
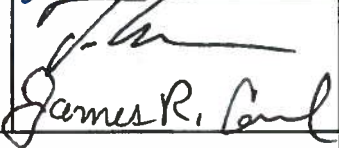



## COVER SHEET FOR GRANT PROPOSALS

State Board of Education

SBOE PROPOSAL NUMBER: (to be assigned by SBOE)		AMOUNT REQUESTED: \$2,100,000	
TITLE OF PROPOSED PROJECT: Computer Science at Boise State University—An Investment in Idaho's Future			
SPECIFIC PROJECT FOCUS:  The project plan involves four strategies that align with our objectives. The first strategy involves maintaining IGEM funding for 4 faculty lines to leverage the tactical hires we made with the first round of HERC funding to grow programs in cyber-security and big data. The second strategy involves promoting greater integration and collaboration between the Department and industry. The third strategy focuses on how the CS department can integrate, support and impact interdisciplinary research across the University and support entrepreneurship. The fourth strategy will focus on continued growth of the student pipeline through techniques to attract, retain and graduate a higher quantity of quality students.			
PROJECT START DATE: 7/1/15		PROJECT END DATE: 6/30/18	
NAME OF INSTITUTION: Boise State University		DEPARTMENT: Computer Science	
ADDRESS: 1910 University Drive, Boise, ID 83725			
E-MAIL ADDRESS: osp@boisestate.edu		PHONE NUMBER: 208-426-4420	
NAME:		TITLE:	SIGNATURE:
PROJECT DIRECTOR/PRINCIPAL INVESTIGATOR	Amit Jain	Associate Professor and Chair	
CO-PRINCIPAL INVESTIGATOR	Tim Andersen Jim Conrad	Professor and Chair Clinical Assistant Professor	
NAME OF PARTNERING COMPANY: N/A		COMPANY REPRESENTATIVE NAME: N/A	
NAME:		SIGNATURE:	
Authorized Organizational Representative	Karen Henry	 4/23/15	

**COMPUTER SCIENCE AT BOISE STATE UNIVERSITY—AN INVESTMENT IN IDAHO’S FUTURE**

This proposal seeks funding through the Idaho Global Entrepreneurial Mission (IGEM) and State Board of Education Higher Education Research Council (HERC) to continue the strategic forward momentum of the Boise State University Computer Science Department to help meet compelling state economic development, research, and workforce needs.

1.	Idaho Public Institution	Boise State University
2.	Project Directors	<p>Dr. Amit Jain, Associate Professor and Associate Chair, Computer Science Department, College of Engineering, Boise State University</p> <p>Dr. Tim Andersen, Professor and Chair, Computer Science Department, College of Engineering, Boise State University</p> <p>Dr. Jim Conrad, Clinical Assistant Professor, Computer Science Department, College of Engineering, Boise State University</p>
3.	Objectives	<p>To drive strategic support for the Computer Science Department at Boise State University to:</p> <ol style="list-style-type: none"> <li>1. Sustain current faculty lines and continue forward trajectory.</li> <li>2. Increase partnerships with local companies to facilitate knowledge development and transfer</li> <li>3. Increase CS related research and economic development activity.</li> <li>4. Produce more computer science graduates that qualify for software and related technical positions in Idaho</li> </ol>
	Amount Requested	\$700,000 per year for three years, totaling \$2,100,000

**4. Resource Commitment.** The objectives of this proposal are consistent with the five-year Strategic Research Plan for Higher Education developed by the Vice Presidents for Research at the three Idaho Universities. The plan identifies strategic research areas that have great potential to drive future economic growth within the state. One of these five high-impact areas is Information Management and Software Development. Boise State has responded to this challenge by identifying the transformation of its Computer Science (CS) Department to meet the research and workforce development needs of industry as one of its top institutional priorities. Over the last three years, the University has identified emerging areas of strength within the CS Department and the University continues to invest in this effort.

**5. Specific Project Plan.** The project plan involves four strategies that align with our objectives. The first strategy involves sustaining IGEM funding for 4 existing faculty lines to leverage the tactical hires we made with the first round of HERC funding to grow programs in Cyber Security and Big Data. The second strategy involves promoting greater integration and collaboration between the CS Department and industry. The third strategy will focus on how the CS department can integrate, support and impact interdisciplinary research across the University and support entrepreneurship. The fourth strategy will focus on continued growth of the student pipeline through techniques to attract, retain and graduate a higher quantity of quality students.

***Strategy One: Sustaining Faculty in Emerging Areas of Strength.*** Boise State University will sustain and leverage the strategic faculty hires that were made in the first round of HERC funding to accelerate the growth in the areas of Cyber Security and Big Data to expand research, industry collaboration and teaching capacity. The four faculty hired were Dr. Xu (Cyber Security and Software Engineering), Dr. Dialani (Big Data), Dr. Sherman (Software Engineering), and Dr. Cutchin (Big Data Visualization). Dr. Conrad was also hired for a year on

the first IGEM grant and has been moved to an existing line in the department. Dr. Xu recently led the creation of a Cyber Security minor and is currently leading the effort to create an interdisciplinary PhD program in Computing with tracks in Computer Science, Cyber Security and Computational Science and Engineering. The University has made significant additional infrastructure enhancements to help support the faculty recruitment and retention. In particular, the University received a \$1 million grant from the Idaho Department of Labor along with a \$280k match from eight industry partners. This grant and match, *Expand.CS*, allowed us to hire three additional lecturers and support staff and the University has committed to sustain these lines at the end of the *Expand.CS* funding. Recently, the CS Department has also received an allocation of eight faculty lines from the Legislature to further accelerate growth. The department plans to focus these hires in areas of Big Data, Cyber Security, Human Computer Interaction and Computer Science Education research (based on feedback from the industry advisory board). These hires will allow the department to create a Big Data track in both the Masters and PhD programs.

***Strategy Two: Tighter Industry Integration.*** The CS Department continues to increase its formal and informal connections with industry and the IGEM hires are integral to the following initiatives and connections.

*Growing partnerships with industry.* Boise State University will support and encourage CS faculty to establish partnerships with industry via joint research projects, service on industrial boards, consulting and faculty and student involvement. For example, Dr. Dialani and Dr. Andersen have been recently approved funding for a research project with the J.R. Simplot Co. that demonstrates the type of partnership with industry that we are encouraging. This project, *Precision Ag—Increasing crop yields using Internet of Things & data science*, will allow us to

instrument, model and capture data about our farming practices and create decision support systems for identifying and promoting best practices. With the use of sensor technologies, remote sensing (satellite imagery) and data analytics, the project will capture the photosynthetic capacity of the farm/field, effects of water and irrigation management, monitor top soil erosion, micro-climate conditions and crop rotation on the yield of the crop.

