Greetings From The Chair

Welcome to the Department of Computer Science. I am very proud of our department and its contributions to the overall mission of the University. Led by experienced educators, our undergraduate and graduate programs continue to grow and prepare our students for dynamic careers or higher education in the fields of Computer Science and Information Technology.

In fall 2018, we submitted proposals for three new programs: a combined 5-year B.S./M.S. program in Computer Science; an online in M.S. Cybersecurity; and a new Artificial Intelligence graduate concentration. Over the years, we have received many inquiries from our students, as well as prospective students, about the combined program. We are hopeful we will be able to offer the program in the near future. Our new online Cybersecurity Certificate Program was launched this fall as well, and the current students will be completing the five-course program in spring 2019.

In addition to their teaching duties, our CS faculty engage in performing research, as well as preparing proposals for various governmental and educational grants. Several faculty from Physics, Education, Chemistry, and Computer Science were recently awarded a grant from the National Science Foundation (NSF), entitled “Mentoring, Research, Leadership, and Community to Increase Undergraduate Retention and Graduation in STEM.” This award is one of 85 new S-STEM awards that were made by the Division of Undergraduate Education this year and we are grateful to Dr. George Grevera from Computer Science for his contribution in securing this grant. Finally, Dr. Wei Chang, the faculty in charge of the graduate Cybersecurity concentration, is currently preparing an NSF grant in the areas of Cybersecurity Education and Privacy.

Allison Smith, a senior majoring in Computer Science and a member of the Computer Science Club, is planning to form a series of workshops to promote computational thinking and computer science among local young women. (Continued on Page 2)
During the week of July 9th, Dr. Babak Forouraghi, Dr. Wei Chang, and Mr. Ameen Hai hosted a workshop for 15 undergraduate students from China. Over the course of one week, the students were introduced to programming, artificial intelligence, web development, and cybersecurity. This workshop was created to foster future cooperation between St. Joseph’s University and Shanghai University, in the hope of recruiting Computer Science graduate students.

The new Graduate Online Cybersecurity Certificate Program began in Fall with a successful launch! The diverse group of students hail from California, Louisiana, New Jersey, and Pennsylvania. In September, the application process began for a new cohort of students for the spring-fall cycle.

IT major Jessica Atoo has returned to her position as Office Assistant and we welcome our newest Assistant, Cornelia Brower, a CS major.

In June, Ameen Hai (MSCS/2018) attended the IEEE Big Data Conference in Seattle, Washington, where he presented a paper co-published with Dr. Babak Forouraghi.

SAP America visited the department twice during the fall semester. In October, they presented the STAR Program (see page 6 for details) and in November, SAP interviewed seniors who were interested in full-time employment upon graduation. SAP is also currently recruiting the CS & IT students for summer internship positions.

Junior Computer Science major Lubov Grynyshin will spend the spring semester studying in Copenhagen, Denmark. Hav en sikker rejse!
♦ Online courses are currently being developed for the new Master’s in Cybersecurity.

♦ There are on-going discussions regarding a minor in Computer Science and Digital Music.

♦ Dr. Jonathan Hodgson, Professor Emeritus, attended the fall semester Guest Speaker Series. His generous donations enable the department to host these presentations throughout the academic year!

♦ A proposal for the new Artificial Intelligence concentration in the Computer Science Master’s Program has been submitted.

♦ The department is working on an initiative for the Five-Year Computer Science BS/MS Program.

♦ Dr. Forouraghi is currently conducting research in the area of Data Science with graduate students Yifan Chen and Wenaho Ruan. This research will subsequently lead to publications.

♦ On November 10th, under the leadership of Dr. Wei Chang, the following students participated in the ACM Regional Programming Contest at Wilkes University in Wilkes-Barre, PA: John Coleman, Joseph Dougherty, and Evan Pomponio. This is a prestigious, national programming competition. The department is grateful to the students and Dr. Chang for devoting their time to prepare and representing the department and university.

♦ On October 11th, Joseph McCleery, Lindsey DelCarlion, and Arianna Esposito, from the Kinney Center, presented insightful information regarding their current research and possible internship opportunities. The department looks forward to working with them in the future!

♦ Allison Smith, a senior majoring in Computer Science, is planning to form a series of workshops to promote computational thinking and Computer Science among local young women. The workshops will teach coding, using Scratch and Alice. Allison hopes to expand this program to include other underrepresented members of schools in the area.

♦ The department has established a relationship with Accolade, Inc., who will actively recruit CS and IT majors for internships and full-time employment. Accolade will visit the department throughout the academic year.

