is the hallmark of the S$^2$ERC – resulting in a research center that is proven, dedicated, cost-effective, and collaborative. Collaboration means that your money goes further, to the extent that some of our affiliates have documented 7:1 to 10:1 returns on their investment in the S$^2$ERC!

An I/UCRC is designed to be a win-win situation. Researchers gain because they have access to real-world data and experienced practitioners who can validate their models and guide their research, not to mention provide research funding. Affiliates, on the other hand, interact with world-class researchers and have immediate access to innovative projects that often go beyond areas they might normally attempt in-house. Affiliates also have the advantage of hiring new graduates and finding quality summer interns. Affiliates have even had, in some cases, the opportunity to send personnel for advanced degrees while working on company-specific projects. In short, the S$^2$ERC is a partnership between academia and industry that offers multi-faceted benefits on both sides of the technology transfer equation.

The S$^2$ERC holds two showcases each year. These meetings showcase the current research in the center, including your organization’s project, projects sponsored by other organizations, and researchers’ proposals for new projects. Because we know that budgets are tight, a registration fee of less than $300 for a two-day showcase, including all meals and handouts, is a definite win. Showcases are a time to collaborate with researchers and other affiliates, and make decisions about how to work smarter. As an affiliate member in the S$^2$ERC, you have direct access to all of the research. You are part of a research community, and the center thrives on your feedback and participation.

On behalf of our university sites and current affiliates, I invite you to join a research center that can change the way you do business. We look forward to hearing from you. Sample letters of interest and commitment to join are included for your convenience. For more information, feel free to contact me.

Dr. Wayne M. Zage  
Director, Security and Software Engineering Center (S$^2$ERC)  
Professor, Department of Computer Science, Ball State University, Muncie, Indiana  
(765) 285-8664 | wmzage@bsu.edu
ABOUT THE S²ERC
WHO WE ARE & WHAT WE DO

Beginnings & Evolution
In 1976, the National Science Foundation established the Industry/University Cooperative Research Center Program to encourage more collaborative endeavors between academia and industry. Our IUCRC, now in its 29th year of operation, is one of over one hundred IUCRCs established by NSF, and the only center devoted to software engineering. In 2004, the original Software Engineering Research Center (SERC) graduated from the IUCRC Program and became a self-sustaining research center. As SERC’s research focus evolved to incorporate software and system security, NSF invited SERC to propose a new IUCRC. In February 2010, the SERC – housed at Ball State University – combined research strengths with the Center for Information Protection – another IUCRC, housed at Iowa State University. The Security and Software Engineering Research Center (S²ERC) was born. The S²ERC continues to grow and evolve: In July 2011, Virginia Tech, with its focus on the research challenges of cyber security, became our third NSF-funded site, and most recently, in April 2014, Georgetown University gained NSF endorsement as the fourth funded site of S²ERC.

Research in the S²ERC
A thorough list of current projects and selected past projects can be found in the Research Projects section of this guide. Recent projects have focused on these issues: intrusion detection, ad-hoc network security, wireless security, attack-tolerant systems, trustworthiness in cloud and mobile applications, security & vulnerability analyses, information protection, requirements capturing, software design, software metrics, software feature analysis, software testing, software reliability, user interface design, usability issues, global software development, migrating software to multi-core architecture, visualization environments, interactive collaborative environments, dynamic & static analyses, and testing and model checking for concurrent programs. When a need in a specific field or area arises, S²ERC consistently draws in viable and respected researchers to address that need. Projects are generally carried out within a 2-to-4 year time horizon, a standard set by affiliates.

S²ERC research advances have been described in over 300 technical reports and in thousands of journals and refereed conference papers. Many papers submitted by SERC researchers and students, sometimes with an affiliate practitioner as a co-author, have won awards such as best conference paper or even best paper in a specific area over a decade. One research direction, software design metrics, won the prestigious national Alexander Schwarzkopf Award for Technological Innovation in 2007. Today the S²ERC continues to support and cultivate the productive reasoning, imagination, and collaboration in customized research projects that have made the past 28 years so successful.
Mission
The mission of the Security and Software Engineering Research Center is to conduct a program of applied and basic research on software security, system security and software engineering problems to enable technology gains in member organizations.

