


COVER SHEET FOR GRANT PROPOSALS

State Board of Education

SBOE PROPOSAL NUMBER: (to be assigned by SBOE)		AMOUNT REQUESTED: \$700,000 per year for three years totaling \$2,100,000	
TITLE OF PROPOSED PROJECT: Computer Science and Boise State University			
SPECIFIC PROJECT FOCUS: Expansion of the Boise State University Computer Science Department to help meet compelling state economic development, research, and workforce needs			
PROJECT START DATE: July 1, 2012		PROJECT END DATE: June 30, 2015	
NAME OF INSTITUTION: Boise State University		DEPARTMENT: Computer Science Department	
ADDRESS: 1910 University Drive, Boise, ID 83725			
		E-MAIL ADDRESS: ajain@boisestate.edu	PI PHONE NUMBER: 426-3821
NAME:		TITLE:	
SIGNATURE:			
PROJECT DIRECTOR	Robert Kustra	President	
CO-PRINCIPAL INVESTIGATOR	Amit Jain	Associate Professor, Computer Science Department	
CO-PRINCIPAL INVESTIGATOR			
CO-PRINCIPAL INVESTIGATOR			
NAME:		SIGNATURE:	
Authorized Organizational Representative	Mark J. Rudin		

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 expand and restructure 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	Dr. Robert Kustra, President, Boise State University Dr. Amit Jain, Associate Professor, Computer Science Department, College of Engineering, Boise State University
3.	Objectives	Expand and restructure the Computer Science Department at Boise State University to: <ol style="list-style-type: none">1. Recruit and retain research faculty and staff2. Increase partnerships with local companies to facilitate knowledge development and transfer3. Increase research grant funding4. Produce more computer science graduates that qualify for software and related technical positions in Idaho
	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 (2011-2016) recently developed by the Vice Presidents for Research at the three Idaho Universities. The plan identifies strategic research areas with 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 expansion of its Computer Science Department as one of its top institutional priorities to meet the research and workforce development needs of industry. The University's commitment to this effort is further affirmed by the significant resources it has allocated to this proposed initiative. Besides providing competitive start-up packages to recruit faculty, the University has also committed institutional support in the form of teaching assistants and a new specialized computer science tutoring center to further ensure the successful completion of project objectives. The University will continue to pursue state funding throughout the duration of this project as a long term funding option.

5. Specific Project Plan

The project plan involves three strategies for the Boise State University Computer Science Department (the 'Department'). The first strategy will involve hiring additional Department faculty to grow research, industry collaboration and teaching capacity. The second strategy involves promoting greater integration and collaboration between the Department and industry. The third strategy will focus on the student pipeline through tactics to attract, retain and graduate additional high-quality students.

Strategy One: Hiring Faculty. Boise State University will hire four additional high-quality computer science research faculty supported by five graduate research assistants. The Department will seek faculty who have the ability to obtain research funding and whose research has high potential for partnerships with industry. Facilitating the development of new products and services will enhance the competitiveness of these companies, and ultimately, lead to the economic growth of Idaho.

The University will also make significant additional infrastructure enhancements to help support faculty recruitment and retention. Please see Section 10 and budget for more details on institutional support and funds from the University. In particular, IGEM funding will be used to target faculty in *databases* and *software engineering* specialties. These fields have always been among the more difficult recruitment areas as a result of the high industry demand for computer science PhDs.

Strategy Two: Tighter Industry Integration. University and industry partnerships are vital to the technology transfer process. The Boise State Computer Science Department is already building on solid industry partnerships and initiatives. A more robust faculty engaged with industry will more rapidly grow these initiatives, turn them into a product, move them out of the university and into the marketplace. The transfer of new knowledge and intellectual property is a complex endeavor that depends on both formal and informal collaborations of many individuals and institutions.

Growing partnerships with industry. Boise State University will support and encourage Computer Science faculty to establish partnerships with industry via joint research projects, service on industrial boards, consulting and faculty and student involvement in new company startups. The Department will introduce new faculty and students to existing industrial connections with events such as *Code Camp* (hosted by the Department) and *develop.idaho*, where they can connect with industry and entrepreneurs. Both events drew around 400 participants this year.

Growing Industry Participation in the Curriculum. The Department will build on existing industry involvement with workshops such the Freshman *CS Extras* Seminar and the Mobile App Development Workshops, seminars, industry visits to classrooms and internships.