*Community Events.* The CS Department continues to host *Boise Code Camp* and participate in *develop.idaho* and *Hackfort* to strengthen connections with industry and entrepreneurs. Code camp has grown to over 1000 participants in 2015 and is now the largest code camp in the Northwest.

*Senior Design Projects.* The department introduced Senior Design projects two years ago wherein teams lead by Dr. Conrad and composed of 3-5 experienced, senior-level students work on industry sponsored projects as part of a 2 course sequence that spans 2 semesters. We have built from five projects last year to 10 this year in Senior Design, and nine out of the 10 projects are being monetized at the sponsoring company. As Senior Design is now required for students (starting in 2014), we expect the number of projects to continue increasing (upwards of 15-20 projects in AY15). A total of 21 potential projects were submitted by industry this year so a sufficient supply of projects is available.

*Growing Industry Participation in the Curriculum.* Build on existing industry involvement with workshops such as the weekly industry seminar, specialized classes taught by industry experts, industry visits to classrooms and internships. The *Expand.CS* program has added an additional 25 internships for students with industry partners with matching scholarships to keep them on track to graduate on time. Overall 80% of the students continue to hold internships.

*Growing the Industrial Advisory Board.* Over the last three years, the CS Department has

expanded and re-energized the industrial advisory board to reflect the growth of new software companies in the Boise area. Alden Sutherland, VP and CIO of MWI (a multi-billion dollar local company) currently heads the board. The board is actively involved with the department at various levels, and our goal is to keep this high level of involvement as both the department and board grow.

***Strategy Three: Interdisciplinary Research and Economic Development Activity.***

Research grant submissions and awards have increased several-fold during the first HERC IGEM grant. In the next phase, we will focus on two aspects: *interdisciplinary projects* and *entrepreneurial activity*. Since many research projects in CS are interdisciplinary in nature, the Department is having an impact on research and funding throughout the university and beyond. For example, Dr. Sherman and Dr. Andersen are involved in a research project funded by a Major Research Infrastructure grant from the National Science Foundation with Dr. Senocak from Mechanical Engineering. Another example is a volume visualization tool for Idaho National Lab, developed by Dr. Cutchin's team, that will allow interactive visualization of volumes up to 54 Terabytes in size. His team is also working with Earth Scientists at Boise State, Idaho State and University of Idaho to use Idaho earth science data sets and make them available via widely accessible Unity, GearVR and WebGL technology and tools. With this grant, we will seek to further promote and expand interdisciplinary research involving computer science through the creation of an interdisciplinary PhD in Computing, with tracks in CS, Cyber-Security, and Computational Science and Engineering, and with an eventual track in Big Data Analytics. Every department in the college of Arts and Sciences has expressed support for this interdisciplinary PhD program.

A second approach to economic development is to increase student interest in entrepreneurship.

Dr. Andersen will work with Dr. Kevin Learned, director of Boise State Venture College, to create a program to promote entrepreneurship amongst CS students. This program will use a freshman level course on entrepreneurship, classroom presentations in select sophomore and junior level courses by the Venture College, and the option to take a senior level course from a set of courses that have a CS business perspective, in order to expose and train students on the business side of technology, and to get them thinking with an entrepreneurial mindset. In addition, Dr. Andersen will work with Dr. Learned and the Venture College to create and promote an option within the senior design project sequence for interested students to start and work on their own company. Senior design teams that choose to pursue their own project/company will pitch their startup idea to the Venture College, and if accepted, will count towards their CS graduation requirements for the senior design project. Furthermore, accepted teams will be paired with students from the College of Business and Economics, and will be provided resources through the venture college to help start their company. One such example is the startup *BasedIn*, which has already received \$125K investment from external investors.

***Strategy Four: Enhancing the Student Pipeline.*** The fourth strategy will focus on the student pipeline through tactics to attract, retain and graduate a larger number of high-quality students. The number of students in the department has tripled over the last three years and the number of graduates has doubled from 25 to 50. With the number of students already in the pipeline in critical courses at junior level, we expect the number of graduates to increase to 70-80, and possibly up to a hundred graduates in three years.

***Computer Science in K-12.*** Several faculty from the department and one faculty from the College of Education have recently received a \$1 million three-year CS10K award from the National Science Foundation (Dr. Jain and Dr. Andersen are PIs on this grant) that will equip

high school teachers to teach computer science to their students. There are two programs for in-service teachers: Masters of STEM education (CS Emphasis) and a Graduate Certificate in CS Teacher Endorsement. Most of the funds in the grant are being used as tuition scholarships. Research has shown that exposure to quality computer science education in high school is the biggest factor in success in computer science in college. There are currently 30 teachers in this program from nine school districts and we expect to train around sixty teachers. The grant also supports several workshops to engage high school students with fun computer science activities. We expect that over time, this will lead to an increase in the quantity and quality of incoming computer science majors overall.

*Improved Retention.* Computer Science is a challenging academic discipline resulting in retention issues, particularly in lower-division courses. As part of the previous IGEM grant, the Department restructured the first two undergraduate Computer Science classes into three classes to allow students more time to absorb the material. Along with other strategies, this has led to an improvement in retention in the freshmen CS course from 65% to 85% over the last two years.

*Improved Time to Graduation.* Using the additional IGEM faculty, the Department has significantly increased the offerings of courses to handle the demand from increased enrollment, which has doubled the number of graduates from 25 to 50 per year.

*Maintain Curriculum Currency and Quality.* The curriculum has been enhanced with the introduction of Senior Design course with industry sponsored projects. Courses in Big Data, Cloud Computing, Software Security, Software Quality, Mobile Apps, Web Development and several others have been added to improve the currency and quality of the curriculum.

*Expanded Tutoring.* Using matching funds from the University, the department has built a Computer Science Tutoring Center that has been a key component in the increased retention and



graduation rates. The center is open seven days a week and staffed by graduate teaching assistants and undergraduate tutors. Going forward, the department plans to keep growing the tutoring center staff and space to keep up with the growth in enrollment.

**6. Potential Economic Impact.** *Promoting Technology Sector Growth.* The technology sector is and will be a critical component of Idaho's future knowledge-based economy. Boise State is well poised to build on existing university strengths and industry relationships to promote further sector growth in software companies as well as companies that rely on software engineers. This project will facilitate and accelerate the development of new knowledge and the transfer of technology out of our research facilities and into the private sector to increase industry competitiveness. This unique and dynamic partnership will expand on Boise State's current successes and will create new ideas, new products and new companies that will lead to higher-paying jobs and a stronger economic foundation.