Who is the S²ERC
S²ERC researchers are faculty and students from Computer Science, Electrical Engineering, Industrial Engineering, Management, Mathematics, and Systems Engineering programs at 14 universities. The four primary NSF-funded sites are Ball State University (lead), Georgetown University, Iowa State University, and Virginia Tech. The following ten institutions also participate in active research associations with S²ERC: Penn State University, Purdue University, University of Illinois at Chicago, University of West Florida, Indiana University Purdue University Indianapolis, Indiana University Purdue University Fort Wayne, James Madison University, DePaul University, and, internationally, Bournemouth University, England, and the University of Limerick, Ireland.

The S²ERC attracts a diversity of creative, high-energy researchers who represent the best in their field. S²ERC researchers are national research prize winners, NSF Career Award winners, patent holders, chairpersons or co-chairpersons of major software conferences, and editors of major publications in software engineering. NSF recognized SERC’s 20-year commitment to software engineering research excellence with the NSF Excellence Award presented to SERC Director Wayne Zage in November 2005.

Researchers work with practitioners at a wide range of affiliate industry and government sites. S²ERC affiliate POCs provide guidance, feedback, and funding, as well as real-world data and problems to solve. The S²ERC strives to cultivate a rich industry-university dialogue at every phase of the technology transfer, making customized software engineering research projects the norm in the S²ERC. A complete listing of current committed companies and government agencies can be found in the Government and Industry Affiliates section of this guide.
Ball State University, Virginia Tech, Georgetown University, Iowa State University, Indiana University-Purdue University Indianapolis (IUPUI), DePaul University, Penn State, University of Illinois at Chicago, Indiana University-Purdue University Fort Wayne (IPFW), Purdue University, University of Limerick, University of West Florida, Rochester Institute of Technology

**BOLDED UNIVERSITIES ARE FUNDED CENTER SITES**
Research is at the heart of the S²ERC. It’s why we exist: to bring together industry and academia into collaborative partnerships for research efforts that benefit all. In order to connect our affiliates’ interests with the research topics of our researchers, the S²ERC takes a hands-on approach and ensures the highest levels of satisfaction and ROI for our members.

“How does research begin?”

**IRFPs**

Affiliates often know what research areas they want to pursue. An affiliate with a particular problem may submit an Industrial Request for Proposal (IRFP). The director circulates the IRFP to the S²ERC researcher community, giving researchers the opportunity to develop proposals to address the need. The proposal chosen by the affiliate then proceeds as a collaborative effort.

**University Proposals**

Researchers also have the opportunity to propose their research ideas to affiliates. Before the showcase, researchers submit new proposal snapshots, and affiliates vote online to determine which new proposals will be presented at the meeting.

A Project’s Beginning

In addition to proposals resulting from an affiliate’s IRFP, a researcher’s proposal idea can take the following steps to become a S²ERC funded project.

1. A problem is discovered
2. A research snapshot is submitted
3. New proposal snapshots are voted on by the IAB
4. Selected snapshots lead to proposals presented at semi-annual showcases
5. Affiliate chooses to fund a new proposal and a collaborative research effort begins
HIGHLIGHTS & BENEFITS OF MEMBERSHIP

WHY SHOULD YOU JOIN THE S²ERC?

- Customized security and software engineering research projects
- 7:1 to 10:1 return on investment
- Access to innovations that may lead to new products
- Improvement of software quality and research productivity
- Access to expertise in new software engineering and security technology
- Use of unique laboratories and facilities with low overhead costs
- Networking with industry and government leaders
- Technical reports, on-site short courses and seminars
- Summer interns, potential future employees

Membership in the S²ERC allows you to connect with some of academia’s brightest minds who may help to solve your organization’s toughest problems.

For testimonials from our affiliates, visit our website at www.serc.net!
<date>

Dr. Wayne M. Zage  
Director, Security and Software Engineering Research Center  
Professor, Computer Science Department  
Department of Computer Science, RB 455  
Ball State University  
Muncie, IN 47306

Dear Dr. Zage:

<You or your company or organization> is happy to hear that the National Science Foundation has funded your proposal to establish the Security and Software Engineering Research Center (S²ERC) in their Industry/University Cooperative Research Center Program. <Your company or organization > will join the S²ERC starting <beginning date>.

