SAGINAW VALLEY STATE UNIVERSITY

Master of Science in Computer Science and Information Systems

Program Proposal

Department of Computer Science and Information Systems
10/18/2016

Contents

Master of Science in Computer Science and Information Systems (MS-CSIS)

1. INTRODUCTION

Mission

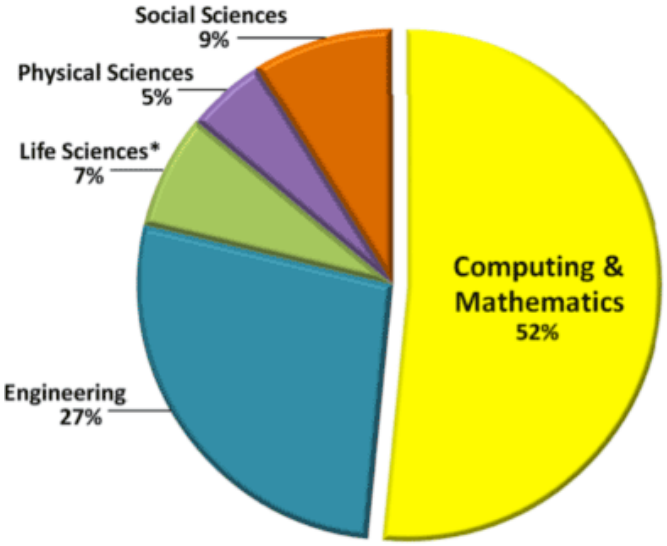
To expand academic and career capabilities by presenting advanced computing topics in a hands-on learning environment, advancing education and enriching local and international communities.

Vision

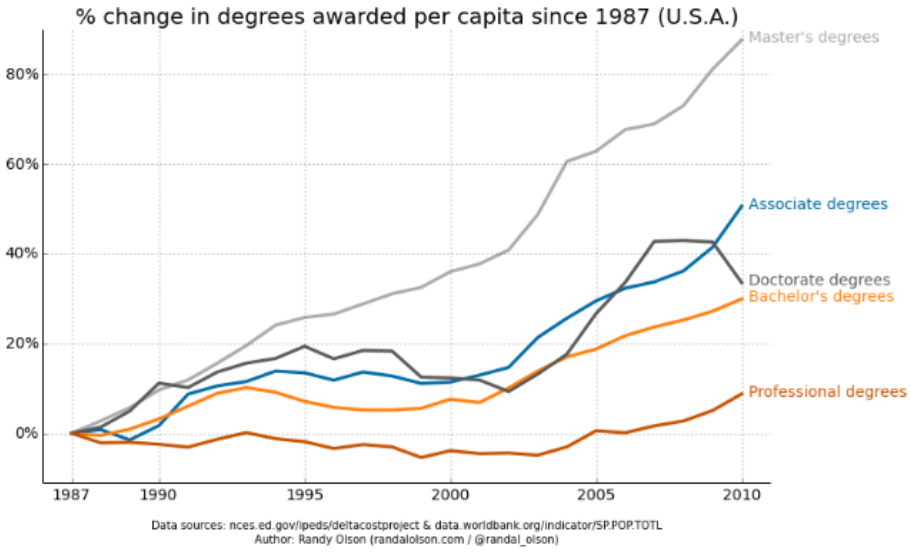
To be recognized for a personalized teaching style, an emphasis on practical application of course content, and an inclusive blend of local and international students and educators.

Viability

According to the Bureau of Labor Statistics (BLS), 52% of all growth in STEM jobs 2010-2020 will come from the Computing and Mathematics category. This demand is expected to drive broad growth in computer related education.



Master's degrees have long been the fastest growing educational credential. Computer science represents 2.8% of all master's degrees, which is the 8th most popular master's level degree according to the US Department of Education. This percentage will continue to rise with the growth of undergraduate degrees in computer disciplines. At Stanford and Princeton University, for example, computer science has become the most popular undergraduate major.



In the 2015-2016 academic year, SVSU's CSIS department graduated a total of 43 students with bachelor's degrees in computer science (CS) and computer information systems (CIS), 38 of whom were domestic students. Overall, CSIS undergraduate student enrollment has been growing steadily since the department's inception. The

combined majors of Computer Science and Computer Information Systems saw the number of enrolled students exceeded 300 in the recent semesters of Fall 2015 and Winter 2016. This makes CSIS one of the largest departments (in terms of major students) under the College of Science, Engineering and Technology (SE&T).

Figure (a) and **Figure (b)** below show the number of enrolled CS and CIS majors (combined) during Fall 2006 – Fall 2015 and Winter 2006 – Winter 2016 semesters respectively.

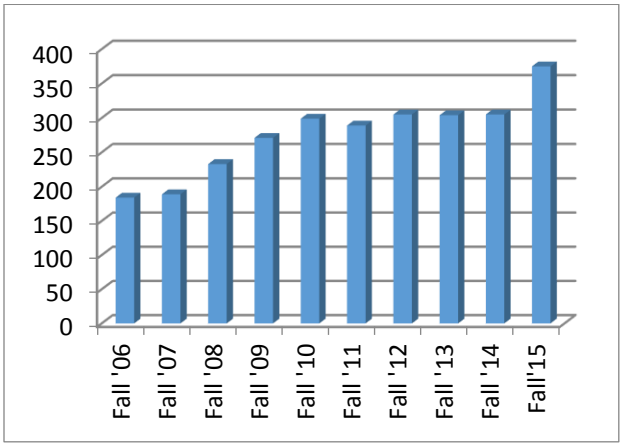


Figure (a)

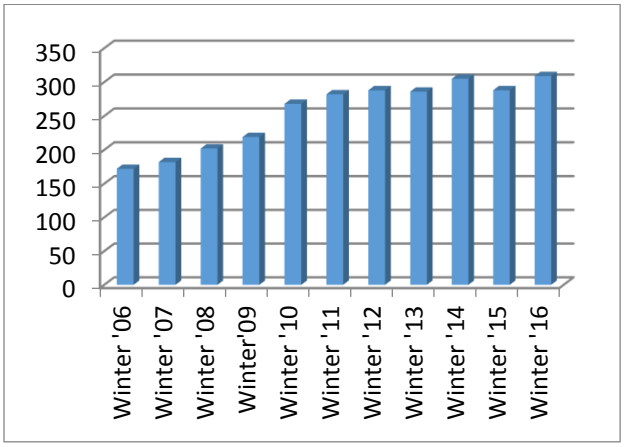
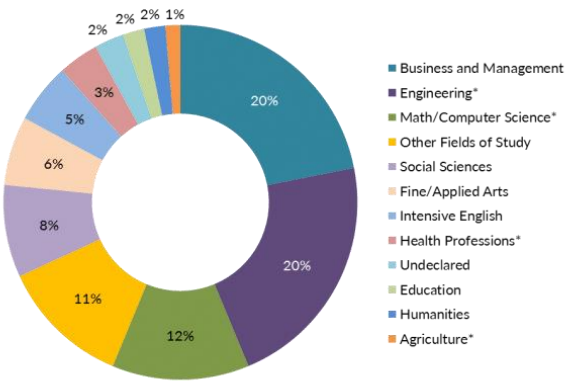


Figure (b)

SVSU's own CIS undergrads have few local options in pursuing postgraduate technical degrees. Many opt to pursue an MBA or have enrolled in various master's programs at SVSU or CMU simply because they do not prefer to leave the region. The proposed degree would be attractive to both CS and CIS graduates because it offers the unique combination of a contemporary program design (Computer Science and Information Systems, not just Computer Science), plus the same hands on approach that is used in the existing SVSU CSIS undergrad programs. It is also known that computing is one of the most pursued majors at many schools worldwide. As such, international students are trying to find programs in the US. If SVSU sets up strategic partnerships with foreign schools, a feeder system could be created to attract international students to the proposed program. The combination of SVSU's own graduates and international students should keep the proposed program viable if it is marketed properly and students are actively sought out.



According to the US Census Bureau, roughly 25% of all bachelor's degree holders eventually earn master's degrees. If 25% of SVSU's local CS/CIS students pursued master's degrees at SVSU, that would amount to roughly 10 local students per year. If international students are added to that count, the proposed program would likely hit its maximum capacity, filling all courses each academic year.