*Serving Immediate Workforce Needs.* Graduates with computer science degrees are in high demand both nationally and in the Boise area, which is home to hundreds of established software and tech companies, such as Baliho, Clearwater Analytics, Cradlepoint, Healthwise, HP, Impact Sales, Keynetics, MarkMonitor, MetaGeek, Micron and WhiteCloud Analytics, to name a few. The recent doubling of the number of CS graduates from Boise State is helping but the extra graduates are getting snapped up, as the technology sector continues to grow at a faster pace. More than 90% of Boise State computer science graduates prefer staying in the Boise Metro area, and local industry actively seeks these students. Most have job offers before graduation, and they command among the highest starting salaries of any major.

*Attracting and Keeping Technology Companies in Idaho.* "Software is eating the world" is the tagline for Andreessen and Horowitz, the iconic venture capital firm in Silicon Valley. Scott

Kupor, the COO of Andreessen and Horowitz, was recently in Boise talking to a standing room only crowd of entrepreneurs and industry leaders, and *when asked to name Boise companies' challenges in attracting investor money, Kupor said the city doesn't have the talent base to support big time company growth. "It's the ability for companies to scale, the ability to go higher," Kupor said. "It's not just the 20th or 30th engineer, but the 100th engineer, and how you get the right executives to come."* However, he complimented the progress in the CS Department and its close ties to industry while challenging the Department to the next level of 100 and then 200 graduates (!) and increased startup activity. The ten-year long term vision of the CS department is indeed 200 graduates and 10 startups per year. Microsoft recently moved their development away from Idaho because they **could not hire enough software engineers.** This is a wakeup call for the state and would likely not have happened if we were graduating 100+ CS graduates. Idaho companies that can't find qualified Idahoans to fill software engineer/developer jobs are expanding their job searches beyond Idaho and offering high paying positions to out-of-state workers. However, the recent growth in the number of CS graduates is helping. Brad Wiskirchen, CEO of Keynetics and Kount, mentions in his support letter *that they are considering moving back jobs from their Colorado office to Boise.* The CS department has had several contacts from out of state companies wishing to open offices in Boise because of the growth in the department. Investing further in Boise State's computer science program will help ensure that Idaho companies will be able to better fuel growth and that we will attract high paying jobs to the state from companies wanting to relocate near the CS Department.

**7. Criteria for Measuring Success.** To evaluate success the following metrics will be used:

- The number of partnerships between the CS Department and local industry
- A quantified Computer Science presence in interdisciplinary research grants.

- The number of startups that the CS Department students and faculty are involved in.
- The number of qualified computer science students and graduates over three years.
- The placement rate of students and graduates and the percentage staying in Idaho

**8. Budget and 9. Budget Justification.** *A. Faculty and Staff.* Funds are requested for continued support of four tenure-track Computer Science Department faculty. Costs for the faculty are based on an annual salary of \$88,380, two at \$101,026 and \$119,205. The total salary request for three years is \$1,228,911. *B. Graduate/Undergraduate Students.* Funds are requested for five Graduate Assistants. The Graduate Assistant stipend is \$2,000 per month. Graduate Assistants will assist faculty in performing all research activities. Annual stipend per Graduate Assistant is \$24,000 or \$120,000 for five Graduate Assistants, totaling \$360,000 for the three year project. *C. Fringe Benefits.* The fringe benefit request for the Computer Science faculty is 30-34% of salary. The fringe benefit request for the Graduate Assistants is 6% of salary. The total fringe benefit request for three years is \$412,978. *D. Other Direct Costs.* Funds are requested for partial Graduate Assistant tuition and fee remission. Year 1 tuition and fees are estimated at \$10,849 per GRA and subsequent years include a 5% estimated escalation. The total tuition and fee remission costs are \$171,000 for 3 years. We are requesting \$98,112 of that amount and the balance, in the amount of \$72,889, will be provided by Boise State University.

**10. Institutional Commitment.** Boise State has identified the expansion of its Computer Science Department to meet the research and workforce development needs of industry as one of its top institutional priorities. The University's commitment to this effort is further affirmed by the significant resources it has allocated to the first IGEM grant. The commitment to the first grant will continue for the new grant.

**11. Additional Institutional and Other Sector Support.** N/A.

SUMMARY PROPOSAL BUDGET						
Name of Institution: Boise State University						
Name of Project Director: Amit Jain, Ph.D.						
A. PERSONNEL COST (Faculty, Staff, Visiting Professors, Post-Doctoral Associates, Graduate/Undergraduate Students, Other)						
Name/ Title	Salary/Rate of Pay	Fringe	Dollar Amount Requested (for 3 years)			
Xu, Dianxiang/Professor	\$119,205	\$36,954	\$468,500			
Dialani, Vijay/Associate Professor	\$101,026	\$32,328	\$400,100			
Sherman, Elena/Assistant Professor	\$88,380	\$30,049	\$355,200			
Cutchin, Steven/Associate Professor	\$101,026	\$32,328	\$400,100			
Graduate Research Assistants (5)	\$120,000	\$6,000	\$378,000			
<b>% OF TOTAL BUDGET:</b>	95%		<b>SUBTOTAL:</b>	\$2,001,900		
B. EQUIPMENT: (List each item with a cost in excess of \$1000.00.)						
Item/Description						Dollar Amount Requested
<b>SUBTOTAL:</b>						
G. TRAVEL:						
Dates of Travel (from/to)	No. of Persons	Total Days	Transportation	Lodging	Per Diem	Dollar Amount Requested
<b>SUBTOTAL:</b>						
H. Participant Support Costs:						
1. Stipends						
4. Other						
<b>SUBTOTAL:</b>						

I. Other Direct Costs:		Dollar Amount Requested
1. Materials and Supplies		
2. Publication Costs/Page Charges		
3. Consultant Services (Include Travel Expenses)		
4. Computer Services		
5. Subcontracts		
6. Other (specify nature & breakdown if over \$1000)		\$98,100
Graduate Student Fee Remission for 5 students		
<b>SUBTOTAL:</b>		\$98,100
<b>TOTAL:</b>		<b>\$2,100,000</b>
J. Total Costs: (Add subtotals, sections A through I)		
<b>TOTAL:</b>		<b>2,100,000</b>
K. Amount Requested:		
<b>TOTAL:</b>		<b>2,100,000</b>
Project Director's Signature: <i>Armit Jain</i>		Date: <i>4/22/15</i>
<b>INSTITUTIONAL AND OTHER SECTOR SUPPORT</b> (add additional pages as necessary)		
A. INSTITUTIONAL / OTHER SECTOR DOLLARS		
Source / Description	Amount	
Partial Graduate Student Fee Remission	\$72,889	
B. FACULTY / STAFF POSITIONS		
Description		
C. CAPITAL EQUIPMENT		
Description		
D. FACILITIES & INSTRUMENTATION (Description)		

## APPENDICES

- A. Facilities and Equipment
- B. Biographical Sketches and Individual Support
- C. Other (Letters of Support)

## APPENDIX A: FACILITIES AND EQUIPMENT

**Infolab:** Computer Science lab that works at the intersection of database systems, cloud computing and data science. The lab is working on projects that are addressing key research issues in the areas of: pattern recognition in large graphs, information diffusion in social media, data fusion in geo-spatial environments and real-time analytics. The lab is headed by Dr. Dialani and is staffed with six graduate research assistants and one postdoctoral associate.