Growing the Industrial Advisory Board. The Department will expand its industrial advisory board to reflect the growth of new software companies in the Boise area and secure closer ties with local industry

Strategy Three: Enhancing the Student Pipeline. The third strategy will focus on the student pipeline through tactics to attract, retain and graduate a larger number of high-quality students. The technology sector is and will be a critical component of Idaho's future knowledge-based economy which relies on software engineers for maintaining and growing its competitiveness. Computer science engineers, information management and software development professionals are also important to Idaho's multinational companies, since information technology is vital to their operations as well.

Improved Entry. Computer Science is a challenging academic discipline resulting in retention issues, particularly in lower-division courses. Therefore, to increase the total number of successful students, the Department intends to restructure the first two undergraduate Computer Science classes into three classes to allow students more time to absorb the material.

Improved Time to Graduation. As part of a University-wide initiative to meet increasing demand for Computer Science graduates from industry and others, the Department recently reduced the number of credits required for a B.S. degree from 128 to 120. This change recently helped two students to graduate early. In the fall, the university will implement a new university-wide core curriculum. The Department will continue to encourage students to familiarize themselves with new credit hour requirements.

Maintain Curriculum Currency and Quality. The Department will build on increased faculty expertise in databases and software engineering specialties to enhance the current curriculum. In addition, the full curriculum will be revisited in the first year of the project to identify other

places to maintain and improve quality while increasing retention and progress. Curriculum changes based on this review will be proposed in the second year of the project.

Improved Tutoring and Advising. In 2011, the Boise State University College of Engineering created a central Engineering Advising Center for engineering and computer science majors. The Engineering Advising Center will have primary responsibility for advising Computer Science students during their first two years. Computer Science faculty will advise upper-division students and focus on mentoring and career planning. In addition, the University will establish a Computer Science Tutoring Center specialized for computer science students. The Computer Science Tutoring Center will ramp up from three teaching assistants in the first year to nine in the third year of the project. It will be modeled after successful tutoring centers at other Universities. The Computer Science Tutoring Center will also help build a sense of community among the lower division computer science students, which is another important component in retention.

6. Potential Economic Impact

As described in the Strategic Research Plan for Idaho Higher Education (2011-2016), focused research efforts and resources in high impact areas such as information management and software development will be the most efficient and effective route to state-wide economic development. This proposal's investment in the recommended three strategies will result in increased collaborations with industry, more externally funded research and Computer Science students and graduates. This project is designed consistent with the vision of IGEM and is designed to leverage the combination of private-industry guidance and the talent and expertise of faculty to commercialize innovative and viable technologies that will strengthen Idaho's economy.

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.

Potential Economic Impact: Serving Immediate Workforce Needs. Graduates with computer science degrees are in high demand in the state, which is home to hundreds of established software companies, such as BaliHoo, Healthwise, WhiteCloudAnalytics, Clearwater Analytics, Keynetics, Cradlepoint, MarkMonitor, MetaGeek and Tsheets.com, just to name a few. Global giant Microsoft Corporation also operates in Boise after having acquired ProClarity, a local business intelligence software company. Many of these software companies have been recognized for their contributions as innovators and economic engines.

The Idaho software industry is poised to grow, but is limited by the small supply of qualified computer science graduates and professionals. More than 90% of Boise State computer science graduates prefer staying in the Boise Metro area, and local industry actively seeks these students. Many of these students will have job offers before graduation, and they command among the highest starting salaries of any major. Boise State faculty and graduates have also been involved in leadership roles in Boise-based companies like BaliHoo, MetaGeek, PinnPointe and Scentsy.

According to the Idaho Department of Labor, there are over 1,000 open positions in computer science and related technical fields in the city of Boise, Meridian and Nampa during an average 120-day period. These jobs represent more than 10% of the total open jobs in the state and one of the largest employment gaps in Idaho. Unless we are able to increase the number of qualified graduates in computer science and related technology fields, this gap will likely widen. The Idaho Department of Labor projects that open positions in these critical fields will increase by 12% within five years. At the same time, unemployment in the Boise metropolitan statistical area remains high at 8.5% and overall economic growth remains stagnant. Many state sectors acknowledge that a shortage of qualified workers to grow Idaho's knowledge-based economy is having a significant and detrimental impact, particularly in computer science.