According to the National Foundation for American Policy, international students comprise 63.2% of all graduate students in computer science. Some programs have international enrollments exceeding 90%. Dr. Robert Adams of GVSU indicated that roughly 25% of GVSU's 30 MS-CIS students are international – up from 0% five years ago. The UM-Flint website reports that it graduates over 50 MS-CAIS students annually and it is estimated that of these 80-90% are international students. Jenna Briggs (Director, Graduate and International Admissions at SVSU) stated that if SVSU were to offer a master's program in a CS-related field there would be more international applicants from countries such as India, China, Bangladesh, Nepal, and countries from middle-east than could be admitted by SVSU due to classroom capacity and other constraints. According to the Institute of International Education (IIE) Open Doors Report from the past two academic years (13/14 and 14/15), the number of students entering the US to pursue CS and CIS degrees has risen exponentially. The academic year 12/13 to 13/14 increase was 21% (53,953 to 65,291) and 13/14 to 14/15 saw a 27% rise (65,291 to 83,241). This makes for a 54% increase over the past two admissions cycles. Source links: [1], [2].

In conclusion, there appears to be a very satisfactory market available for master's level computing education. While the local student population alone may be insufficient to support a new degree program, the local market coupled with the international market appears to provide a very sufficient base number of students to make this proposed program financially feasible. We are hopeful to attract around 15 students in our first year of journey and we expect the number would grow gradually up to the limit of 30 for each class within a couple of year. Moreover, offering a Master's level education in general, and computing education in particular, represent attractive growth areas for SVSU.

Michigan institutions, computer-related master's degrees

Institution	MS-CS	MS-Sec	MS-SE	MS-IS	Credit hours
CMU	MS-CS				30
Davenport		MS-IA			34
EMU	MS-CS				33
Ferris		MS-Sec			33
GVSU				MS-CIS	33
Kettering	MS-CS				40
LTU	MS-CS				30
MSU	MS-CS				30
MTU	MS-CS				30
OU	MS-CS	MS-Cyb	MS-SE		32
SVSU	MS-CSIS			MS-CSIS	**30**
UD-Mercy		MS-Cyb		MS-CIS	30
UM-AnnAr	MS-CSE				30
UM-Drbn			MS-SE	MS-CAIS	30
UM-Flint				MS-CAIS	30
WMU	MS-CS				30
WSU	MS-CS				33

Program distinctiveness

SVSU's MS-CSIS would differ from other degree options because it would present advanced topics in an applied, hands-on educational environment. It would include traditional computer science topics but also provide a special emphasis on information systems. This approach – more business, less science, more practical, less theoretical – represents the preferred learning style among the local population and fits in well with SVSU's vision: to be recognized for experiential learning.

The inclusion of information systems as a core component of the curriculum is a progressive advancement and distinguishes SVSU from its competitors. Consider other computer science-related master's programs in Michigan. Ten of the older institutions, offer traditional MS-CS programs. Four offer security (MS-Sec) specializations. Two offer software engineering (MS-SE) degrees. Five offer information systems, but no institution balances both computer science and information systems in the same fashion as the SVSU MS-CSIS proposal.

Students who are looking for a traditional Computer Science master's will find that experience available to them in the proposed program. Highly technical courses in cutting edge areas will be available with the opportunity for a student to complete a research based thesis. The proposed program offers an excellent research based degree that could be used as a stepping stone to those students who want to continue on and pursue a doctoral program.

For Computer Science students who would like a more practical and application-oriented flavor in a master's program, this proposal also serves those students. Students will have the ability to blend pure theoretic computer science courses and applied information systems related coursework culminating in a more applied degree. These students may choose to forego a thesis and instead complete the degree through additional coursework.

This program will also provide SVSU's own CIS undergrad students with the ability to earn a postgraduate computing degree that is technical in nature. Currently many CIS students pursue MBA programs because they are unable to meet the entrance requirements of the pure computer science master's programs. The proposed program will also attract graduates from other institutions who find themselves encountering the same entrance challenges. This proposal embraces all computing undergraduate degrees and will provide the opportunity for those students to complete a technical master's program.

Furthermore, employees whose workplace roles are technical computing in nature may also enroll in this program by completing a "Fast Track" set of remedial courses. Examples of these roles may be business program graduates who are performing IT (information technology) work, health informatics personnel and even engineers who serve in IT related capacities. This provides an opportunity that would add distinctiveness to SVSU, further adding to the base of potential students attracted by this proposed program.

Price, location and convenience represent additional advantages. SVSU's MS-CSIS degree would be offered at a competitive price compared with other Michigan colleges. Location is expected to be an important factor for local students particularly if they are working full time at companies in the Saginaw-Bay City-Midland area since no other program like this exists regionally. Another competitive advantage would include offering some courses in an online format. SVSU's Canvas learning management system facilitates this delivery method which can be very helpful and attractive for busy professionals. The proposed courses will be offered during evenings and online/hybrid to make learning more convenient for working students.

In considering the various aspects mentioned above, all of these factors converge to make the MS-CSIS proposed program a uniquely distinctive education offering. A mix of course delivery styles, coupled with a balance between hands-on theory and application in timely topics, accessible to the

broadest range of students possible offered at a competitive price make this a highly attractive program that will help further and enhance both the CSIS department and SVSU's mission and vision.

Serving the local community

The program will be producing employees that have advanced skillsets. This translates into an opportunity for regional companies being able to pursue projects locally due to the talent in the graduates that the program is producing. Additionally, SVSU will be recognized as the entity responsible for creating these skilled folks for the local companies. With the number of MS CSIS students who would reside on campus, especially international students, SVSU could consider creating a software development think tank where students could work with not-for-profit companies and those companies who lack the necessary resources to pursue development projects on their own. This would enhance the reputation of the University through its community outreach while enabling organizations to achieve goals they might not be able to reach on their own.

Who will hire graduates from the proposed program

Domestic students will most likely remain with their current employers if they are currently working in local companies such as Nexteer Automotive, Covenant, Yeo & Yeo, Halla Mechatronics, Dice Corporation, Rehmann, and Morley. Some may look for a new job with a local employer based on their additional education/skillset. Due to the new skills received from their program some students may also decide to pursue other opportunities within the region/state. Companies such as Auto-Owners Insurance, Dynatrace, Ford Motor Company and other organizations will find the knowledge that the students possess to be valuable to their operations on both a regional and multinational level. A few students may decide to pursue a Ph.D. This would be an option some international students would follow while, some will decide to pursue a doctorate; others will look for employment nationwide.

Corporate responses to proposal

The proposal was sent out to 12 different local, regional and international organizations that have hired SVSU undergraduate students soliciting input on the program. The eight companies that responded back represent a diverse stratification including manufacturing, healthcare, computer consulting, higher education, accounting/finance/information technology, software application development and insurance industries.

In general, respondents were very enthusiastic about the proposed program. Almost all commented on the unique mix of technical along with business related courses that are included in the program as being crucial to their organization. Accounting, finance, ethics, and project management were among the non-technical courses that were particularly mentioned. The respondents felt that this is the correct blend and perspective that their organizations need in someone who is pursuing a technical master's degree in computing. The respondents also noted that the timeliness of the technical computing topics was very appropriate and that the skill set this program would provide is on target with their organizational requirements. Other favorable feedback included that the blend of face-to-face and hybrid courses is very useful for employed technical professionals wishing to pursue a graduate program.

After reviewing the feedback from the responses, it appears that the proposed program is found to be valuable to those organizations who have hired SVSU undergraduate students in the past. Many of the organizations indicated that they would consider hiring graduates from this program. In conclusion, the general consensus from the organizations that participated in the proposal review was for SVSU to continue working on bringing this program to fruition. It is perhaps best summarized by this statement from one of the reviewers: "I believe this program has the potential to really change the educational landscape for technology in the Great Lakes Bay Region."

Below are some of the various comments from the feedback that help support the statements made above:

Organization 1:

"I would hire graduates from this program…"

"Great idea for this program. We need more local technical talent. I place a lot of value in SVSU degrees."

Organization 2:

"Great proposal!"

"It appears that you've built a good case for general demand for the course among the US population, and also demonstrated that SVSU's masters program would represent a unique offering among our local competitors."

"It's difficult to get an exhaustive idea of all of the course content, but as an employer my hope would be that students would be challenged by or introduced to some of the very most recent developments and trends in industry. [sic] cloud computing [sic] Virtualized servers and desktops, and issues surrounding mobile computing such as MaaS and MDM."