♦ Congratulations to freshman and Computer Science major Briana Bair, a McNulty Scholar! The John P. McNulty Scholars Program awards students four-year full and partial tuition scholarships to pursue a degree in one of the natural sciences, mathematics, or computer science. Scholars also receive intensive faculty and peer mentoring and participate in ongoing leadership training and professional development.

The Computer Science Department wishes you a Merry Christmas and a Happy & Healthy New Year!
Network sniffer plays a very important role in both cybersecurity and hacking. It uses the WinPcap development kit to capture the data flowing through the network card, analyzing and filtering it, to quickly find the network sniffer using the “C” language. It can detect the network cards in the computer, realize the selection of the network cards, and open the promiscuous mode. It can monitor data packets in the network, analyze which protocol the data packets are using, and the various fields of each protocol header.

This project helped me strengthen the relationship between various protocol frames and deepen the understanding of corresponding data frames used in different layers of a computer network. It can be seen that the sniffer is actually a double-edged sword. Network sniffer technology can pose a certain threat to cybersecurity if it is used by hackers; however, the sniffer can effectively detect the data packet information transmitted on the network and the analysis and utilization of such information transmitted on the network and the analysis and utilization of such information contributes to the cybersecurity maintenance. This presentation will detail the pros and cons of sniffer and its functions.
The last three attacks are related to the “C” programming language, they are Format String attack, Buffer Overflow attack, and Return-to-libc attack. During the presentation, I will introduce the mechanism of each attack and describe how I implemented it in my lab environment. I will also briefly talk about some countermeasures which can prevent the attack. At the end of the presentation, I will discuss what I learned from this project and summarize similarities and the difference between these attacks. Finally, I will present a live demo of some attacks.

"As the world is increasingly interconnected, everyone shares responsibility of securing cyberspace.”

~ Newton Lee
On October 23rd, Justin Lynch (‘12) and June Huynh, of SAP America, presented the STAR Program to the undergraduate class. STAR (Student Training And Rotation) is a multi-year undergraduate rotation program, designed to provide a co-op to students with the ultimate goal being full-time employment and integration with SAP.

STAR provides students hands-on experience and they receive a full-range of training, including business, technical, and soft skills prior to entering their assigned area. Graduates of this program will likely find their ideal job in the areas of software development, service & support, product management, or consulting. The Computer Science Department looks forward to a continued, successful partnership with SAP!

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EYE ON IT > 3D Camera

Red Digital Cinema Camera Company has a smartphone with the capabilities of a holographic display screen. The phone provides 3D viewing to project images, such as interactive maps. The phone was available through pre-order and began shipping in late October!
HSI 101 AND AN OVERVIEW OF THE MISUSE OF VIRTUAL CURRENCIES BY CYBER CRIMINALS

Abstract
SSA Landers will provide a brief overview of the broad mission and investigative responsibilities of Homeland Security Investigations (HSI). One of HSI’s primary investigative responsibilities is to investigate those cyber criminals and other transnational criminal enterprises that exploit the internet for illicit purposes, including the use of virtual currencies. SSA Landers will also provide an overview of the misuse of virtual currencies with a particular focus on the misuse of Bitcoin by transnational criminal organizations in various cyber crimes and cyber-enabled crimes.

Biography
Supervisory Special Agent (SSA) Ryan Landers supervises the Cyber Crime Investigations Task Force (C2iTF) at the U.S. Department of Homeland Security (DHS), Homeland Security Investigations (HS I) in the Philadelphia office. SSA Landers previously served as the Cyber Crime Advisor to the Assistant Secretary for Cyber Policy at DHS Headquarters in Washington, D.C.

The C2iTF is currently comprised of several federal, state, and local law enforcement agencies in a unified effort to combat the exploitation of the internet for criminal purposes. The C2iTF’s primary responsibilities include the interdiction of Darknet supplied contraband, including fentanyl and other dangerous drugs from China and other international sources of supply; the disruption and dismantlement of transnational drug trafficking organizations, including cyber enabled clandestine laboratories responsible for the manufacturing and distribution of drugs via the Darknet and Clearnet; the investigation of the misuse of Bitcoin and other cryptocurrencies to launder illicit drugs and other criminal proceeds; and other traditional cyber crimes, including Cyber stalking, business email compromises, and the digital theft of export controlled data and intellectual property. SSA Landers has been a criminal investigator with several U.S. law enforcement agencies, including the U.S. Naval Criminal Investigative Service (NCIS), the U.S. Department of Justice, Office of the Inspector General (DOJ/OIG), the U.S. Department of Homeland Security, and Homeland Security Investigations (DHS/HSI) for the last 17 years. During SSA Landers’ career, he has conducted a broad scope of criminal investigations, including but not limited to rape, death, larceny, narcotics, explosives, firearms, public corruption, money laundering, illegal exports, Darknet smuggling, and weapons of mass destruction.