**Computer Graphics and Visualization Lab:** The lab does collaborative research projects with INL, EPSCOR, campus partners, and local Idaho organization to research, enhance, and create new visualization techniques. This research focuses on the development of techniques for visualization of very large data sets at interactive rates on Tiled Displays, Immersive Displays, and head mounted displays such as GearVR and Oculus Rift. Several undergraduate and graduate research assistants staff the lab. The lab is headed by Dr. Cutchin.



**Software Engineering and Assurance Lab:** The Software Engineering and Assurance Laboratory has built a software-defined network, consisting of two servers, three openflow switches, and more than ten desktop and laptop computers. The computers are equipped with various software for software development and security testing. The lab is headed by Dr. Xu and Dr. Sherman and is staffed with six graduate research assistants and two postdoctoral associates.

**MetaGeek Linux Cluster Lab:** Most courses in the Computer Science curriculum are taught using the MetaGeek Linux instruction lab in ENGR 213/214. This lab includes 32 Linux computers that include a VMware Microsoft Windows installation on each unit. This laboratory is supported by MetaGeek, a Boise-based software developer that is a leader in the field of wireless network analysis software. MetaGeek continues to rely on graduates and current students of the Boise State computer science program as a key part of their workforce.

**Computer Science Tutoring Center:** The CS Tutoring Center, in room ENGR 111, hosts 30 workstations and gathering space for lower division CS students. Tutoring is available seven days a week. The CS Tutoring Center was setup using matching funds from the University.





**Beowulf Cluster Research Lab:** Located in room MEC 305 in the College of Engineering, the lab houses two clusters: Beowulf and Genesis. Dr. Jain is the lab director.

*Beowulf:* 59 nodes with 118 2.4-3.2 GHz Intel Xeon processors, 112 GB of memory, 13 TB of disk space, private Gigabit network and a Gigabit connection to the campus backbone. This cluster has been operational for seven years. About 479,000 jobs have been run, using up about 1.7 million hours of time. This cluster was funded by a research project managed by Paul Michaels (Geosciences) and Amit Jain (Computer Science).

*Genesis:* 16 nodes with quad-core Intel i7 processors, Nvidia GPUs, 192GB of memory, 80TB of disk space with Infiniband network as well as Gigabit network. Four nodes have Nvidia GPUs for co-processing. This cluster was funded by a research project managed by Tim Andersen (Computer Science) and Greg Hampikian (Biology).

Researchers from nine Departments (Biology, Geosciences, Materials Science and Engineering, Chemistry, Mathematics, Mechanical and Biomedical Engineering, Electrical Engineering, Civil Engineering and Communication) and three private companies (Crowley Davis Research, Baliwoo and Wasatch Wind) have used the cluster for research. This lab was initially funded by a National Science Foundation Major Research Infrastructure grant. Additional funding by FAA, DoD, NASA ISGC, Idaho State Board of Education, NIH, Crowley Davis Research, Baliwoo Inc. and Wasatch Wind.

## APPENDIX B: BIOGRAPHICAL SKETCHES AND INDIVIDUAL SUPPORT

### AMIT JAIN

Boise State University, Boise, Idaho 83725-2055  
phone: 208-426-3821, email: ajain@boisestate.edu

#### PROFESSIONAL PREPARATION

Indian Institute of Technology, New Delhi, Computer Science & Engineering, B. Tech., 1987  
University of Central Florida, Computer Science, Ph. D., 1994

#### APPOINTMENTS

2014-present: Associate Chair, Computer Science Department, Boise State University

2000-present: Associate Professor of Computer Science, Boise State University

2004-2013: Graduate Program Coordinator for Computer Science

Jan. 2007-May 2008: Chief Scientist, Baliwoo Inc.

2004-present: Director of Beowulf Cluster Laboratory

1994-1999: Assistant Professor of Computer Science, Boise State University

1987-1988: Software Engineer, Fermi National Accelerator Laboratory

#### SELECTED PRODUCTS

- *An Exploratory System for Collaborative Decision-Making in Community Planning*. Masters thesis, Aaron Wells, 2013 (Employed at Dell Foundation).
- *Hadoop and Hive as Scalable Alternatives to RDBMS: A Case Study*. Masters project, Marissa Hollingsworth, 2012. Software developed in collaboration with a local software startup company. (Employed at HP)
- *Android Application for Cluster Job Management*. Masters project, Chris Schance, 2012. Download app at <http://cs.boisestate.edu/~amit/research/pbs-app/>. (Employed at Micron)
- *Data Clustering Using MapReduce*. Masters project, Makho Ngazimbi, 2009. (Employed at Amazon)
- *Computer Science Vision*. Along with Tim Andersen, developed a 10-year vision statement for the department at the request of the University. The vision statement was distributed to industry at the Software Talent Initiative Workshop on 19th December, 2012.

#### OTHER SIGNIFICANT PRODUCTS

- *Designing Reliable High-Performance Storage Systems for HPC Environments*. Masters project, Lucas Hindman, 2011. (Employed at Baliwoo Inc)
- *An Interactive Simulation Tool for Complex Multilayer Dielectric Devices*, R. Southwick III, A. Sup, A. Jain and W. B. Knowlton, *IEEE Transactions on Device and Materials Reliability*, 2011.
- *New Applications of the Boise State Band Diagram Program*, R. J. Thompson, R. G. Southwick, B. A. Rapp, C. Buu, A. Jain and W. B. Knowlton, *IEEE International Integrated*

*Reliability Workshop*, 2011.

- *Conversion of the Band Diagram Program: A Look at Portability, Efficiency and Ease of Use*. Masters project, Mike Baker, 2010. Supervised jointly with Dr. Bill Knowlton from MSE department. (Employed at Micron)

#### SYNERGISTIC ACTIVITIES

- PI of CS10K: IDoCode project to train 30-40 high school teachers in teach high quality computer science in high schools. Build partnerships with school districts, industry groups and code.org. Conduct outreach events to K-12. Currently, the program has 30+ teachers from nine school districts.
- Lab Director for the Beowulf Cluster Lab at Boise State University, Amit Jain and his students designed and setup the cluster. Subsequently they helped convert dozens of research programs to run on the cluster for researchers from nine academic Departments and three private companies from Idaho.
- Consulting Scientists for Balihoo, Inc, a software company based in Boise. Research in large-scale data mining.
- Member of Software Alliance group, Idaho Technology Council, 2008 onwards.
- Organizing Committee Member: Boise Code Camp conference with over 600 attendees.
- Coordinator for *Computer Science I* course (2012-2015).
- Liaison for High School Concurrent Enrollment.