"I see A LOT of potential business topics in the curriculum, which is great."

Organization 3:

"Curriculum appears well balanced while allowing students to dive deeper into specific areas of interest."

"We sometimes struggle with attracting and retaining entry-level employees. Advanced degrees are certainly important for group leadership and eventual supervisory positions. I have generally found that we have the best record in retaining individuals who have a strong tie to the GLBR [Great Lakes Bay Region] regardless if they have Undergrad or Graduate degrees."

Organization 4:

"Overall, it appears to be a good, comprehensive, valuable program."

"We see the strengths of the program being: experiential learning, the affordable cost, that is caters to professionals with evening and online classes, the topics are of current importance, it provides for the development of local talent, it offers the opportunity to use students for projects,

the flexible admission requirements, and the scholarship offerings. It offers more practical application and less theoretical. It balances [sic] technology with a good spread of disciplines in other concentrations…"

"You have a good mixture of technical and business, something that should apply to the interest of the majority."

"Analytics, Security, Informatics, Mobile computing, Project Management are areas were knowledge is needed. Having education in areas of high need and newer technology will save employers on the job training time. We especially liked seeing the course on Ethics which can be overlooked as being critical to employees and employers."

Organization 5:

"I believe the more business approach and emphasis on information systems from a practical perspective will drive the success of the program. The experiential aspect adds significant value as well. The course offerings are excellent – I believe they are right in line with what's needed in the industry."

Organization 6:

"Provide[s] an opportunity for professionals in our geographical location to continue their education."

"Nice offering of soft or non-IT classes (leadership, ethics, accounting, etc.)"

"I believe the proposed program provides the right balance of technological and non-technological courses to help the BS [bachelor of science] individual be more marketable to their employer."

"Yes…our employees would benefit from this program. Specifically, I would encourage them to look at Software Engineering, Mobile Computing, Software Architecture and Design, management, leadership and finance courses."

"I am hopeful the program will be approved and ready to enroll its first students next Fall. I talked with people in our office and already have people interested to sign up."

Impact to existing CSIS undergraduate program

The proposed MS-CSIS program will open up some exciting possibilities for undergraduates. First of all, SVSU CSIS undergraduates would have the opportunity to work with graduate students on a myriad of advanced projects. Secondly, bringing graduate students into undergraduate classes and allowing them to showcase what the graduate students are doing will help to raise the bar on the two undergraduate programs. Undergraduate education will be enriched by close access to the knowledge and skills the graduate students possess. Furthermore, when the undergraduates realize that this education is available here at SVSU, some will most likely decide that they want to continue on with their education at the graduate level and in the proposed program. The main caveat to the proposal is that additional faculty will have to be hired in order to staff the graduate program. The existing two undergraduate programs are already at full course capacity and the

department simply does not have any faculty to move to the graduate program without impacting the staffing of the undergraduate programs.

Broader issues

Without doubt, a master's program in computer science and information systems will engender benefits extending beyond students and their employers. It will add contributions in three areas: university research, the SVSU campus culture and interdisciplinary collaboration.

The presence of students pursuing advanced degrees will provide faculty with especially capable research assistants which could improve research paper publication quantity and quality, in turn enabling SVSU to bid on larger research grants from a wider range of funding sources. Additionally, working students would be able to bring immediate benefits to their employers by utilizing the skills and technology learned from the proposed program in a daily manner while on the job.

International MS-CSIS students will enrich the campus with greater diversity. Most international students would be full time students, and many would live on campus, continuing to make the campus feel like less of a commuter institution and more of a residential college. As with the undergraduate international students, graduate international students tend to join clubs and become actively involved with campus activities. The interaction between international and non-international students allow for an enriching experience to all as customs, beliefs, language and ideas are exchanged.

There is no domain or major that does not have some application of computer science and information systems applied to it. As an example: the Moshereum, a virtual reality museum tour, has been a collaboration between the Art Department and CSIS undergraduates. Engineering departments and CSIS undergrads have also worked together on various projects where programming and algorithm design were required. Since master's students will be available, this will mean that more collaboration can take place with other SVSU departments. Furthermore as the proposed master's program includes undergrad majors from different backgrounds who enter the proposed program through the "fast track" option, this means that there will be an even richer and more diverse student background that will result in further interdisciplinary collaborations such as with other departments throughout the five colleges at SVSU.

2. PROGRAM PLAN

Program start

Fall 2017

Degree requirements

The program would require 12 credit hours of *core* course work, a minimum 12 credit hours of *elective* course work, and 6 credit hours of *thesis* OR additional course work, for a total of a minimum of 30 credit hours. Transfer students from other graduate schools and SVSU Computer Science or Computer Information System bachelor degree holders (who were allowed to take graduate level courses as electives for their BS degree) would be required to complete as few as 21 credit hours to earn this master degree.

Program administration

The MS-CSIS program would be administered by the Department of Computer Science and Information Systems. A Program Coordinator would be designated to oversee the degree program. The role of the Program Coordinator would be to administer program policies, coordinate with the SVSU Graduate and International Admissions Office for student admission, decide on dismissal for students with unsatisfactory progress from the program, coordinate with other programs/departments regarding handling curriculum changes and reviewing petition approvals.

Program coordinator

The CSIS Department would like to propose that Dr. Khandaker Abir Rahman, Assistant Professor of CSIS, serve in the capacity as Program coordinator. Release time can be offered to compensate the workload responsibilities of Program coordinator.

Other participating academic units and programs

Participating academic units and programs include: Department of Accounting, Law and Finance (ACCT); Master of Science – Health Administration and Leadership (MSHAL); Department of Rhetoric and Professional Writing (RPW); Master of Arts – Communication & Media Administration (CMA); Master of Arts – Instructional Technology and E-Learning (ETD); Master of Arts – Public Administration.

Course delivery

Courses in the proposed program would be delivered in three ways: face-to-face, online and hybrid. The majority of the courses would be face-to-face during evening hours, starting at 5:30pm and 7:00pm. All remaining courses would be offered in an online or hybrid fashion.

As previously stated, offering courses during evening hours or as online/hybrid would open the door for full-time employees whom are seeking advanced degrees. Classrooms and labs that are usually empty during the evenings could be more fully utilized to mitigate the need for new capacity. However, considering the growing number of CSIS undergraduates, it is anticipated that the department would also need additional lab space, computers, and servers to accommodate future graduate students. See the section **"New infrastructure required"** for more details.

Admission requirements

Candidates seeking admission would be expected to hold a bachelor's degree in Computer Science, Computer Engineering, Information Systems, Information Technology or a closely related field with an earned grade point average (GPA) of at least a 3.0 (on a 4.0 scale). Conditional acceptance may be granted to candidates from other areas such as engineering, mathematics, physical science and business disciplines with the condition of having completing the necessary "*fast track"* courses at SVSU. The program coordinator would examine each candidate's background to determine which fast track courses would be required to be completed. Exceptions to this policy would have to be discussed with the program coordinator to determine if conditional admission would be possible.

Disclaimer – Meeting the minimum admission criteria does not guarantee admission to this program. The program coordinator may turn down an application for any valid reason, e.g. the maximum enrollment capacity has been reached for a semester.

GRE requirement

The GRE is not required.

English language skill requirements for international students

A score of 550 or higher on the written TOEFL *OR* a score of 79 or higher on the internet-based TOEFL *OR* an overall score of band 6.5 on the IELTS is required.

Fast track

Candidates without an earned bachelor degree in Computer Science, Computer Engineering, Information Systems, Information Technology or a closely related field will be subject to complete up to five fast track/foundation courses at SVSU. Fast track course(s) will prepare candidates from heterogeneous backgrounds for the MS-CSIS graduate courses.

Fast track courses:

- Computer Programming I or equivalent: CS116
- Computer Programming II or equivalent: CS216
- Computer Networks or equivalent: CS401 or CIS301.
- Statistics or equivalent: CS245
- College Algebra or higher: MATH120A or MATH120B

Fast track candidates must contact with the program coordinator to examine previous coursework and background in order to determine which fast track courses will be required before potential admission to the MS-CSIS program.