Potential Economic Impact: Keeping Technology Companies in Idaho. Another disquieting concern is anecdotal evidence suggesting that local technology companies are choosing to open offices in other regions of the country or hire out of state workers because they can't find enough qualified Idaho workers to meet business needs. For example, Keynetics, which describes itself as the largest privately held tech company in the State of Idaho, opened an office in Boulder, Colorado, "to get access to IT/Developer talent," according to company leadership.

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. For instance, WhiteCloud Analytics has announced openings for three software development and information technology positions in the coming year. According to the company's leadership, "We are seeking good local talent, however we don't want to poach from other local high tech companies.... We will expand our search outside of Idaho if we can't meet our hiring needs." The shortage of computer science workers also impacts Idaho's multinational

companies. For example, JR Simplot had six open positions in computer science and related technology fields at the end of January 2012, according to the Idaho Department of Labor. Some employers speculate about the additional jobs created by each software engineer hire. Pete Gombert, Chief Executive Officer of Baliho, mentions in his support letter that each software engineer hired results in six additional support hires. Areas such as Portland, Oregon and Salt Lake City are reportedly on the radar of other Idaho technology companies because of their larger skilled workforces. As Idaho's neighboring states add new phases to their comprehensive plans to grow their technology sectors, the demand for skilled technology workers will continue to increase in the years ahead. Investing in Boise State's computer science program now will ensure that Idaho companies will be able to fuel growth with this critical human capital.

Boise State requests IGEM funding to invest in additional research faculty in the Computer Science Department, with the ultimate goal of enhancing university and industry partnerships and commercialization opportunities, expanding computer science research and program offerings, and producing more graduates – all efforts designed to benefit Idaho's economy.

7. Criteria for Measuring Success

To evaluate success the following metrics will be used:

- The number of recruited and retained Computer Science Department faculty
- The number of partnerships between the Computer Science Department and local industry
- The dollar amount of externally funded research grants procured by Computer Science Department faculty
- The number of qualified computer science students and the number of computer science graduates over three years.

- The placement rate of students and graduates and the percentage staying in Idaho

8-9. Budget and Budget Justification

The success of this project depends on expanding and enhancing the Computer Science Department. A larger, dynamic faculty will help build the environment required to launch and sustain new Department initiatives. Increasing the number of faculty, enhancing the breadth of expertise, and offering increased education, research, and commercialization opportunities will increase the quantity and quality of incoming students, and help to retain current students.

A. Faculty and Staff. Funds are requested for four tenure track Computer Science Department faculty in each program year. Costs for the faculty are based on an annual salary of \$100,000 with an anticipated 3% increase in each of years 2 and 3. The three year total salary request is \$309,090 per faculty, totaling \$1,236,360 for the three year project.

D. Graduate/Undergraduate Students. Funds are requested for five Graduate Assistants. The Graduate Assistant stipend is \$2,000 per month and tuition remission is provided (see "I. Other Direct Costs"). 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.

E. Fringe Benefits. The fringe benefit request for the Computer Science faculty is 30% of salary, and includes retirement, health, dental and life insurance and employment taxes. The fringe benefit request for the Graduate Assistants covers employment taxes and averages 6% of salary. The total three year project fringe benefit request is \$392,508.


I. Other Direct Costs. Funds are requested for partial Graduate Assistant tuition and fee remission. Year 1 tuition and fees are \$8,587 per Graduate Assistant, the projected cost for academic year 2012-2013. This is a 5% escalation over the current academic year 2011-2012

amount of \$8,178. Years 2 and 3 use the same 5% escalation rate. Partial tuition and fee remission request for five Graduate Assistants is \$42,935 in year 1, \$37,200 in year 2 and \$21,132 in year 3, totaling \$101,267 for the three year project. (The balance of Graduate Assistants tuition/fees required for the three year period totaling \$34,084 will be provided by Boise State University funds as described in the Institutional and Other Sector Support section below.) \$9,865 is requested in year 1 to partially offset faculty recruitment costs. This includes advertising and travel expense reimbursement for candidates.

K. Amount Requested. Total request is \$2,100,000.

10. Institutional and Other Sector Support

Boise State commits to provide the start up funds needed for the new faculty hires and additional teaching assistants to establish a tutoring center to help with retention of computer science students. Boise State commits to build the infrastructure of the Department with enhanced support for computer science students, and enhanced support for research via additional operating expenses and equity.