(Optional) Our plan is to join with a double membership at a minimum of $60,000.

(Optional) Security and software engineering continue to be two critically important areas to our company and to our nation. ... (more about how the research is important to your company or organization)

Sincerely,

Contact Person: ____________________  
Address: _________________________  
____________________  
____________________  
Phone: _________________________  
Email address: ____________________
<date>

Dr. Wayne M. Zage
Director, Security and Software Engineering Research Center
Professor, Computer Science Department
Department of Computer Science, RB 455
Ball State University
Muncie, IN 47306

Dear Dr. Zage:

<You or your company or organization> is happy to hear that the National Science Foundation has funded your proposal to establish the Security and Software Engineering Research Center (S^2ERC) in their Industry/University Cooperative Research Center Program. <Your company or organization > supports the formation of the new Center and would be interested in learning more about the S^2ERC in the near future.

(Optional) The fields of information security and software engineering continue to be ... (more about how the research is important to your company or organization)

Sincerely,

Contact Person: __________________
Address: ______________________
____________________
____________________
Phone: ______________________
Email address: __________________
Affiliation Agreement

This Agreement is made by and between Ball State University, (hereinafter called "UNIVERSITY") and ______________________________ (hereinafter called "AFFILIATE").

WHEREAS, the National Science Foundation ("NSF") Industry/University Cooperative Research Center (I/UCRC) for the Security and Software Engineering Research ("S2ERC" or "CENTER") will be composed of UNIVERSITY and any other research site funded by the I/UCRC program; and

WHEREAS, the parties to this Agreement intend to join together in a cooperative effort to support the S2ERC at the UNIVERSITY to maintain a mechanism whereby the UNIVERSITY environment can be used to perform research to improve the security and software engineering capabilities of its affiliates.

NOW, THEREFORE, The parties hereby agree to the following terms and conditions:

A. CENTER will be operated by certain faculty, staff and students at the UNIVERSITY. For the first five years, the CENTER will be supported jointly by industrial firms, Federal laboratories, the National Science Foundation (NSF), the State, and the UNIVERSITY. It is possible that the UNIVERSITY may receive support from NSF for an additional ten years.

B. Any company, Federal Research and Development organization, or any Government-owned Contractor Operated laboratory may become an AFFILIATE of the CENTER, consistent with applicable state and federal laws and statutes.

C. There will be an Industrial Advisory Board ("IAB") composed of one representative from each affiliate. This board makes recommendations on (a) the research projects to be carried out by CENTER (b) the apportionment of resources to these research projects, and (c) bylaws/operational procedures and adoption of any changes to them. The CENTER will begin to develop research projects that are recommended at the first Industrial Advisory Board meeting. There are three types of Affiliate Memberships, depending upon the level of contribution paid to the S2ERC: Full Affiliate Membership gives the Affiliate one vote in the IAB; Double Affiliate Membership gives the Affiliate a maximum of two votes in the IAB; Associate Affiliate Membership gives the Affiliate non-voting representation in the IAB, The operation of the IAB is further described in the bylaws/operating procedures of the CENTER.

D. AFFILIATE agrees to pay an annual fee for one of the membership categories as indicated below:

1) FULL AFFILIATE MEMBERSHIP: Thirty Thousand Dollars ($30,000) annually for one (1) year’s membership;

2) DOUBLE AFFILIATE MEMBERSHIP: Sixty Thousand Dollars ($60,000) or more annually for one (1) year’s membership;

OR

3) ASSOCIATE AFFILIATE MEMBERSHIP: Five Thousand Dollars ($5,000) annually for one (1) year’s membership.

Payment of these fees shall be made to Ball State University as a lump sum effective upon the Sponsorship Effective Date indicated below AFFILIATE’s signature on this Agreement and on the anniversary of that date for subsequent years; or in four equal quarterly installments due and payable on
the first day of each calendar quarter beginning with the Sponsorship Effective Date and continuing throughout each year of sponsorship. Checks from AFFILIATE should be mailed to Contracts and Grants Office, Ball State University, 2000 W. University Avenue, Muncie, Indiana, 47306 and made payable to Ball State University. Because research of the type to be done by the CENTER takes time and research results may not be obvious immediately, AFFILIATE should join CENTER with the intention of at least two years of sponsorship. However, AFFILIATE may terminate this Agreement by giving UNIVERSITY 90 days written notice prior to the termination date.