Application requirements

- A completed application for graduate admission with application fee
- Official transcripts from all colleges and universities previously attended

- Two letters of recommendation for entry into the graduate program. This requirement is waived for SVSU Computer Science and SVSU Computer Information Systems undergraduates who have earned their bachelor's degree
- A copy of the applicant's resume
- International students must submit a recent TOEFL or IELTS score and evidence of financial support

Financial aid and teaching assistantships

There is no language pertaining to Teaching Assistantships (TA) in the current faculty contract since they have never been used at the University. If teaching assistants are hired, they would not be allowed to teach as they would not be qualified according to the SVSU faculty contract. However, the CSIS department would like to see a provision to offer financial aid to highly qualified students in the form of a TA if it can be included in future contract negotiations.

Scholarships for out of state and international students

SVSU offers a range of scholarships/awards for out of state and international students with strong educational backgrounds. The SV Red & White scholarship is awarded to out of state and international students allowing them to attend SVSU at the in-state residency rate. See [3] for scholarship information.

Transfer students

Select graduate credits earned for coursework from a recognized institution may be able to be transferred to the proposed program. A maximum of nine graduate credit hours would be allowed to be transferred from previous institutions. Transfer students should plan on meeting with the program coordinator to discuss potential credit transfers.

Academic progress

According to the SVSU catalog, the University requires all Graduate Students to have a final 3.00 GPA a requirement to graduate. No credit toward graduation is granted for any course with a grade below a "C". A student may be dismissed from the program if one's cumulative GPA falls below 3.00 after 12 credits have been earned at SVSU. Under certain circumstances, the program coordinator may decide to offer a probationary period to a student before dismissal.

Housing options for graduate students

SVSU does not provide special housing for graduate students. However, graduate students can choose to live in on-campus dorms along with the senior undergraduate students. Family housing is also not available at this point.

Marketing plan

The CSIS department would work closely with the Office of Graduate and International Admissions (OGIA) at SVSU to promote this program locally, nationally and internationally.

Local marketing-

OGIA would directly market to our own undergraduate students that are pursuing degrees in relevant fields. This would be done via career fairs, Facebook advertising, program flyers and email.

National marketing-
OGIA will conduct a digital marketing campaign specifically for the MS-CSIS program. This will be done via an extended network, which allows the geo-targeting of prospects based on zip code, while advertising on national sites (ESPN, FOX, CNN, HGTV, et cetera). SVSU would also attach a re-messaging campaign. Facebook advertising will be used as well, targeting specific groups deemed as potential hot prospects for the program.
Advertising will also be addressed via printed materials and emails on a regional level, such as - Chambers of Commerce, Young Professional Networks, and companies that have operations throughout the state and multinationally.
International marketing-
OGIA will utilize existing relationships with Education USA offices in target countries as the main form of advertising. Not only is this service free, it also allows access to a population whose main intent is to study in the USA. This organization will facilitate webinars that faculty can participate on, virtual college fairs, and direct mailings. In specific countries Education USA will also recruit through education agents for prospect leads as well as with partner schools.

3. COURSE LIST

Core courses– 12 credit hours are required

All MS-CSIS students must complete four of the following courses. If all courses in this category are taken, the fifth would be considered an elective.

All courses are 3 credit hours

- CSIS586 - Cloud and Big Data Analytics
- (Online) CSIS503 - Mobile Computing
- CSIS501 - Computer Networks and Security
- CSIS521 - Software Engineering
- CSIS566 - IT Strategy

Electives – A minimum of 12 credit hours are required

Computer Science Concentration (Required undergraduate prerequisites: MATH161 - Calculus I or higher AND CS316 - Data Structures and Algorithm Analysis or equivalent).

All courses are 3 credit hours

- CSIS621 - Software Architecture and Design Pattern
- CSIS582 - Artificial Intelligence and Expert Systems
- CSIS531 - Computer Architecture
- CSIS576 - Computer Graphics
- CSIS631 - Distributed Systems and High Performance Computing
- CSIS662 - Compiler Design and Implementation

Information Systems Concentration

All courses are 3 credit hours

- (Hybrid) CSIS633 - Information Security and Privacy
- (Online/Hybrid) HS550 - Medical Informatics for Health Management
- CMA550 - Experience Design

Others

At most seven credit hours from the following courses could be counted towards electives

- (Online) ETD515 - Technology Leadership and Management (3 credits)
- (Hybrid) ACCT611 – Financial Accounting Concepts (2 credits)
  AND (Hybrid) ACCT612 – Managerial Accounting (2 credits)
- (Hybrid/Online) LS615 - Ethics in the Professions (3 credits)
- RPW520 - Writing in Scientific & Tech Contexts. Recommended prerequisite: Thesis track student. (3 credits)
- CSIS696 – Internship (3 credits)
- CSIS697 - Special Topics (3 credits)

Note: Students from one concentration may be allowed to take course(s) from another concentration upon advisor's approval and satisfaction of course prerequisite(s).

Thesis or course-only track – 6 credit hours are required

- CSIS671 – Thesis

Thesis track students would be required to complete a total of 6 credit hours of research or project works under an assigned supervisor. The end result would be a written thesis approved by the faculty supervisor.

Students choosing to not pursue a thesis are considered course-only track students. Those students are required to take a minimum of 6 hours of additional elective courses to fulfill the course-only track requirement. Course-only track students should meet with the program coordinator to discuss which elective courses will be taken to fulfill this requirement.

Course statistics

- Number of newly designed graduate courses offered by CSIS: 12
- Number of courses offered by other departments: 8
- Number of fast track courses offered by CSIS: 4-5
- Total courses (excluding fast track) to be offered throughout an academic year: 20

4. DEPARTMENTAL RESOURCES

Current faculty

The Computer Science and Information System (CSIS) Department includes six qualified full-time and one half time faculty: Dr. Scott James (Professor), Mr. Moe Bidgoli (Associate Professor, half-time), Dr. Il-Hyung Cho (Associate Professor), Dr. Khandaker Abir Rahman (Assistant Professor), Dr. George Corser (Assistant Professor), Dr. Poonam Dharam (Assistant Professor) and Mr. Chad Dewey (Lecturer). Adjuncts are hired on-demand to cover several lower-division undergraduate courses. Brief CVs are included at the end of this document.

New faculty required

Among the six full-time (and one half-time) faculty, one faculty member (Mr. Chad Dewey) has one third of his load performing system admin duty, which leads to a total of roughly six full-time faculty in actuality. All faculty are stretched to their limit (two of them are currently overloaded), to handle the increasing enrollment of the CSIS undergraduate programs alone. The department would need two additional full-time faculty starting from Fall 2017 to properly manage both the undergraduate and graduate programs, and to manage the department labs and facilities.

Expertise of new hires: One new hire should have expertise in Big Data, Data Science, Cloud Computing, Distributed and High Performance Computing or closely related areas. The other new hire should have expertise in Information Systems/Technology, Informatics, Management Information System or closely related areas.

Reasons for hiring faculty and their responsibilities:

- ✓ The new hires will take over a significant portion of the newly designed graduate courses.
- ✓ Besides taking charge of the graduate courses, the new hires will take care of any undergraduate courses that are left vacant by current faculty who are teaching some of the graduate courses.
- ✓ The new hires will be engaged in teaching the fast track version of the undergrad courses to be offered during evenings. Indirect benefit: sections for courses CS116, CS216, CS245, CIS301, and CIS386 are often overloaded during regular semesters and at times the department feels the need to open new sections. Offering one evening section for each of these courses would eliminate the overloading problem by allowing regular undergraduate students to register for it, easing the burden of only offering a single section of each course.
- ✓ The CSIS bachelor programs at SVSU has been steadily growing over the past. There continues to be pressure for additional sections of courses to be offered in order to meet the expanding student demand. Critical lower-division courses (e.g., CS116, CS216) must be offered by regular faculty. Adding two new faculty to the workforce would ensure that the CSIS department could increase the quantity of these offerings without sacrificing quality.
- ✓ Current faculty are so tightly scheduled that the department finds it difficult to find substitute professors when a faculty gets awarded release-time for research. This creates obstacles towards performing scholarly activities. Adding new hires would give more flexibility to handle this situation. At the same time, the CSIS department will be ready for

a smooth transition when Professor Bidgoli (who is now in his 3rd year of half teaching load) retires.

- ✓ Highly demanded but never offered courses (due to lack of available faculty), such as "Artificial Intelligence and Expert Systems" and "Computer Graphics", can be offered given additional faculty. These courses will be primarily offered for the graduate program however, high caliber undergrad students will be permitted to take these courses as electives for their bachelor's degree. See the proposed course offering planning below that includes CSIS682 and CSIS676.

