DSU – Resources

Karl Mundt Library Support:

The Karl Mundt Library has a long tradition of providing academic support to its faculty, staff, and students. We provide in-person and online information literacy instruction across the curriculum, and continually update our library's website and Libguides to reflect the changing needs of students and faculty. In addition, our reference librarians are available for personalized assistance via chat, email, zoom, or in person. Our interlibrary loan department provides speedy and seamless borrowing and lending across the nation and around the world. Two years ago, the Mundt Library launched the Dakota State University institutional repository, Beadle Scholar, which features dissertations, theses, and scholarly work in various formats from across the campus.

Because DSU has historically served a large number of online students, the great majority of our resources are available electronically. Our catalog includes access to our physical collections but also guides researchers to the large number of electronic books that are ready for use.

For any program in the area of computer science, we feature the following databases, which are available to students and faculty on-campus or off-campus:

ACM Digital Library - The ACM (Association of Computing Machinery) provides full-text articles in this database about computing. It includes: ACM journals and magazines, ACM proceedings by subject, ACM proceedings by sponsor, ACM proceedings by series, journals and magazines by affiliated publishers, and resources from affiliated organizations.

IEEE Xplore Digital Library – IEEE Xplore is a research database for discovery and access to journal articles, conference proceedings, technical standards, and related materials on computer science, electrical engineering and electronics, and allied fields.

IGI-Global Gateway - Provides over 3,000 reference books and 155+ peer-reviewed journals focusing on information science and technology trends.

InfoSecurityNetBase - Provides full-text books online about information security.

O'Reilly for Higher Education - The O'Reilly for Higher Education digital platform includes more than 38,000 book titles and more than 30,000 hours of video. Topics range from programming to IT networking to project management to graphic design to business strategy. The content includes code snippets, certification preparation materials, practice exercises, training videos, and much more.

ScienceDirect - The Library has added over 100 e-books from two collections. Also, the Library subscribes to 10-15 Elsevier journals, including: Decision Support Systems, Journal of Computer and System Sciences, Journal of Systems and Software, Computers and Security, International Journal of Medical Informatics, Artificial Intelligence in Medicine, and Journal of Biomedical Informatics, etc.

Web of Science – Provides comprehensive citation data for many different disciplines including computer science.

LinkedIn Learning - LinkedIn Learning provides high quality software training videos

Madison Cyber Labs

MadLabs drives innovation and ideas from DSU into the South Dakota economy, the Great Plains, and the nation. At the same time, it draws new talent to the state and the region. The facility and its programs attract elite scholars, researchers, professionals, and partnerships with government, business, nonprofits, and other higher education institutions.

This $18-million, 40,000-square-foot building just finished construction on the southwestern edge of campus. It is the first research facility of its kind in the Upper Great Plains region.

There are five components to MadLabs' game-changing plan to reshape the cyber field in South Dakota.

Resources: A winning combination of laboratory research space, state-of-the-art hardware and software, faculty expertise, and growing institutional relationships with a wide variety of public and private agencies

People: Undergraduate and graduate students, faculty, researchers, interns, and other collaborators

Programs: Nationally recognized cyber degrees from the associate to doctoral level, along with other professional development opportunities

Research areas and institutes: Focus areas in defined interdisciplinary and multidisciplinary regions, that draw from every college on campus

REED Connection: DSU is connected to the South Dakota Research, Education and Economic Development Network (REED) via 100 Gbps connection. Providing the campus with connectivity to Internet2, the Great Plains Network, and other research networks.

DAKOTA STATE UNIVERSITY

RE: Support for Computer Science Ph.D. Program

April 17, 2020

Review Team,

On behalf of Research and Economic Development Affairs at Dakota State University (DSU), please accept this letter of support for the Computer Science Ph.D. program under consideration at DSU. As an institution, we have made a strategic decision to increase the depth and breadth of highly technical research endeavors to spur research output by our students and faculty, increase economic development for our state and region, and further improve our already stellar academic programs. This Ph.D. program will be an integral part of DSU's current efforts in computer science, cybersecurity, artificial intelligence, and prepare us for areas of research and study that develop in the future.