#### SELECTED FUNDING SUPPORT

- *Mobile Computer Science Principles Workshop*. Google CS4HS grant. PI: Amit Jain, Co-PIs: Tim Andersen, Alark Joshi, Marissa Schmidt, Jyh-haw Yeh. \$24,102. 2015.
- *CS10K: IDoCode: A Sustainable Model for Computer Science in Idaho High Schools*. National Science Foundation. PI: Amit Jain. Co-PIs: Alark Joshi, Tim Andersen, Jyh-haw Yeh, Jonathan Brendefur. \$992,067. 2014-2017.
- *S-STEM: Idaho Scholars in Engineering and Computer Science*. National Science Foundation. PI: Janet Callahan. Co-PIs: David Estrada, Amit Jain, Donald Plumlee, Thad Welch. \$626,375. 2014-2019.
- *Computer Science at Boise State: An Investment in Idaho's Future*. PI: Amit Jain. Co-PI: Robert Kustra. IGEM/HERC grant from State of Idaho. \$2,100,000. 2012-2015.
- *High Dielectric Constant Materials at the Nanometer Scale for Microelectronic Devices*. PI: Bill Knowlton. Co-PI: Amit Jain. HERC grant from State of Idaho. Amount \$75,000. 2008-2009.
- *Development of Tools to Enable the Port of Software to a Beowulf Cluster*. National Science Foundation Major Research Infrastructure Grant. PI: Paul Michaels (Geophysics), Co-PI and Lab Director: Amit Jain. Amount: \$299,882. 2003-2006.

## TIM ANDERSEN

Boise State University, Boise, Idaho 83725-2055  
phone: 208-426-5768 email: tandersen@boisestate.edu

### PROFESSIONAL PREPARATION

- Brigham Young University, Computer Science, B.S., 1992
- Brigham Young University, Computer Science, M.S., 1995
- Brigham Young University, Computer Science, Ph.D., 1999

### APPOINTMENTS

- 2013 - Present: Department Chair, Department of Computer Science, Boise State University.
- 2014 - Present: Professor, Department of Computer Science, Boise State University. •  
2007 - 2014: Associate Professor, Department of Computer Science, Boise State University.
- 2001 - 2007: Assistant Professor, Department of Computer Science, Boise State University.
- 1999 - 2001: Chief Scientist, IArchives, Orem, Utah.

### SELECTED PRODUCTS

- Budnikova, M., J Habig, D Lobo, N Cornia, M Levin, T Andersen, Design of a flexible component gathering algorithm for converting cell-based models to graph representations for use in evolutionary search, BMC Bioinformatics, 15:178, June 10, 2014.
- McDougal, O., N Cornia, S Sambasivarao, A Remm, C Mallory, J Oxford, M Maupin, and T Andersen. "Homology Modeling and Molecular Docking for the Science Curriculum." Biochem Mol Biol Educ. 2014 Mar-Apr;42(2):179-82. doi: 10.1002/bmb.20767. Epub 2013 Dec 20.
- Bullock, C., N Cornia, R B Jacob, A Remm, T Peavey, K Weekes, C Mallory, J T Oxford, O M McDougal, T Andersen (2013). "DockoMatic 2.0: High Throughput Inverse Virtual Screening and Homology Modeling", J. Chem. Inf. Model. 53, 2161-2170.
- Jacob, R., T Andersen and O McDougal (2012). "Accessible High Throughput Virtual Screening Molecular Docking Software for Students and Educators", PLoS Comput Biol 8(5), 1-5.
- Jacob, R., Bullock, T. Andersen, and O McDougal (2011). "Automated Peptide Analog Creation for High Throughput Virtual Screening", Journal of Computational Chemistry, 32: 29362941. doi: 10.1002/jcc.21864.
- Bullock, C., R. Jacob, O. McDougal, G. Hampikian, and T. Andersen, (2010). Dockomatic "Automatic Ligand Creation and Docking", BMC Research Notes 2010, 3:289.
- Andersen, T., R. Newman and T. Otter, (2009) "Shape Homeostasis in Virtual Embryos",

Artificial Life, Vol. 15, No. 2, Pages 161-183, MIT Press.

- Hampikian, G., and T. Andersen, (2007) "Absent Sequences", Proceedings of the Pacific Symposium on Biocomputing 12:355-366.
- Andersen, T., R. Newman and T. Otter, (2006) "Development of Virtual Embryos with Emergent Self-Repair", Proceedings of the AAAI Fall 2006 Symposium on Developmental Systems (Arlington, VA), pp. 16-23.
- Andersen T. L., and Martinez T. R. (2001). DMP3: A Dynamic Multi-layer Perceptron Construction Algorithm, The International Journal of Neural Systems, Vol. 11, No. 2, April 2001, pp. 145-166.

## SYNERGISTIC ACTIVITIES

- Dr. Andersen's lab has developed TAPP, a GUI application for manual and automatic classification and annotation of text documents.
- Dr. Andersen's lab developed ProtCalc - a web based application that allows users to enter multiple protein sequences, calculates several properties of the entered sequences, and displays the sequences in a spreadsheet-like interface that allows users to sort and rank the proteins on any selected criteria (<http://trac.boisestate.edu/protcalc/>).
- Dr. Andersen's lab has contributed to Gamera, an open-source platform for document recognition research. Specifically, Dr. Andersen's lab contributed the Tsai moment-preserving thresholding algorithm, gabor filtering, the White Rohrer thresholding algorithms, and several others.
- Dr. Andersen's lab has developed DockOMatic, a GUI application for automating creation, distribution, and management of ligand-receptor docking jobs on a Beowulf cluster.

## SELECTED FUNDING SUPPORT

- *ARC: Automata Processor for Research in Computing*. Idaho State Board of Education. PI: Vijay Dialani, Co-PI: Tim Andersen. \$50,988. 2015-2016.
- *EXPAND CS Expand Computer Science Industry and University Partnerships to grow the Workforce and Idaho's Economy*. Idaho Department of Labor. PI: Tim Andersen. \$1,000,000. 2014-2016.
- *Collaborative Research: CDI Type-1: A Computer Framework for Modeling Complex Pattern Formation*. National Science Foundation. PI: Jeff Habig, Co-PI: Tim Andersen. \$300,000. 2011-2014.
- *MRI: Acquisition of a GPU-accelerated High Performance Computing and Visualization Cluster*. National Science Foundation. PI: Inanc Senocak, Co-PIs: Tim Andersen, Julie Oxford, HP Marshall, Peter Mullner. \$555,384. 2012-2015.