New faculty lines confirmed

Dr. Frank Hall (Dean of College of Science, Engineering & Technology) confirmed that the CSIS department will get two new full-time temporary faculty targeting the MS-CSIS program once this graduate proposal passes.

Current infrastructure

The CSIS department is using the classrooms and computer labs located in Science East (SE), Pioneer (P), and Brown (B) buildings. A regular classroom is equipped with a podium PC with multimedia connectivity; touchscreen controlled overhead projector and projection screen; speaker; document projector; audio recording device, whiteboard or (and) chalkboard; and individual chairs for students. Besides the regular classrooms, the following computer labs are being used for several courses:

- SE127: 30 PCs
- SE136: 20 PCs
- SE137: 30 PCs, 1 Dell Switch, 1 Rack System
- SE145: 30 PCs
- SE146: 16 PCs
- P232: 30 PCs
- B213: 30 PCs

The CSIS department has a dedicated research lab located in SE122 equipped with six PCs/laptops; two Apple iMacs; eight Android smart devices; one large TV screen; Xilinx FPGA (Field Programmable Gate Array) boards, photo studio lights; equipment/parts of a robotic hand and a quadcopter.

New infrastructure required

Labs: The CSIS department currently has three dedicated labs: SE146 for capstone projects, SE137 for cybersecurity labs and SE136 for general labs. SE136 is a small room and it can hardly host 20 computers. SE122 was provided to the department to facilitate undergraduate research. However, that room cannot hold more than 5 people. For the graduate program, graduate students temporarily will use room SE-137 during evening hours, when the room is not in use by any class, until some other lab can be identified at some point in the future. In other words, a lab is a necessary resource but no new physical space is needed to proceed with the program.

Computers: The graduate program would require more dedicated servers, and a room is needed to host the server racks. The room should provide enough power and air conditioning to serve in this capacity. Such servers are expensive, somewhere around between $8,000 and $10,000. An alternative to reduce the cost is to buy out retired servers from ITS which would still be usable for our graduates need. In any case, a space for the servers is still needed. The custodial room right next to SE 137 is suggested as an ideal place.

Software: The standard set of software which is currently being used on the SVSU campus, will be used in the new computers mentioned above. Therefore, no new software is required at this point.

Faculty offices: Two faculty offices will be required for the two new hires beginning in Fall 2017.

5. PROPOSED COURSE OFFERINGS

Fall semester

Course name	Type	In charge	Course given up	Replaced by
CSIS521-Software Engineering	Core	Dr. Cho	One undergrad course	New hire1
CSIS566 - IT Strategy	Core	New hire2	None	None
(Online) CSIS503 - Mobile Computing	Core	Dr. Corser	One undergrad course	New hire2

CSIS531 - Computer Architecture	Elective	New hire1	None	None
CSIS662 - Compiler Design and Implementation	Elective	New hire1	None	None
CSIS671 – Thesis	Thesis	Anyone including new hire1 and new hire2	None	None
CS216 (Evening) OR CIS301 (Evening)	Fast track	New hire2	None	None
Courses offered by other departments				
(Online/Hybrid) HS550- Medical Informatics for Health Management	Elective	Health Science department	None	None
CSIS510 – Project Management	Elective	Energy and Material department	None	None

Winter semester

Course name	**Type**	**In charge**	**Course given up**	**Replaced by**
CSIS586 - Cloud and Big Data Analytics	Core	New hire1	None	None
CSIS501 - Computer Networks and Security	Core	Dr. Dharam	One undergrad	New hire1
CSIS621 - Software Architecture and Design Pattern	Elective	Dr. Cho	One undergrad	New hire2
CSIS631 - Distributed Systems and High Performance Computing	Elective	New hire1	None	None
(Hybrid) CSIS633 - Information Security and Privacy	Elective	Dr. Rahman	One undergrad	New hire2
CSIS671 – Thesis	Thesis	Anyone including new hire1 and new hire2	None	None
CS216 (Evening) OR CIS301 (Evening)	Fast track	New hire2	None	None
Courses offered by other departments				
CMA550 - Experience Design	Elective	Communication and Media Admin. department	None	None
(Hybrid)ACCT611 – Financial Accounting Concepts **AND** (Hybrid) ACCT612 – Managerial Accounting	Elective	Accounting, Law and Finance department	None	None

(Hybrid/Online) LS615 - Ethics in the Profession	Elective	Leadership and Service department	None	None
RPW520 - Writing in Scientific & Tech Contexts	Elective	Rhetoric and Professional Writing department	None	None

Note: Students who would need CS 116 and/or CS 245 as part of their fast track courses, will be subject to register for a regular undergrad section.

Spring semester

Course name	Type	In charge	Course given up	Replaced by
CSIS582 - Artificial Intelligence and Expert Systems	Elective	Dr. Rahman	None	None
(Online) ETD515 - Technology Leadership and Management	Elective	Instructional Technology and E-learning department	None	None
CSIS671 – Thesis	Thesis	Anyone including new hire1	None	None

Summer semester

Course name	Type	In charge	Course given up	Replaced by
CSIS576 - Computer Graphics	Elective	Dr. Cho/New hire	None	None
CSIS671 – Thesis	Thesis	Anyone including new hire1	None	None

6. COURSE DESCRIPTIONS

CSIS586 - Cloud and Big Data Analytics

This course will focus on two emerging data management technologies: cloud computing and big data. Topics include challenges of cloud computing and managing big data; interrelation between cloud computing and big data; types of cloud computing, virtualization techniques; data

visualization, managing data on cloud computing resources with current vendors, applications; and future impacts. Prerequisite: None. Credits: 3

(Online) CSIS503 - Mobile Computing
This course presents both big picture and detailed coding considerations in contemporary mobile application development. Students read current trade publications and scholarly research to acquire up-to-date understandings of business and engineering issues in the field. Students design and develop code on three mobile platforms, Android, iOS, and PhoneGap. Because of rapid change in the mobile computing field, it is possible that additional platforms may be added mid-course. The course teaches conceptual fundamentals, problem solving and design skills, and coding skills through lectures and lab sessions. Students demonstrate accomplishments but completing a semester project. Platform trends, market, and business model are discussed. Advanced topics include location-based services, geo-social services, offline capable apps, UI/UX design. The course presents emerging technologies and tools used to design and implement multimedia applications for smartphones taking into account the technical constraints relative to storage capacity, processing capacity, display screen, communication interfaces, as well as user context and profile. Prerequisite: None. Credits: 3

CSIS501 - Computer Networks and Security
The course covers advanced topics in computer networks and network security. We will discuss various network and software issues and vulnerabilities, security related attacks and their countermeasures, and challenges in designing and deploying a secure infrastructure in both private and enterprise networks. Prerequisite: None. Credits: 3

CSIS521 - Software Engineering
This course focuses on each major phase of the software lifecycle, including requirements analysis, requirements modeling, design modeling, and project management. Topics include process models and methodologies, including unified process and agile methods, program specification, program validation and verification technique, and project maintenance and configuration management. Prerequisite: None. Credits: 3

CSIS566 - IT Strategy
This course examines the role and impact that IT plays within modern organizations. Topics will include planning and staffing the IT department, IT support of the organization, dealing with organizational changes and challenges, developing core competencies, increasing information system availability and performance, and adjusting to ever changing technologies. Various tools that are used to assist in the creation and measurement of IT value will also be studied. Prerequisite: None. Credits: 3

CSIS621 - Software Architecture and Design Pattern
This course covers the fundamental concepts of software architecture and design pattern. Topics include different architectural styles, design patterns, and architecture-centric design approach. Prerequisites: CSIS521 - Software Engineering OR equivalent. Credits: 3

CSIS582 - Artificial Intelligence and Expert Systems
This course presents a study of artificial intelligence and expert systems. Topics include PROLOG programming, search methods, knowledge acquisition, knowledge representation including belief

networks, knowledge validation, neural networks, expert system development including uncertainty management methods such as statistical, symbolic, and fuzzy logic, expert system shell, survey of current expert systems, and future trends. Prerequisites: CS316 - Data Structure and Algorithm OR equivalent. Credits: 3