SUMMARY PROPOSAL BUDGET						
Name of Institution: Boise State University						
Name of Project Director: Dr. Robert Kustra and Dr. Amit Jain						
A. FACULTY AND STAFF						
Name/ Title	Rate of Pay	CAL	No. of Months		Dollar Amount Requested	
			ACA	SUM		
To Be Hired / 4 Computer Science Faculty	\$100,000/year		9		\$1,236,360	
% OF TOTAL BUDGET: 59%		SUBTOTAL:			\$1,236,360	
D. GRADUATE / UNDERGRADUATE STUDENTS						
Name/ Title	Rate of Pay	CAL	No. of Months		Dollar Amount Requested	
			ACA	SUM		
To Be Hired / 5 Graduate Assistants	\$24,000/year	12			\$360,000	
% OF TOTAL BUDGET: 17%		SUBTOTAL:			\$360,000	
E. FRINGE BENEFITS						
Rate of Pay (%)		Salary Base			Dollar Amount Requested	
4 Computer Science Faculty 30%		\$100,000/year			\$370,908	
5 Graduate Assistants 6%		\$24,000/year			\$21,600	
SUBTOTAL:					\$392,508	
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)						
Recruitment Costs (Advertising and travel expenses in Year 1 only – partial funding request					\$ 9,865	
5 Graduate Assistant Partial Tuition and Fee Remission					\$101,267	
SUBTOTAL:					\$111,132	
J. Total Costs: (Add subtotals, sections A through I)					TOTAL: \$2,100,000	
K. Amount Requested: \$700,000 per year for three years					\$2,100,000	
TOTAL:						
Project Director's Signature: 					Date: 4/23/12	

INSTITUTIONAL AND OTHER SECTOR SUPPORT

(add additional pages as necessary)

A. INSTITUTIONAL / OTHER SECTOR DOLLARS

Source / Description	Amount
BSU: Faculty Start-up packages (\$150,000/faculty -- \$50,00/faculty/year) – one-time	\$600,000
BSU: Tutoring Center. Remodel (\$100,000). Workstation purchase (30@\$2,000 ea) – one-time	\$160,000
BSU: Teaching Assistantships. 3,7,9 positions (\$18,000/9 month salary plus fringe/tuition) -- ongoing	\$536,598
BSU: CS Department Operating Expense (OE, travel, recruiting) -- ongoing	\$230,135
BSU: Partial GA Tuition/Fee Remission -- ongoing	\$ 34,084
BSU: Other Personnel Costs	\$237,777
Institutional support for the three year duration of the project \$1,798,594	

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

The Computer Science Department uses the labs described below.

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.

Beowulf Cluster Research Lab: Located in room MEC 305 in the College of Engineering, the lab houses two clusters: Beowulf and Genesis. Amit Jain (Computer Science) 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,

Balihoo 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, Balihoo Inc. and Wasatch Wind.

Computer Science Research Lab: Housed in room MEC 302R. Supports research needs for Computer Science faculty (currently Tim Andersen, Gang-Ryung Uh and Alark Joshi). The lab consists of various machines and space for graduate and undergraduate students involved in various research projects.

APPENDIX B: BIOGRAPHICAL SKETCHES AND INDIVIDUAL SUPPORT

AMIT JAIN

Boise State University, Boise, Idaho 83725-2075
phone: 208-426-3821, email: ajain@boisestate.edu

EDUCATION

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

PROFESSIONAL EXPERIENCE

2000-present: Associate Professor of Computer Science, Boise State University
2004-present: 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

PUBLICATIONS AND RELEVANT EXPERIENCE

SELECTED SUPERVISED SOFTWARE PROJECTS

- *Designing Reliable High-Performance Storage Systems for HPC Environments*, MS thesis by Lucas Hindman, 2011.
- *Conversion of the Band Diagram Program: A Look at Portability, Efficiency and Ease of Use*, MS project by Mike Baker, 2010. (Supervised jointly with Dr. Bill Knowlton from MSE Department)
- *A Parallel Computing Test Bed for Performing an Unsupervised Fluoroscopic Analysis of Knee Joint Kinematics*, MS thesis by Renu Ramanatha, 2009 (Supervised jointly with Dr. Elisa Barney Smith, from ECE Department)
- *Data Clustering Using MapReduce*, MS project (Makho Ngazimbi, 2009)
- *PTK: A Parallel Toolkit Library*, MS thesis by Kirsten Allison, 2007.