DSU is especially excited about this program given the on-campus presence of doctoral students and faculty that will foster an environment of deep study and technical research. DSU recently opened a new 40,000 square-foot research building, known as the MadLabs, that houses nearly 20 research clusters that would all benefit from Computer Science Ph.D. students and faculty on campus.

As a former faculty member in the Beacom College, I know firsthand how foundational computer science is to what DSU has become and aspires to be. In order to reach the goal set by the Governor, SD State Legislature, and SD Board of Regents to increase research-based economic development, a doctoral program in Computer Science is simply a must-have. Further, a Ph.D. program in this critical area will further strengthen DSU's regional and national reputation as a leader in Computer & Cyber Sciences.

Respectfully submitted,

Josh Pauli, Ph.D.
VP Research

DAKOTA STATE UNIVERSITY
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MadLabs Research WebSite

DSU's information Assurance Lab Virtualization Support.

The resources created are utilized by all Beacom undergraduate and graduate programs and research. Students and Faculty in the CSC Ph.D. program will have full access to these resources beyond their original purposes.

DSU's information Assurance Lab is our custom designed solution to the problems of technology education. Our lab was designed and implemented in 2009 and its use has continually grown ever since with the additions of new classes plus growing enrollment.
The IA Lab allows for an instructor to focus their time on creating and testing their lab. Once their lab is created, it can be cloned for testing in a matter of minutes. Once the lab is finalized, the lab administrator can copy unique instances of the lab to all students within the class. This process takes approximately 20 minutes total, depending on the size of the class.
The lab has the ability to run any platform (Windows, MacOS, FreeBSD, or Linux), in addition to popular firewall and router platforms as well as GSM cellular base stations. These labs are all safely contained so that students are safe when practicing any cybersecurity concepts.

Eric Holm: System Adm: Eric Holm graduated from DSU with a Bachelor of Network and System Administration and Master of Information Assurance and Network Security. He currently is the System Administrator for the IA Lab at Dakota State University. As the sysAdmin for the IA Lab, it is his role is to support the Faculty and Students needs for a highly flexible computing environment. This includes training faculty on how to use the environment, learning the specific requirements that their lab may require, and finding the best way to implement that in a hands-on manner. He also works with individual students and student organizations that leverage the IA Lab for extracurricular learning. That may include a student just wanting an isolated environment to work with malware to a group of students building and hosting cybersecurity competitions.

Users

Due to the self service nature of our lab implementation, it can be used for projects far beyond the classroom. The IA Lab hosts research projects for undergraduate and graduate students, in addition to housing research projects for faculty members. Due to the safe/secure nature of the lab, it also houses DSU's High Performance Computing/Hadoop environment.
The labs users vary from semester to semester, but largely include students from the following programs:

Information Systems
Cyber Operations
Computer Science
Network Security Administration
Computer Game Design
Digital Arts and Design
Mathematics for Information Systems
Computer Education

DSc Cyber Security
DSC Information Systems
MS Analytics
MS Applied Computer Science
MS Information Assurance
MS Information Systems
MSE Educational Technology

Technology

In order to facilitate the large lab environment, enterprise grade hardware is required. This is the type of hardware that would be found in any large scale corporate IT environment and includes:

- Virtualization software that's both custom-created for our unique needs coupled with software from VMWare
- Wireless/Cellular/Mobile modules to create GSM base statations
- Enterprise-Grade servers
    - Large memory capacity per server, in excess of 128 GB
    - High network throughput, in excess of 4X gigabit interfaces
    - Storage Area Network connectivity, dual 8GB fibre channel
- Large-scale networking equipment (from Juniper Networks)
- Fibre Channel Networking equipment providing dual connections to every server (From Cisco)
- Large storage capacity for storing student/staff labs and research from HP/3PAR

Accomplishments

Our lab design is very unique to our own needs. We use a great deal of software and hardware and run it to its limits to accomplish what we do, but we have achieved many accomplishments

- Several entities have modeled their own labs based off of our own design
    - National Security Agency
    - Naval Post Graduate School
    - Northeastern University
    - University of Cincinnati
- We've worked closely with VMware to improve their own software, discovered and reported bugs, and helped shape the direction of some of their products
- Our online programs have a significant competitive advantage over the online programs of other universities across the nation
- Our Center of Academic Excellence in Cyber Operations hinged significantly on our ability to focus on hands-on education of our graduates