CSIS531 - Computer Architecture
The course covers fundamental structures in modern microprocessor and computer system architecture design. Topics will include computer organization, instruction set architecture, CISC and RISC architecture, memory system design, pipelining, and other advanced topics to exploit parallelism. The class will focus on quantitative evaluation of different design alternatives and tradeoffs between cost and performance as well as between hardware and software. Prerequisites: CS331 - Computer Organization and Assembly Language OR equivalent. Credits: 3

CSIS676 - Computer Graphics
This course presents the basic concepts of computer graphics generation, software and hardware requirements for graphics, and its applications. Topics include the X window system, graphics computation over networks, functions of the client and server, graphics input and output devices, interactive program development, graphical and text attributes, construction of panels and buttons, algorithmic techniques for window clipping & viewport transformation, 2-D object transformation, 3-D object modeling and animation, and graphics applications. Prerequisite: CS316 - Data Structure and Algorithm OR equivalent. Credits: 3

CSIS631 - Distributed Systems and High Performance Computing
This course will focus on to the design, analysis, and implementation of distributed and high performance computing and their applications. Topics include parallel and distributed algorithms and architecture; parallel programming; performance-oriented computing; concurrency control; fault tolerance; GPU architecture and programming; load balancing; memory consistency model; message passing interface; performance analysis; and different applications/tools. Prerequisites: CS446 – Operating Systems OR equivalent. Credits: 3

CSIS662 - Compiler Design and Implementation
This course covers the theory and practice of compilers. Topics include a study of grammar, languages, BNF (Backus-Naur Form), finite state automata, top-down and bottom-up parsing methods, parsing with and without backups, operator precedence grammars, LL(k), and LR(k) parsers. The course also presents an introduction to compiler development including scanners, syntax checking, and code generator. Prerequisites: CS461 - Theory of Computation OR equivalent. Credits: 3

(Hybrid) CSIS633 - Information Security and Privacy
This course covers the technical and administrative aspects of information security and privacy. Topics include identifying and addressing critical security and privacy issues involved in the design, development and deployment of information systems in a business process; identification of information assets; assess and mitigate the risks and vulnerabilities in information assets; levels of protection and response to security incidents; technical and managerial responses; issues in managing the security and privacy of information systems; security and privacy issues in

enterprise, e-commerce, web, mobile, social networking systems; legal, policy and usability issues. Prerequisites: None. Credits: 3

(Online /Hybrid) HS550 – Medical Informatics for Health Management
Description: This course will provide a comprehensive overview of healthcare information technology (HIT), including the effects of the external environment and government policies on its evolution; the expanded role of the executive information officer; business intelligence and analytics; how current technologies and major innovations are changing the way healthcare executives manage information systems for short-and long-range planning, how to assess and acquire clinical information systems to appreciate the value HIT brings to the healthcare organization. Prerequisites: None. Credits: 3

CMA550 - Experience Design
Explores and critiques the design of kiosks, gaming, mobile devices, productivity applications and design tools, and the navigation, look & feel of web sites for a global audience. Students learn design processes in individual and group projects to construct electronic interfaces for usability and elegance. Prerequisites: None. Credits: 3

CSIS510 - Project Management
This course will review the design process and customer need identification. Students will learn modeling and optimization, planning and scheduling, material/process interaction, life cycle analysis, reliability and risks, economics and costs, ethics and societal considerations. The focus will be on understanding how to manage technical product development projects effectively. Prerequisites: None. Credits: 3

(Hybrid) ACCT611 – Financial Accounting Concepts
Courses emphasizes the information presented in financial reports. The information disseminated as well as the effect of economic activity on such financial statements will be covered. Prerequisites: None. Credits: 2
AND
(Hybrid) ACCT612 – Managerial Accounting
The use of accounting information to plan, evaluate, control resources and report information within the organization. Coverage will include issues facing service and manufacturing enterprises, as well as analytical tools which assist in decision making. Prerequisites: CSIS611/ACCT611 – Financial Accounting Concepts. Credits: 2

(Online) ETD515 - Technology Leadership and Management
Survey of historical and contemporary theories in organizational communication, including such topics as human motivation, persuasion, relational development, conflict, culture, leadership, and networking. Prerequisites: None. Credits: 3

(Hybrid/Online) LS615 – Ethics in the Profession
Explores the role of federal, state, and local legislative bodies in public administration. Topics include legislative structures, lawmaking, program development, delegation, oversight, and the importance of electoral politics. Prerequisites: None. Credits: 3

RPW520 - Writing in Scientific & Tech Contexts
Principles, strategies and practices for communicating technical and scientific information for professional and scholarly purposes. Topics include recasting content for different audiences (e.g., professional, public); complying with document standards (e.g., IEEE, ASME, ISO); establishing and maintaining professional authority; and understanding and accepting professional responsibility. Special emphases on reports, proposals, descriptions, and correspondence. Prerequisite: Advisor permission for thesis/project track students. Credits: 3

CSIS696 - Internship
Off-campus internship related to applications of the discipline. The student and advisor must agree before enrollment. Prerequisite: Advisor permission. Credits: 3

CSIS697 - Special Topics
Independent project or research in the discipline. Prerequisite: Advisor permission. Credits: 3

CSIS671 – Thesis
Individual/group project or research work under assigned supervisor. May enroll multiple times to fulfill 6 credit requirement for Thesis track. Prerequisite: Advisor permission. Credits: 3

7. REFERENCES

[1] URL: http://www.iie.org/Research-and-Publications/Open-Doors/Data/International-Students/Fields-of-Study/2012-14

[2] URL: http://www.iie.org/Research-and-Publications/Open-Doors/Data/International-Students/Fields-of-Study/2013-15

[3] URL: http://www.svsu.edu/cfsc/typesoffinancialaid/scholarships/academicscholarships/

8. ABBREVIATED FACULTY VITAE

Faculty Name: Scott D. James **Title:** Professor **Department:** Computer Science and Information Systems **School:** Science, Engineering and Technology	**Office:** SE-176	**Office Phone:** 964-4896 **Office Email:** james@svsu.edu

Degrees – School – Year

PhD – Oakland University – 2001

MS – GMI Engineering & Management Institute – 1993

BS – Saginaw Valley State University – 1985

Most Recent Publications (limit to 6):

1. Hansen, J., E. Hansen, A. Tapp & S. James, "The Use of E-collaboration in Educational Technology and Development Courses at Saginaw Valley State University", Proceedings for 22nd Society for Information Technology and Teacher Education International Conference held in Nashville, TN, on March 7 – 11, 2011, pp. 321-326.
2. Hansen, J., E. Hansen, A. Tapp, S. James & M. Bidgoli, "Using Assignments in a VB.Net Class to Create Simulations for Use by Teachers", Proceedings of Society for Information Technology & Teacher Education International Conference held in Chesapeake, VA, 2010, pp. 1912-1916.
3. Hallouche, F., S. James, J. Hansen & M. Bidgoli, "Capstone Experiences: Lessons Learned in Mastering CS Competencies", World Congress on Engineering and Computer Science held in San Francisco, California on October 22-24, 2008, presented and published in the conference proceedings, pp. 584 – 586.
4. James, S., M. Bidgoli & J. Hansen, "Why Sally and Joey Can't Debug: Next Generation Tools and the Perils They Pose", The Midwestern Conference of the Consortium for Computing Sciences in Colleges held in Holland, Michigan on September 26-27, 2008, presented and published in the conference proceedings, pp. 27 – 35.
5. James, S., M. Bidgoli & J. Hansen, "Least-Criteria Record Matching In Database Systems", The 2007 IEEE International Conference on Electro/Information Technology held in Chicago, Illinois May 17-20, 2007, presented and published in the conference proceedings, pp. 674 - 678.
6. James, S., M. Bidgoli & J. Hansen, "Practical Network Programming In .NET", The 2007 IEEE International Conference on Electro/Information Technology held in Chicago, Illinois May 17-20, 2007, presented and published in the conference proceedings, pp. 679 - 684.

Research Interest

Software Engineering
Algorithm Design
Artificial Intelligence
Software Quality and Software Process Improvement
Best Practices
General Programming
Computer Science Education

Faculty Name: Moe Bidgoli
Title: Associate Professor
Department: Computer Science and Information Systems (CSIS)
School: Science, Engineering and Technology (SET)

Office: SE-175

Office Phone:
989-964-4198

Office Email:
bidgoli@svsu.edu

Degrees – School – Year
MS, University Of Nebraska - Lincoln, 1979
BS, University Of Tehran, 1974

Research Interests: Database systems, Storage & retrieval systems, and Computer Science Education.