## JIM CONRAD

Boise State University, Boise, Idaho 83725-2055  
phone: 208-426-2485 email: jimconrad@boisestate.edu

### PROFILE

Industrial research on improving the quality of legacy code, defect removal models, regression test selection algorithms, Monte-Carlo approaches to project estimation, and modeling reliability as a function of quality. Teaching interests include software engineering, software project management, and computer networking.

URL <http://coen.boisestate.edu/jconrad>

### ACADEMIC EXPERIENCE

#### VISITING LECTURER and ASSISTANT CLINICAL PROFESSOR

*Boise State University* 2012-2015 Taught CS119 Introduction to Java, CS125 Introduction to Computer Science I, CS221 Introduction to Computer Science II, CS230 Computer Ethics, CS425 Introduction to Computer Networks, and CS471 Software Engineering, and CS481 Senior Design Project.

#### ADJUNCT PROFESSOR

*Boise State University* 2004, 2010-2012  
Taught CS471 Software Engineering and CS119 Introduction to Java.

#### RESEARCH ASSISTANT AND SR. SYSTEMS ANALYST

*University of Missouri Rolla* 1973-1981  
Accelerated an implementation of the Cooley-Tukey Fast Fourier Transform algorithm by nearly an order of magnitude. Implemented a research computer network and a Computer Aided Design graphics system.

### INDUSTRY EXPERIENCE

#### SOFTWARE DESIGN ENGINEER EXPERT

HEWLETT-PACKARD; BOISE, ID 1985-2011

Developed a forward-chaining, rule-based system to reduce hardcopy device maintenance costs. Invented a method to remotely manage USB-connected hardcopy devices, led international development and testing of the product. Led a 10X quality improvement of a 600 KLOC legacy software product with 50,000 downloads per month. Developed Monte-Carlo forecasts of milestones, resources and metrics for software projects.

Advanced LaserJet Operation: Developed a test selection algorithm and test management system to deliver firmware with 10% of the legacy acceptance test effort. Led instrumentation of the Color LaserJet's test coverage. Managed the Color LaserJet 5 firmware team, releasing in 58% of the COCOMO expected calendar time. Built a Monte-Carlo simulation to estimate firmware schedule.

Managed development of Internet printing technologies including the Internet Printing Protocol, late binding to the target device, and eMail as a store-and-forward transport.

Supervised undergraduate/graduate internships investigating future technologies (rule-based systems, performance modeling, Internet printing) of long-term interest.

Network Printer Operation: Invented technologies to embed network services in the LaserJet IIIsi. Developed a test strategy achieving 77% statement coverage. Developed an incremental life-cycle to deliver preliminary, committed and aspirational features. Completed the project on schedule with aspirational features.

Colorado Network Operation: Prototyped the LAN Manager server on UNIX. Negotiated the architecture of the LAN Manager X server with Microsoft. Led HP's server product design team using a pioneering agile life-cycle to deliver 115 KLOC of tested code with only 52% of the COCOMO expected effort. Implemented client-side networking code, later incorporated into Microsoft Windows for Workgroups.

## EDUCATION

*University of Idaho – PhD Computer Science, 2010*

*University of Idaho — MS Computer Science, 1985*

*University of Missouri Rolla — BS Electrical Engineering, 1975*

## PUBLICATIONS & PATENTS

Other: J. R. Conrad and P. W. Oman. *Evidence for Self-Organized Criticality in Malware Attacks on the Internet*. Technical Report. 2010.

Refereed Journal: Conrad, James R and Alves-Foss, Jim and Lee, Sauchi Stephen. "Analyzing Uncertainty in TG Protection Graphs with TG/MC." *Journal of Computer Security*. V18. N5. 2010.

Other: J. R. Conrad. *Using Statistical Simulations to Analyze Uncertainty in Computer Security Investments, Mitigations and Vulnerabilities*. PhD Dissertation. University of Idaho. 2009.

Refereed Conference: J. R. Conrad. "Analyzing the Risks of Security Investments with Monte-Carlo Simulations." *Fourth Workshop on the Economics of Information Security*. Harvard University. 2005.

Refereed Conference: J. R. Conrad, P. W. Oman and C. Taylor. "Managing Uncertainty in Security Risk Model Forecasts with RAPSA/MC." IFIP 11.1 and 11.5 Joint Conference. 2005.

Patent: M. Gunning and J. Conrad. "Method for executing programs within expanded memory of a computer system using MS or PC DOS." USPO 5123098.

Patent: T. Barry, G. Robbert and J. Conrad. "Portable, resource sharing file server using co-routines." USPO 527687

## SELECTED FUNDING SUPPORT

Google \$5000 Award (2014): Selected for high quality Computer Science Education.

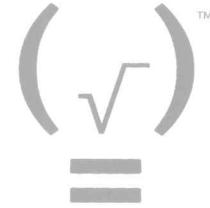
## APPENDIX C: OTHER (LETTERS OF SUPPORT)

Attached letters:

1. *Brad Wiskirchen*, CEO, Keynetics, Inc.
2. *Ward Parkinson*, CEO, Ovonix (founder and initial CEO, Micron Technology)
3. *Jim Nottingham*, Vice President and General Manager of Laserjet, HP.
4. *Troy Manning*, Director, Advanced Memory Systems, Micron Technology.
5. *Paul Price*, CTO, Baliwoo Inc.
6. *Todd Weible*, CIO, PinnPointe Consulting and Impact Sales Inc.



April 13, 2015



Higher Education Research Council (HERC)  
Idaho State Board of Education  
P.O. Box 83720  
Boise, ID 83720-0037

keynetics™

RE: Letter in Support of the IGEM Proposal

917 S. Lusk St.  
Ste. 300  
Boise, ID 83706

Distinguished Members of the HERC:

p: 208 489 3300

As the CEO of Idaho's largest privately held technology company (by revenue), I want to express my support for the new IGEM grant proposal as it relates to the computer science program at Boise State University.

keynetics.com

Keynetics has two operating subsidiaries, ClickBank and Kount. ClickBank is one of the Internet's largest digital goods retailers. We sell tens of thousands of digital products each day to consumers in over 180 countries. Kount is the premier provider of fraud control services for Internet transactions. The world's largest online retailers use Kount's services, and Kount is the exclusive fraud control solution for Chase Bank's Paymentech division—which processes 51% of the world's card-not-present transactions. Kount is also the exclusive fraud control solution for Braintree—PayPal's payment gateway.