SELECTED PUBLICATIONS

- 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.
- *Modeling Realistic Two and Three-Dimensional Microstructures: The Effects of Microstructural Anisotropy on Percolative Processes* by M. Frary, L. Hindman, D. Shrader, A. Jain, presented at MS&T 2007, Detroit, MI, September 2007.
- *Using Absent Sequences to Study and Predict Evolution* by Greg Hampikian, Tim Andersen and Amit Jain, Pacific Symposium on Biocomputing, Seattle, 2006.

- Parallel Pencil-Beam Redefinition Algorithm by Paul Alderson, Mark Wright, Amit Jain, and Robert Boyd. Appeared in pp. 537-544 of *Recent Advances in Parallel Virtual Machine and Message Passing Interface*, LNCS2840, Springer-Verlag, 2003. (Paul Alderson and Mark Wright were both CS undergraduate students).

SYNERGISTIC ACTIVITIES

- As Co-PI and 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. The Boise State Cluster has been in production use since May of 2004.
- Part-time Chief Scientist for Baliwoo, Inc, a software company based in Boise. Research in large scale data mining.
- Member of Software Alliance group, Idaho Technology Council, 2008 onwards.
- On the organizing committee for annual Boise Code Camp conference with about 400 attendees.
- Helped organize CS module for E-girls workshop for 9th-10th grade girls, 2008-2012.
- High School Programming Competition, 2007-2009.
- Coordinator for *Introduction to Computer Science I* course.
- Liaison for High School Concurrent Enrollment.

SELECTED FUNDING SUPPORT

- 2006-2011: *Idaho Engineering Scholarship Program*. Funded by National Science Foundation Co-PI. Amount \$499,890.
- 2007-2010: *HERC Center for Musculoskeletal Research*. Funded by State of Idaho. Co-PI. Amount \$1,022,700.
- 2008-2009: *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.
- 2004-2008. *Scholarships for Computer Science and Engineering Education in Idaho*. Funded by National Science Foundation. Co-PI. Amount \$400,000.
- 2006-2008: *Development of Microstructural Models for Intergranular Fracture in Three-Dimensional Polycrystals*. Funded by NASA Idaho Space Grants Consortium. PI: Megan Frary (Material Science and Engineering), Co-PI: Amit Jain. Amount: \$60,000.
- 2003-2006: *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.

APPENDIX C: OTHER (LETTERS OF SUPPORT)

Attached letters:

1. *Jay Larsen*, President, Idaho Technology Council.
2. *Brad Wiskerchen*, CEO, Keynetics, Inc.
3. *Robert Lokken*, CEO, Whitecloud Analytics
4. *Dave Boren*, CEO, Clearwater Analytics.
5. *Von Hansen*, Vice President and General Manager, Future Technologies, Hewlett-Packard.
6. *Pete Gombert*, CEO, Baliwoo.
7. *Ryan Woodings*, Chief Geek, MetaGeek, LLC.
8. *Todd Weible*, CIO and Owner, PinnPointe Consulting and Impact Sales Inc.
9. *Matt Cooley*, Vice President of Information Systems, Scentsy.



Idaho Technology Council

March 20, 2012

Dear HERC Committee Members:

The software industry in Idaho is the fastest growing industry segment with tremendous demand for talented, well-trained, innovative software developers. The Boise Metro area is home to hundreds of software companies that urgently need new talent to expand their business. Boise State's proposal will help alleviate this pressing need for software professionals through implementing strategies to attract, retain and graduate computer science students.

The Idaho Technology Council (ITC) supports Boise State University's proposal to use IGEM funding to expand and restructure its Department of Computer Science. This proposal will take strategic action to meet the needs of Idaho's technology sector and lay a foundation for increased economic growth. One of the greatest challenges to business growth in Idaho's tech sector is the shortage of software talent. The Idaho Department of Labor noted that close to a thousand software jobs have been posted in the last few months and this demand for talent will continue as Idaho businesses grow.

The ITC recently distributed a survey that asked tech companies to estimate job projections for software positions, which revealed that software companies employed an average of twenty software professionals and anticipated doubling their software workforce in the next five years. The number of average computer science graduates from Idaho universities each year is around 20 students—not enough to meet current, let alone future demand for software professionals.

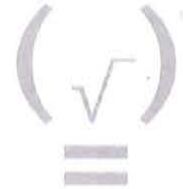
The IGEM Program was conceptualized to help Idaho be strategic in its funding of higher education. The proposal from Boise State University will strategically support Idaho's technology ecosystem through directly addressing the need for a high quality workforce.