Most Recent Publications (limit to 6):

1. "Capstone Experiences: Lessons Learned in Mastering CS Competencies" (with Farid Hallouche, Scott James, John Hansen), World Congress on Engineering and Computer Science, 22-24 October, 2008.

2. "Why Sally and Joey Can't Debug: Next Generation Tools and the Perils They Pose." The Midwestern Conference of the Consortium for Computing Sciences, (with Scott James and John Hansen), 26 to 27 September 2008.

3. "Least-criteria Record Matching In Database Systems" (with Scott James and John Hansen), Conference Proceedings of the IEEE International Conference on Electro/Information Technology, Chicago, Illinois, 17 to 20 May 2007, 674-678.

4. ".NET Network Programming Models", Proceedings of the World Multiconference on Systemics, Cybernetics and Informatics, July 2005, pp 20-26 (with John C. Hansen, Scott James, and Farid Hallouche).

5. "A Course in IT Project Management", Proceedings of the World Multiconference on Systemics, Cybernetics and Informatics, July 2005, pp 1-3 (with John C. Hansen, Scott James, and Carol Richardson).

6. "Computing Industry Maturity", Proceedings of the World Multiconference on Systemics, Cybernetics and Informatics, July 2004, pp 36-40 (with John C. Hansen, Scott James, and Elizabeth Hansen).

Awards:
1) Scholarship for completing M.S. in Computer.
2) Northland College Outstanding Faculty Award (April 4, 1985).
3) SVSU Merit Award (1989-1990).
4) SVSU Landee/Teaching Excellence (April 13, 1991).
5) Michigan Association of Governing Board of State Universities (April 6, 1992).
6) Saginaw Valley State University Faculty Association Service Award (May 1, 1995).
7) SVSU Terry Ishihara Award, for outstanding co-curricular involvement. (April, 2005).
8) SVSU FA Faculty Mentor Award (October, 2011).

A Short List of University Services:
1) Academic Policies Review Committee member (1987-1988).
2) Member of Grade Grievance Committees (1988 – till present)
3) PPC Committee member (1990-1992, 1996-2000).
4) SVSU Faculty Association Executive Committee member (1991-2000, 2005-till present).
5) College of Education Advisory Committee (1990-1994).
6) CAPC Committee member (1993-1995).
7) SVSU Faculty Association Treasurer (1994-1997).
8) SVSU Faculty Association Secretary (1997-1998).
9) Chairperson of CSIS department (1990-1994).
10) Teaching Improvement and Innovation Task Force (1991-1995).
11) Faculty Advisor of the SVSU student Chapter of the ACM (1987- 2012).

Faculty Name: Il-Hyung Cho **Title:** Associate Professor **Department:** Computer Science and Information Systems **School:** Science, Engineering and Technology	**Office: SE178**	**Office Phone: 989-964-2044** **Office Email: icho@svsu.edu**

Degrees – School – Year

PhD – Computer Science, Clemson University, 2000

MS – Computer Science, Bowling Green State University, Bowling Green, OH, 1990

BE – Electronics & Computer Engineering, Yonsei University, Seoul, South Korea, 1987

Most Recent Publications (limit to 6):

1. Hong Y. Park, ***Il-Hyung Cho***, Sonia Park. Creativity and the Market for Entrepreneurs in ICT Industry, International Forum on Knowledge Asset Dynamics, Dresden, Germany, 15-17 June 2016.
2. Hong Y. Park, ***Il-Hyung Cho***, Sook Jung, Dorrie Main. Information and communication technology and user knowledge-driven innovation in services. Cogent: Business & Management, Volume 2, Issue 1, 2015.
3. Jung S, Ficklin SP, Lee T, Cheng CH, Blenda A, Zheng P, Yu J, Bombarely A, ***Cho I***, Ru S, Evans K, Peace C, Abbott AG, Mueller LA, Olmstead MA, Main D. The Genome Database for Rosaceae (GDR): year 10 update. Nucleic Acids Res. 2014 42(1):D1237-44.
4. Kate Evans, Sook Jung, Taein Lee, Lisa Brutcher, ***Ilhyung Cho***, Cameron Peace, Dorrie Main. Addition of a Breeding Database in the Genome Database for Rosaceae. Database, Oxford Journal (2014).
5. Ficklin SP, Sanderson AL, Cheng CH, Staton S, Lee T, ***Cho I***, Jung S, Bett KE , and D Main. Tripal: A Construction Toolkit for Online Genome Databases. Databases, Oxford Journal (2011).
6. T. Lee, ***I. Cho***, C. Peace, S. Jung, P. Zheng, and D. Main. GenSAS-An Online Integrated Genome Sequence Annotation Pipeline. 4th International Conference on BioMedical Engineering and Informatics (BMEI), Shanghai, China (2011). Also published in IEEE Xplore Online Journal.

Research Interests

Object Oriented Software Engineering
Big Data Analysis
Cloud Computing
Computer Programming in Early Childhood

Prospective Graduate Courses to Teach (relevant to new degree)

CSIS521: Software Engineering
CSIS621: Software Architecture and Design Pattern
CSIS531: Computer Architecture
CSIS662: Compiler Design and Implementation

Faculty Name: Khandaker Dr. Rahman Rahman, PhD **Title:** Assistant Professor **Department:** Computer Science and Information Systems (CSIS) **School:** Science, Engineering and Technology (SET)	**Office:** SE-177	**Office Phone:** 989-964-2528 **Office Email:** krahman@svsu.edu

Degrees – School – Year	**Research Interests:**
PhD in Computational Analysis and Modeling - Louisiana Tech University - 2013 MS in Computer Science - Louisiana Tech University - 2011 MS in Mathematics - Louisiana Tech University - 2011 MS in Computer Science and Engineering - University of Dhaka, Bangladesh - 2009 BSc in Computer Science and Engineering - University of Dhaka, Bangladesh - 2007	Cybersecurity Cyber behavioral biometrics Machine Learning Knowledge discovery from data Image Processing

Most Recent Publications (limit to 6):

1. K. A. Rahman, Ryan Moormann, Danielle Dierich, and Md. Shafaeat Hossain, *"Continuous User Verification via Mouse Activities"*, in 8th International Conference on Multimedia Communications, Services and Security (MCSS) in Krakow, Poland on November 24, 2015. Full manuscript is available in the Communications in Computer and Information Science (CCIS) series from Springer.
2. Dustyn Tubbs and K. A. Rahman, *"Facial Expression Analysis as a Means for Additional Biometric Security in Recognition Systems"*, in 8th International Conference on Multimedia Communications, Services and Security (MCSS) in Krakow, Poland on November 24, 2015. Full manuscript is available in the Communications in Computer and Information Science (CCIS) series from Springer.
3. Dustyn Tubbs and K. A. Rahman, *"Mitigating Facial Recognition Attacks: A Brief Overview of Offensive and Defensive System Methods"*, in Annual Conference of Michigan Space Grant Consortium (MSGC), University of Michigan at Ann Arbor, October 31, 2015.
4. K. A. Rahman, D. Dierich, and R. Moormann, *"Proposing a Novel Defense Mechanism to Spoof Attacks Targeting Keystroke Dynamics based Cyber-behavioral Biometric Systems"*, 13th Annual Security Conference, Las Vegas, May 2014.
5. K. A. Rahman, K. S. Balagani, and V. V. Phoha, *"Snoop-forge-replay Attacks on Continuous Verification with Keystrokes"*, in IEEE Transactions on Information Forensics and Security (TIFS), Volume: 8, Issue: 3 (2013), pp. 528-541.
6. K. A. Rahman, K. S. Balagani, and V. V. Phoha*, "Making Impostor Pass Rates Meaningless: A Case of Snoop-forge-replay Attack on Continuous Cyber-behavioral Verification with Keystrokes"*, IEEE Computer Vision and Pattern Recognition Workshop (CVPRW), Colorado Springs, USA, 2011.