Considering the nature of Keynetics' businesses, it is vitally important that we have access to well-trained software developers. Unfortunately, the talent pool in Idaho is quite limited due to the number of annual graduates from the Boise State's computer science program. But that has been improving since the HERC grant of \$2.1M (and matching money from Boise State). Using that money, Boise State's team has:

- Hired four faculty members in software engineering, databases, and visualization;
- Increased the number of research proposals and grant funding;
- Increased the number of program graduates from 25 to 50; and
- Established a heavily used computer science tutoring center.

The members of the Boise State team would like to use the next grant to help continue this momentum. And as a representative of "industry", I can assure you that Keynetics, and other technology companies, would welcome that continuation.

In short, expansion of Boise State's computer science program is vital to the growth of Idaho's economy. And providing Boise State with resources like those set forth in the new IGEM proposal is a condition precedent to the expansion of that program. Hopefully, with additional grant support from HERC, companies like Keynetics can cease hiring highly compensated computer science graduates from institutions outside Idaho, and close down operations in cities outside the Gem State, and concentrate on growing Idaho-centric businesses.

Please help Keynetics, and other Idaho technology companies, expand and continue to excel in our great state.

Thank you for your time and consideration.

Sincerely,

A handwritten signature in black ink, consisting of a large, loopy initial 'B' followed by a long, horizontal stroke that tapers to the right.

Bradley J. Wiskirchen  
CEO, Keynetics Inc.

**WARD PARKINSON**

Ovonyx, Inc.

300 Main St, #111

Boise, ID 83702

208-850-5577; [WParkins@aol.com](mailto:WParkins@aol.com)

Attorney and Member of Bars in Idaho and  
U.S. Patent and Trademark Office

April 9, 2015

Higher Education Research Council (HERC)  
Idaho State Board of Education  
P.O. Box 83720  
Boise, ID 83720-0037

Re: Letter in Support of the IGEM Proposal

Distinguished Members of the HERC:

As a co-founder of Micron and its initial CEO, I soon became aware of the importance of nearby education for our employees and future employees. My experience was that within 3 years, the employees actively sought additional education in support of their work and career. However, the industry experience (and Micron's) was that an employee who left town to obtain that education returned only half the time, even if the employer paid for the education. Even then, the employee's career was adversely impacted for being gone due to the rapid product and process changes. Our best experience was meeting that need locally - so very important.

Initially this was done by building the Simplot-Micron building at BSU and delivering distance learning from Stanford and Chico State. These remotely delivered courses evolved to an on-campus engineering school at BSU. As we say, it takes a village and Micron was so grateful for BSU stepping up to meet our need with the support of your body as the program became accredited under the able leadership of Dr. Russell, Dr. Moll, and the many others who assisted delivering a quality education for the students.

I took some Fortran undergraduate and my first professional stint at programming was Intel's initial funded startup - Reticon (the first commercial camera chips). I brought the first non-contact measurement system into General Motors that used an early micro-processor. Talk about exciting - they broke ground on a related facility the next week! As my career evolved into memory design of large chips, I was constantly in search of faster computers and programming methods to handle the simulations. I was thrilled when Dr Ron Rohr moved to Boise - pioneer of the Spice program at Carnegie Mellon that we all use to execute designs (and honored as an IEEE fellow on the recommendation of Dr. Jake Baker).

I have always appreciated the importance of programming and was delighted when Dr. Amit Jain and others at BSU Computer Science approached me to assist them with their planning, as Computer Science transitioned into the Engineering School. Along the way, they encouraged me to take courses in modern programming for mobile devices (Java) to experience their education approach and the wonderful support. I have done that and after initially falling behind in the lab and having to drop out, I am now close to successfully finishing the 2nd of a series of 4 programming classes they recommend. It has been an eye-opener. I have experienced the outstanding quality of the professors (now 3). More importantly, I appreciate the labs and round-the-clock student support so necessary to learn by doing. In the lab, about 1/3 of the time I am sitting next to a high school teacher who is learning to program and teach (nicely ahead of Arkansas who will shortly require computer science competency to graduate high school).

I recommend the BSU computer science program to you and thank you for your support of expansion to meet the need - a need growing almost explosively with the internet and now smart mobile devices that allow any child (or adult) to write a successful "app" - talk about making a world of opportunity for all. But we need the skill to do so. I got that opportunity early on and I know it was crucial to building my confidence to start Micron.

In particular I write in support of the continued IGEM grant to BSU. I used to say in raising money for Micron that there is no guarantee on the investment but we will give you a good run for your money. A good run comes to mind as I think of the wonderful progress at BSU in computer science that this funding has enabled. Despite concerns about ability to recruit faculty, the money has been used successfully as I personally get to experience:

- Hired four outstanding faculty in software engineering, databases and visualization
- Increased number of research proposals and grant funding substantially
- Increased number of graduates from 25 to 50
- Established a heavily used CS tutoring center

I sincerely believe they will well use another grant if available to help continue that momentum and progress to the full benefit of the students and Idaho. Frankly, I audit the classes because they are so full that I don't want to take a spot necessary for a student matriculating. Even with full classes, the experience is excellent and I know will be improved with more staff, support in the labs, and a broader offering in this fast changing field. Thanks again for considering renewal of their grant.

Regards



Ward Parkinson

Hewlett-Packard Company  
11311 Chinden Blvd  
Boise, ID 83714  
USA

hp.com



April 20 2015

Higher Education Research Council  
Idaho State Board of Education  
P.O. Box 83720  
Boise, ID 83720-0037

RE: Letter in support of the IGEM proposal

HP is embracing the “New Style of IT” driven by big data, cloud storage, digitization and mobility, all of which are creating significant disruptions in the marketplace which all companies must adapt to and leverage in order to remain competitive. With these rapidly changing and expanding technologies, and as one of Boise’s largest high-tech firms, and the largest single employer of software developers in the state of Idaho, it is vitally important to HP to have a large and sustained local pipeline of new, well-trained software engineering talent. To this end HP has worked with the Computer Science department at Boise State to assist the department in increasing the number of graduates, and to promote and support research and education programs within the Computer Science department that have significant value for HP (and other companies), such as cyber-security, big data analytics, and cloud and mobile computing.

Given these efforts, HP is very pleased to hear of the progress that has been made in the Computer Science department at Boise State University, much of which can be attributed to the first round of funding that they received 3 years ago through IGEM. This progress includes:

- doubling the typical number of graduates (25) to approximately 50 this year, and with projections of 70-90 graduates next year
- established an undergraduate, trans-disciplinary minor in cyber-security, and a planned cyber-security track in the planned PhD in computing
- planned graduate programs in Big Data Analytics
- undergraduate courses in mobile applications, cyber-security, big data analytics, and cloud computing
- significantly improved retention of undergraduates in lower division cs courses
- programs for training high school teachers to teach CS, and other outreach efforts in k-12 to promote computer science education.