Thank you for your consideration and for your commitment to growing a stronger software workforce.

Sincerely,

A handwritten signature in black ink that reads 'Jay Larsen'.

Jay Larsen
President, Idaho Technology Council



March 20, 2012

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

keynetics

10200 E. 15th St.
Suite 100
Boise, ID 83720

208.333.4444

keynetics.com

Re: Letter in Support of the IGEM Proposal

Distinguished Members of the HERC:

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

Keynetics has two operating subsidiaries, ClickBank and Kount. ClickBank is one of the Internet's largest digital goods retailers. We sell over 35,000 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.

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 small number of annual graduates from the Boise State University computer science program. As such, Keynetics has been forced to open a facility near the University of Colorado where we have hired approximately 30 information technology professionals.

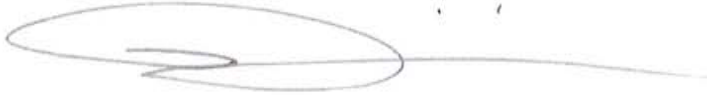
Notwithstanding the foregoing, Keynetics has hired several Boise State computer science graduates over the last several years. These individuals have been, without exception, outstanding contributors to our team. Based on that experience, Keynetics has confidence that if Boise State is provided the resources set forth in the IGEM proposal, the Boise State University computer science department can deliver more well-trained, high-quality technologists to the Idaho business community. These graduates will help expand Idaho's technology infrastructure, they will advance the local economy (as they are generally highly paid individuals), and they will sharpen Idaho's competitive edge.

In short, expansion of Boise State University's computer science department is vital to the growth of Idaho's economy (for example, I would prefer NOT to have to continue to expand operations in other states). And providing Boise State University with resources like those set forth in the IGEM proposal is a condition precedent to the expansion of that computer science department.

Please help Keynetics, and other Idaho technology companies, expand and excel in the Gem State.

Thank you for your time and consideration.

Sincerely,

A handwritten signature in black ink, consisting of a large, stylized loop followed by a horizontal line extending to the right.

Bradley J. Wiskirchen
CEO, Keynetics Inc.

March 20, 2012

Higher Education Research Council
Idaho State Board of Education

Dear Members of the Council,

Clearwater Analytics strongly supports the Boise State University proposal to use \$667,000 of the IGEN funding to expand the Computer Science Department. We have a very good opinion of the BSU Computer Science Department and our only complaint is that the program is too small. The role of technology in the economy has increased dramatically in the past 10 years, but the size of the CS department has not kept pace with the increasing demand for graduates with CS degrees.

Over the past few years Clearwater has expanded its development team to nearly 60 developers and we plan to hire 30 more during 2012. We actively recruit at BSU and are very happy with graduates of the program. The only problem is that there are not enough relative to the number of employers who would like to hire them. Twenty two members of our current development team have CS degrees from BSU and two more will start full time after they graduate this spring. To try to meet our hiring needs, we also recruit at eleven other universities and have nine graduates from those schools starting with Clearwater this spring and summer. We also plan to have 15-20 interns in the development department this summer, several of whom are currently BSU students.

If BSU is able to expand the CS department and increase the number of graduates, we would love to hire more of them. Software development is one of the key drivers of our business growth and as we are able to expand the development team we also grow the business and hire graduates in other majors as well (Accounting, Finance, Marketing, Business, English, Math, etc). If it takes a long time to build the department, we will need to look at other options to meet our hiring needs. We are in the process of building out a second co-location facility in Seattle this month (the first is in Boise) and considering building a remote development office as well. We have also considered remote development offices in Portland and Denver. We prefer to expand in Boise, but the ability to hire software developers is the limiting factor.

The BSU CS department is doing a great job building a quality program and we are excited about this opportunity to expand it more quickly. We would like to continue to support the program in a variety of ways including internships, scholarships, presentations, or other ways that might be appropriate. The IGEN funding is a great opportunity for the BSU computer Science Department, but also a great opportunity to make a meaningful contribution to economic growth in Idaho. There are high paying jobs available for the additional CS graduates and those jobs will lead to business growth in the technology sector and to the creation of other jobs as those companies grow and prosper.