Grants Awarded

1. Michigan Space Grant Consortium, MSGC (a NASA funded federal program) fellowship 2016-2017 on behalf of my student Joseph Maes. *Amount: $2,500.00*
2. The Herbert H. and Grace A. Dow Foundation Grant 2016 – 2017 on behalf of my student Joseph Maes, *Amount: $3,500.00*
3. The Herbert H. and Grace A. Dow Foundation Grant 2015 – 2016. *Amount: $2,500.00*
4. SVSU Faculty Research Grant 2015-2016. *Amount: $3,500.00*
5. SVSU Faculty Research Grant 2014-2015. *Amount: $5,000.00*
6. Michigan Space Grant Consortium, MSGC (a NASA funded federal program) fellowship 2014-2015 on behalf of my student Dustyn Tubbs. *Amount: $2,500.00*

7. SVSU Faculty Association student scholarship 2014-2015 on behalf of my student Danielle Dierich. *Amount: 1,500.00*

US Patent Pending
Title: "Movement Pattern based Screen Unlocking for Smart Mobile Devices".
Inventors: K. A. Rahman and D. J. Tubbs.

Prospective Graduate Courses to Teach (relevant to new degree)

CSIS633: Information Security and Privacy
CSIS682: Artificial Intelligence and Expert Systems

Faculty Name: George Corser, PhD **Title:** Assistant Professor **Department:** Computer Science and Information Systems (CSIS) **School:** Science, Engineering and Technology (SET)	**Office:** SE-179	**Office Phone:** 989-964-2756 **Office Email:** gpcorser@svsu.edu

Degrees – School – Year PhD, Computer Science/Informatics, Oakland University, 2015 MS-CAIS, University of Michigan-Flint, 2011 BSE Civil Engineering, Princeton University, 1985	**Research Interests:** Vehicular Ad-hoc Network (VANET) Privacy, Cybercrime, Mobile Computing, Computer Science Education, Cybersecurity Education, Internet of Things (IoT) Policy

Most Recent Publications (limit to 6):

1. G. Corser, H. Fu, A. Banihani, "Evaluating Location Privacy in Vehicular Communications and Applications," in IEEE Transactions on Intelligent Transportation Systems, vol.PP, no.99, 2016
2. G. Corser, A. Arenas and H. Fu, "Effect on vehicle safety of nonexistent or silenced basic safety messages," IEEE ICNC, Kauai, HI, 2016.
3. G. Corser, et al., "Privacy-by-Decoy: Protecting location privacy against collusion and deanonymization in vehicular location based services," IEEE IV 2014, Dearborn, MI, 2014.
4. G. Corser, et al., "Endpoint protection zone (EPZ): Protecting LBS user location privacy against deanonymization and collusion in vehicular networks," IEEE ICCVE 2013 Las Vegas, NV, 2013.
5. G. Corser, et al., "Knowing the Enemy at the Gates: Measuring Attacker Motivation," in Int'l Journal of Interdisciplinary Telecommunications and Networking (IJITN), vol.5, no.2, 2013.
6. G. Corser, "A tale of two CTs: IP packets rejected by a firewall," ACM InfoSecCD 2012, Kennesaw, GA, Best Paper Runner Up Award, 2012.

Grants Awarded

1. *Title:* TEDxSVSU, a project to present independently-organized TED Talks at Saginaw Valley State University, Source: SVSU Foundation Resource Grant Program, *Amount: $5500*.
2. *Title:* Safety-Silence Tradeoff Equation, a Faculty-led Undergraduate Research Project, *Source:* SVSU Undergraduate Research Program, *Amount:* $1000.
3. *Title:* Vehicular Ad-hoc Network Privacy, *Source:* SVSU Faculty Research/Professional Growth (FRPG) Program, *Amount*: $3260.
4. *Title:* Collaborative Computer Science Education, *Source:* Herbert H. and Grace A. Dow Professor Award, *Amount*: $5000.

Synergistic Activities

1. IEEE Experts in Technology and Policy (ETAP), Project Leader. Serves as conference speaker and lead author on a forthcoming policy whitepaper, "End-to-end security and privacy by design for the Internet-of-Things."
2. Michigan Infragard, Member. Collaborates with law enforcement and businesses to evaluate cybersecurity issues. "InfraGard is a partnership between the FBI and the private sector. It is an association of persons who represent businesses, academic institutions, state and local law enforcement agencies, and other participants dedicated to sharing information and intelligence to prevent hostile acts against the U.S." (www.infragard.org)
3. Early Career Academy, Board Secretary. Provides governance and executes legal documents for the Board of Education of this charter high school which dual enrolls 11th and 12th graders in college computer courses.
4. Cardinal Solutions, Faculty Advisor. Leads computer science students in the development of Android and PhoneGap mobile apps, database-driven websites and virtual reality experiences for real-world clientele.

Prospective Graduate Courses to Teach (relevant to new degree)

CSIS503: Mobile Computing

Faculty Name: Dr. Poonam Dharam **Title:** Assistant Professor **Department:** Computer Science and Information Systems **School:** Science, Engineering and Technology	**Office:** Science East - 172	**Office Phone:** 989-964-4191 **Office Email:** pdharam@svsu.edu

Degrees – School – Year

Ph.D., Computer Science, University of Memphis, TN, USA, Aug. 2015
M.S., Computer Engineering, Santa Clara University, CA, USA, Dec. 2010
B.E., Computer Science, Visvesvaraya Technological University, Bangalore, India, Jun. 2009

Most Recent Publications:

1. P. Dharam, Q. Wu, and N. S. V Rao. *Advance Bandwidth Scheduling in Software Defined Networks.* In Proceedings of the Global Communications Conference, San Diego, CA, USA, December 6-10, 2015 (GLOBECOM15)
2. P. Dharam, Q. Wu, and Y. Wang. *Deadline-constrained Bandwidth Scheduling in High-performance Networks*. In Proceedings of the International Conference on Computing, Networking and Communications, Honolulu, Hawaii, USA, February 3-6, 2014 (ICNC14)
3. P. Dharam. *On Bandwidth Reservation for Optimal Resource Utilization in High-performance Networks*. In Early Research Doctoral Showcase of the International Conference for High-performance Computing, Networking, and Analysis, Salt Lake City, Utah, USA, November 10-16, 2012 (SC12)
4. P. Dharam, Q. Wu, and M. Zhu. *On Bandwidth Reservation for Optimal Resource Utilization in High-performance Networks*. In Proceedings of the 37th Annual IEEE Conference on Local Computer Networks, Clearwater, Florida, USA, October 22-25, 2012 (LCN12)
5. P. Dharam and Q. Wu. *Advance Bandwidth Reservation with End-to-End Performance Guarantee in High-performance Networks*. In Proceedings of the International Conference on Computer Communication Networks, Munich, Germany, July 30-August 2, 2012 (ICCCN12)
6. Q. Wu and P. Dharam. *Advance Bandwidth Scheduling with Minimal Impact on Immediate Reservations in High-performance Networks*. In Proceedings of the 13th IEEE/IFIP Network Operations and Management Symposium, Maui, Hawaii, USA, April 16-20, 2012 (NOMS12)

Research Interests

Runtime monitoring of web applications: Using anomaly based techniques to detect both software and network based vulnerabilities,

Monitoring network protocols to detect and prevent unknown security attacks,

High-performance Browser Networking for optimizing the delivery and performance of web applications.

Prospective Graduate Courses to Teach (relevant to new degree)

CSIS501: Computer Networks and Security

<table>
<tr><td>Faculty Name: Chad M. Dewey

Title: Lecturer

Department: Computer Science and Information Systems

School: Science, Engineering and Technology</td><td>Office: SE-173</td><td>Office Phone: 989-964-4483

Office Email:
cmdewey@svsu.edu</td></tr>
<tr><td colspan="3">Degrees – School – Year

PhD – Currently attending. Expected graduation May, 2018

MS – Master of Science in Information Assurance – Davenport University - 2010

BS – Bachelor of Science in Network Security – Davenport University - 2008</td></tr>
<tr><td colspan="3">Most Recent Publications (limit to 6):

1. Mr. Chad Dewey and Mr. Chad Shaffer, Advances in Information Security Education, IEEE International Conference on Electro-Information Technology, 6 pages</td></tr>
<tr><td colspan="2">Grants Awarded

Not eligible (still performing Doctorate studies)</td><td>Research Interest

Penetration Testing
Internet of Things Security
Privacy
Open Source Software Implementation</td></tr>
<tr><td colspan="3">Prospective Graduate Courses to Teach (relevant to new degree)

CSIS501: Computer Networks and Security

CSIS631: Distributed Systems and High Performance Computing

CSIS633: Information Security and Privacy

(*Pending graduation from Doctorate program)</td></tr>
</table>