E. UNIVERSITY reserves the right to publish in scientific or engineering journals the results of any research performed by CENTER. AFFILIATE, however, shall have the opportunity to review any paper or presentation containing results of the research program of CENTER prior to publication of the paper, and shall have the right to request a delay in publication for a period not to exceed ninety (90) days from the date of submission to AFFILIATE, for proprietary reasons, provided that AFFILIATE makes a written request and justification for such delay within sixty (60) days from the date the proposed publication is submitted by certified mail to AFFILIATE.

F. All patents derived from inventions conceived or first actually reduced to practice in the course of research conducted by the CENTER shall belong to UNIVERSITY. UNIVERSITY, pursuant to chapter 18 of title 35 of the United States Code, commonly called the Bayh-Dole Act, will have ownership of all patents developed from this work, subject to "march-in" rights as set forth in this Act. UNIVERSITY agrees that all such CENTER affiliates are entitled to a nonexclusive royalty-free license. AFFILIATE will have the right to sublicense its subsidiaries and affiliates. Affiliates that wish to exercise rights to a royalty-free license agree to pay for the costs of patent application. If only one Affiliate seeks a license, that Affiliate may obtain an exclusive fee-bearing license through one of its agents. AFFILIATE has the right to sublicense its subsidiaries and affiliates.

G. Copyright registration shall be obtained for software developed by CENTER. AFFILIATE shall be entitled to a nonexclusive, royalty-free license to all software developed by CENTER. AFFILIATE will have the right to enhance and to re-market enhanced or unenhanced software with royalties due to CENTER to be negotiated, based on the worth of the initial software.

H. Neither party is assuming any liability for the actions or omissions of the other party. Each party will indemnify and hold the other party harmless against all claims, liability, injury, damage or cost based upon injury or death to persons, or loss of, damage to, or loss of use of property that arises out of the performance of this agreement to the extent that such claims, liability, damage, cost or expense results from the negligence of a party's agents or employees.

I. Any official notice, invoice, and other correspondence between the parties under this Agreement shall be in writing and delivered by no less than First Class U.S. Mail service or facsimile transmission addressed to the other party's administrative contact as follows:

<table>
<thead>
<tr>
<th>S²ERC Administrative Contact</th>
<th>AFFILIATE Administrative Contact</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kathy Lucas, Director</td>
<td></td>
</tr>
<tr>
<td>Contracts and Grants Office</td>
<td></td>
</tr>
<tr>
<td>Ball State University</td>
<td></td>
</tr>
<tr>
<td>Muncie, Indiana 47306</td>
<td></td>
</tr>
<tr>
<td>Phone: (765) 285-5289</td>
<td>Phone: _________________________</td>
</tr>
<tr>
<td>Fax: (765) 285-5224</td>
<td>Fax: _________________________</td>
</tr>
</tbody>
</table>
IN WITNESS WHEREOF, UNIVERSITY and AFFILIATE have caused this Agreement to be executed by their duly authorized officials, to be effective as of the Sponsorship Effective Date indicated below. Affiliates’ signature, which day and month in subsequent years in which AFFILIATE adheres to the terms of this Agreement shall be called the anniversary date of this Agreement.

UNIVERSITY: Ball State University

Typed Name: ______________________ (Date) Typed Title: ______________________

AFFILIATE: ______________________

Typed Name: ______________________ (Date) Typed Title: ______________________

Date Sponsorship is to Become Effective:

☐ October 1, 20__ ☐ January 1, 20__ ☐ April 1, 20__ ☐ July 1, 20__

AFFILIATE Representative to Industrial Advisory Board (as described in Article D):

Name: ______________________

Title: ______________________

Address: ______________________

City: ______________________ State: __________________ Zip: __________________

Phone: ______________________

Fax: ______________________

Email: ______________________
FUTURE SHOWCASES

November 11-12, 2015
IUPUI
- Indianapolis, IN -

May 25-26, 2016
Ball State University
- Muncie, IN -

November 9-10, 2016
University of West Florida
- Pensacola, FL -

May 24-25, 2017
Georgetown University
- Washington, D.C. -