Sincerely,



Dave Bofen

CEO, Clearwater Analytics

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Hewlett-Packard Company
11311 Chinden Blvd.
Boise, ID 83714
www.hp.com

March 16, 2012

To the Higher Education Research Council Idaho State Board of Education:

I recently had the opportunity to review the IGEM proposal for increasing the funding for the Boise State University Computer Science department. I agree with the IGEM assessment that the demand for computer science graduates is growing and the number of jobs in the Treasure Valley greatly outweighs the number of graduates. Software development is a key focus and growth area for Hewlett Packard at the Boise site. Although we've been able to hire some computer science graduates from BSU, the majority of our hires come from outside of Idaho, because of the lack of local availability. I have met with several other growing software companies in Boise and they share the same frustration and find it even more difficult to attract top computer science talent to fill their positions in Idaho. As a result, companies shift computer science jobs to other states. In addition, technology companies seeking to relocate or start businesses in Idaho are discouraged to do so because of the lack of computer science and software engineers. My deep concern is that without proper funding for additional faculty and research projects, Idaho will continue to lose job opportunities to other states, and technology growth in Idaho will suffer.

I believe with properly funded growth, the Computer Science program at BSU will have the ability and capacity to attract and retain top high school talent, and graduate a higher number of qualified computer scientists. This will help enable HP and other companies to expand, bringing higher paying jobs and economic growth to Idaho. I look forward to this proposal being approved by the board as the first of many steps in making Boise State University a leader in Computer Science and a foundation for the technology companies of Idaho.

Thank you,

A handwritten signature in black ink that reads 'Von E. Hansen'.

Von Hansen
Vice President & General Manager
Future Technologies
Hewlett Packard

Pete Gombert
Balihoo
404 South 8th Street – Suite 300
Boise, Idaho 83702
March 19, 2012

To whom it may concern:

I am writing this letter in order to voice my support for the allocation of funds from IGEM to the Computer Science program at Boise State University.

The CS program has been a strong partner to Balihoo for 7 years now and I have deep respect for the program and the quality of the engineers that it produces. In fact our CTO, Paul Price is a BSU graduate and was introduced to me by Professor Amit Jain. Paul is one of the most talented engineers I have ever had the privilege of working with over my 20 year career. However, the simple fact is that the CS program is unable to deliver the sheer number of engineers that the Boise Valley requires on an annual basis.

Balihoo cannot recruit enough talented software engineers in the valley and as such we are forced to recruit from out of state. This is not only costly in terms of dollars, but more importantly it costs time which is infinitely more valuable to us. As a result we have an ongoing discussion internally about the viability of keeping Balihoo headquartered in Boise. If we cannot recruit and retain the talent we need, we must go elsewhere in order to remain viable. We are managing to get by today, but if our growth continues we will most certainly struggle.

Balihoo has grown from 20 employees in 2009 to 70 employees today with 10 engineers. So for every 1 engineer we are creating 6 additional jobs and this ratio should hold true or even expand as we grow. On top of that our average salary is just under \$70,000 per year, so these are very good jobs.

I love Boise and hate the thought of having to leave town, however, I have a fiduciary responsibility to the shareholders of this company to do the right thing. Software engineers are the lifeblood of our company and we simply cannot risk having that lifeblood impeded in any way. Any investment into the CS program at Boise State would help to alleviate the current situation. The IGEM investment will not solve the problem, but will be a strong indication that the State values Computer Science and the companies that rely on CS graduates.

Sincerely,



Peter M Gombert
CEO
Balihoo

Re: Letter of Endorsement for BSU CS Dept
March 19, 2012

In 2005 I developed Wi-Spy, a small USB-based spectrum analyzer. Although it was atrociously inaccurate and limited compared to traditional spectrum analyzers, it was the first spectrum analyzer that plugged into a laptop via USB and at \$99 it was finally affordable for casual use (other spectrum analyzers cost thousands of dollars). The key to the success of Wi-Spy was the ability to turn cheap, off-the-shelf hardware into a basic spectrum analyzer by moving all of the smarts into software running on a laptop. This provided flexibility in features, and also meant that MetaGeek's future was in the hands of the engineers creating the software.

Wi-Spy quickly outgrew my ability to be the solo developer (along with marketing, tech support, and sales). In December 2006, I recruited Brian Tuttle, a former co-worker and BSU CS graduate. Brian and I rented a small office at the BSU TECenter in Nampa. Shortly thereafter Brian introduced me to Dr. Amit Jain, his Computer Science advisor at BSU.