April 20, 2015

HP believes that the progress that has been made by the CS department at BSU in the last 3 years is astounding, and we want to do everything we can to support the momentum that they have created. We think that the continued success and growth of the CS department is vitally important for HP, and for a multitude of other companies in Idaho, and will have a significant, transformative economic impact on the Boise metro area and Idaho. For this reason we whole-heartedly support the continuation of the IGEM grant.

Sincerely,

A handwritten signature in blue ink, appearing to read "Jim Nottingham", enclosed within a hand-drawn, irregular blue oval.

Jim Nottingham  
Vice President and General Manager  
LaserJet Enterprise Solutions  
Value Hardware & Technology Business  
HP, Boise Idaho



April 21, 2015

To Whom It May Concern,

I am writing in support of renewing the IGEM Grant for Computer Science at Boise State University. Micron has a long and storied history of supporting Boise State University and its education programs and, specifically, the computer science department.

While machine capabilities and user interfaces have continued to evolve over the last 30 years, the technology industry's basic premise has not changed; the premise being that semiconductor performance and power improvements are driven by the fabrication process and shrinking "chip" geometries. Over the next 10 years, this premise will fundamentally begin to change. We are approaching with clarity the physical limits of the transistor as we know it, with many projecting "the end of Moore's Law" between 2020 and 2025. The rapid pace of this historic evolution has already shown signs of slowing.

In order for the semiconductor industry to remain healthy and robust, the field of computer science must expand dramatically. Fundamental computer hardware architecture and software sciences will become the backbone of machine capabilities, which will enable advancements such as new user interfaces and data analysis techniques.

The field of computer science and the ability of universities to create an environment whereby students and faculty can expand and accelerate their learning and research, and deliver a commercial impact, is substantially enhanced by programs such as IGEM's support of computer science at Boise State University.

The demand for students educated in the field will only increase as the aforementioned transition of technology occurs, and having such a resource available through Boise State University will create the knowledge and talent pipeline required to continue to produce the performance and capability improvements the world has come to expect from the technology industry.

Best Regards,

A handwritten signature in black ink, appearing to read "Troy Manning". The signature is fluid and cursive, with a long, sweeping underline that extends to the right.

Troy Manning  
Director, Advanced Memory Systems  
Micron Technology

April 20, 2015

**Balihoo**

Higher Education Research Council  
Idaho State Board of Education  
P.O. Box 83720  
Boise, ID 83720

## IN SUPPORT OF THE IGEM PROPOSAL

As a leader in the Idaho software industry and as a former student and graduate of Boise State's Computer Science program I am writing to voice my enthusiastic support for the proposed allocation of IGEM funds to the Computer Science department.

For the past 10 years the program has been a critical partner to Baliaroo; more than half our software developers and systems engineers are Boise State CS graduates. Baliaroo's engineering team is the lifeblood of our software business; we set a very high standard for each recruit. The CS program at Boise State consistently delivers the caliber of graduates and alumni that we need to grow our business.

The average salary of our CS grads is over \$100K. Each software developer we add to the ecosystem results in an increase to Idaho's standard of living and average wage. In our experience, each CS job directly results in approximately 7 additional jobs (sales, account managers, accountants, HR, designers, product and project managers, etc), with an average of \$70K salary. As our business grows, we'd like to keep wages in Idaho by hiring locally. Our ability to hire locally is directly correlated to the success of the CS program.

The quantity of graduates from the program has dramatically improved, but still has not kept up with growing market demand. We are forced to recruit from outside of Idaho to grow our team. At each board meeting our investors question our ability to continue to grow the team in Boise. There is persistent pressure to establish a development team outside of Idaho in markets that have a larger supply of talent. We have been able to resist that pressure by recruiting developers from outside of Idaho and the US to move to Idaho. We also recruit developers away from other Idaho companies - which is net neutral to supply. The growth of demand for qualified software professionals needs to be reflected in an increased, local supply. This grant is imperative to keeping pace with that demand.

As a supporter of the first IGEM proposal we are keenly aware of the deployment and results of those dollars. The department has recruited outstanding new faculty members, increased matriculation, and doubled the number of graduates. To date, this grant has been a remarkable investment; it calls for follow-on investment to maintain and further expand program, enabling our state to keep pace with increasing demands.

Sincerely,



Paul Price  
CTO, Baliaroo





Todd Weible  
PinnPointe Consulting & Impact Sales, Inc.  
915 W Jefferson St.  
Boise, ID 83702  
April 21, 2015

Higher Education Research Council  
Idaho State Board of Education

To whom it may concern:

As a graduate in Computer Science from Boise State University, an employer of multiple interns and graduates from the program, and the CIO of PinnPointe and Impact Sales (ISI) based In Boise, Idaho, I would like to express my appreciation for what the legislature and the state have done to support Boise State University's Departments of Engineering and Computer Science as part of the critical mission the Idaho Global Entrepreneurial Mission (IGEM) is fulfilling in the State of Idaho. Additionally, I would recommend and support the granting of further financial resources being requested currently.

Both PinnPointe and ISI are owned by long-time residents of the Boise community and operate within the Retail Grocery industry. As companies that are not in the Software Industry proper, it is important to us that the IGEM Council be aware of how broadly Boise State University's computer scientists reach our Boise, Treasure Valley, and Idaho economies. The growth and success of the Computer Science Department at Boise State is critical to fulfilling the needs of our economy and keeping these high paying, high contributing jobs in the state.

The IGEM grant has been very successful in allowing the Department of Computer Science to expand its bandwidth over the past 2 years and we have seen the direct benefits of this growth. In the 2014-15 school year, we have hired two interns who are scholarship recipients through the program that was funded by the joint efforts of government and the private sector. I could not say enough about the quality of students being attracted to the program, nor the quality of education they have received thus far. These two employees are exceptional examples of what I know is happening all over the Treasure Valley through this program.



*Impact Sales, Inc.*

As an owner of Boise based companies, a resident of the city of Boise, and an employer in need of an expanded Computer Science Department at Boise State University, I support the proposal before you and encourage IGEM's reciprocal support of our community and State, by approving and authorizing it. The previous funding accomplished all of its intended goals by doubling the number of Computer Science graduates, funding 4 additional faculty members, and increasing the collaboration between our industries and our higher education system. Continued and further investment now will resound within our economy for years to come and I thank you for your consideration of the needs of our state, our city, and the companies of the Treasure Valley that are committed to continued partnership and growth in conjunction with the Computer Science Department of Boise State University.

Sincerely,

A handwritten signature in blue ink, appearing to read 'Todd Weible', is written over a light blue horizontal line.

Todd Weible  
CIO

[tweible@pinpointe.com](mailto:tweible@pinpointe.com)