As MetaGeek has grown over the past six years we've interviewed dozens of software engineers with varied backgrounds and educations. We are highly selective in the interview process, looking for engineers that have a solid foundation of software engineering principles, the desire to always be learning and expanding their skills, and the ability to work in a highly collaborative team environment. Graduates from Boise State's CS program have consistently performed well in our interviews and the overwhelming majority of our software engineers are from BSU. Starting in 2009 we've had at least one CS intern from BSU working part-time at MetaGeek and we currently have three part-time interns.

The success of MetaGeek is in large part thanks to our numerous employees who are graduates or current students of the Boise State Computer Science department. We also recognize that our future success is also linked to the continued growth and consistent quality of BSU CS department. Since 2010 MetaGeek has contributed approximately 5% of our net income to fund the Computer Science Student Lab, and we work closely with the faculty to create semester projects, present symposiums, and provide paid internships to provide real-world experience for students.

Support from IGEM to the Boise State Computer Science Dept will help companies like MetaGeek continue to create high-paying jobs to build the economy of the Treasure Valley. Please provide support to increase the quality and breadth of this already exceptional department.

Sincerely,



Ryan Woodings
Chief Geek
MetaGeek, LLC



Impact Sales, Inc.

Todd Weible
PinnPointe Consulting & Impact Sales, Inc.
915 W Jefferson St.
Boise, ID 83702
March 19, 2012

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 encourage the Higher Education Research Council to adopt and include Boise State University's proposal as part of the critical mission the Idaho Global Entrepreneurial Mission (IGEM) is fulfilling in the State of Idaho. 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 quality of the professors and graduates of the Computer Science department is exceptional; what our companies need is more bandwidth at the professorial and research levels and higher throughput of graduates. In the past, PinnPointe attempted to collaborate with Boise State on a research project designed to be innovative within our industry, but the limited bandwidth of available professorial oversight and resources did not allow us to proceed. Our company is now pursuing a subsequent project that could be an excellent collaborative venture with the department, but again, the University's resources to effectively partner on opportunities like ours are too limited and thus quickly over-committed. The proposal before you will make great strides in addressing the needs of not just the software development industry in the State of Idaho, but also many other industries like ours, who rely on Computer Science graduates to help us innovate within our sector.



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. Just as the legislature and Governor Otter intended when they authorized the creation and funding of IGEM, this proposal will succeed in building and growing the collaboration between our industries and our higher education system. This investment 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 horizontal line.

Todd Weible
CIO
tweible@pinpointe.com



March 19, 2012

Dear Members of the Higher Education Research Council, Idaho State Board of Education,

I am writing to lend support to the IGEM legislation and the tremendous value it can provide to the Boise State Computer Science program. Please allow me an opportunity to provide some additional context as to why I feel this funding can help not only Boise State and the Computer Science program, but also our community as well.

Scentsy is a fast paced, growing company, employing over 1,000 individuals in our corporate facilities and supporting over 175,000 Independent Scentsy Consultants in five countries. Our Consultants produce a lot of web traffic and a lot of data – and we require a lot of technical expertise and software to support their demands.

We are proud to have our headquarters in the Treasure Valley, and attracting and retaining local talent is crucial to our expanding business. We currently employ over 75 people in the software development and maintenance process, with many positions still open to meet the demands of the business. Paramount to our expansion is finding and hiring people with the right skill sets and the right team fit. Over 85% of our current staffing has been from talent found here in the Treasure Valley. That's a trend we hope to continue! Lower hiring costs, quicker hiring times, and more families earning (and spending) money right here in our area is a win for all of us. As a community, we absolutely have to maintain our ability to produce and build the talent of tomorrow. That process starts in the funding and continuing education provided by computer science programs like Boise State's.

As a Boise State Computer Science graduate, I have witnessed first-hand the expansion and evolutionary improvements made to the Computer Science program over the last decade. I have been impressed with the caliber of professors the program has attracted, the advanced facilities for students to learn and experiment in, and the expansion of the curriculum and depth of topics offered. Boise State has provided a program for the talent of tomorrow – but that program requires continued support and funding to keep it healthy, competitive, and vibrant.

Thank you for your work and consideration on this matter,

A handwritten signature in blue ink, appearing to read "Matt Cooley".

Matt Cooley
Vice President of Information Systems
Scentsy, Inc.