In April, 2013, during his tenure at HS I in Newark, New Jersey, SSA Landers initiated of of HSI’s very first undercover cyber investigations into the Darknet marketplaces, where users buy and sell various illegal goods, such as firearms, stolen credit cards, counterfeit currency, fraudulent documents, explosives, and toxins. This complex transnational investigation resulted in several arrests in multiple countries for a range of violations, including weapons smuggling, manufacturing of weapons of mass destruction, attempted murder, and others. SSA Landers’ undercover cyber experience has been sought after by various components with HSI, as well as other federal, state, and international law enforcement agencies.

“The cybercrime fighters are regarded as superheroes. They’re highly intelligent and have this alien-like, advanced-type knowledge within themselves. It’s something that impressed me every day.”

—Chris Hemsworth
As a goaltender for SJU Club Women’s Ice Hockey, Elizabeth DiFilippo (senior, majoring in Computer Science) acknowledged, “the most difficult part of balancing sports and academics is the fear that I won’t have enough time to complete my assignments or fully study for exams.” She also stated that participating in this club sport has improved her time management skills and forced her to be organized. “I have to develop lists and schedules to allocate enough time to complete my assignments, prepare presentations, and study notes.” A highlight of being a goaltender for St. Joe’s was playing in the DVCHC All-Star game last April.

Brittany Heartwell-Miller, a Junior majoring in Computer Science, is Captain of the Women’s Soccer Team and plays outside back. When asked how she balances athletics and academics, she admitted, “It is especially difficult to balance such an academically rigorous major when I am in-season in the fall with a heavy travel schedule and missing classes.” To date, the highlight of playing soccer for St. Joe’s was winning the Atlantic 10 regular season in her freshman year (2016).

Computer Science Junior, Tim Johnson, is an outfielder for SJU’s baseball team. “I’d say the most difficult part of balancing sports and academics is missing classes. It puts a lot more pressure on me to learn material on my own, but I make it work.” The highlight of playing baseball for St. Joe’s was beating Notre Dame last year on a walk-off home run: “The way our team came together and celebrated at the end was an awesome feeling.”

JOSEPH GRAYAUSKIE (‘07)  
Software Developer  
Accolade, Inc.  
SERVICE ORIENTED ARCHITECTURE  
(SOA)

Abstract
The internet and the app stores have changed software development, distribution, and maintenance. Enterprises are in a constant state of developing and deploying new software while maintaining existing applications at the scale of the internet. A software crisis would be inevitable, except for techniques that have been created out of necessity. SOA is one of them.

Biography
Joe graduated from St. Joseph’s University in 2007 with a degree in Computer Science. Please see the Alumni Network page for a detailed update!

“A technology architecture expresses fundamental and foundational aspects of physical design for some piece of technology.”  
~Thomas Erl

BALANCING ACADEMICS

“THE MOST DIFFICULT PART ... IS MISSING CLASSES.”

We interviewed three student athletes and asked how they juggle coursework while playing a sport.
Highlights
The CSVI Summer Experience provided the ideal environment to apply practical knowledge of concepts related to cybersecurity. Working with Homeland Security has proven to be a valuable opportunity to gain hands-on experience and to further my career path toward becoming a cybersecurity specialist.

GREGORY JONES (’19)
Web Content Developer
Under Armour Global Headquarters
Baltimore, MD

I had the opportunity to return to Under Armour Global Headquarters this summer working with the IT service management team as web content developer. I was tasked to design and develop web application prototypes for an in-house employee self-service catalog utilizing Sketch, Adobe XD, HTML, and CSS.

This project was my first experience in actually going through an entire development cycle which included conducting extensive UX research for existing pain points, developing new designs, and reviewing the back-end portal database.

“The companies that do well are the companies that do math.” ~Kevin Plank
Mohammed Alanazi (M.S./2017) reports he has invented a new digital device called Wearable Pill Box Reminder, for which he received a Patent. He also started a company called PillGo. Mohammed is diligently working on this endeavor, hoping PillGo will be successful.

Joe Grayauskie (B.S./2007) was a member of the Men’s Soccer Team while attending SJU. He is a Software Engineer at Acocolade, Inc., responsible for developing and designing the software that will help reinvent the healthcare industry. His wife, Caitlyn McCrosson, also graduated from SJU in 2011 and she received her Master’s in 2012 in Special Education. She currently teaches at AIM Academy. Their son, Cooper, is 18 months old.

Dr. Suzan Köknar-Tezel (B.S./1985-M.S./1993) reports that she and her husband, Dr. Ahmet Tezel, are enjoying retirement in Florida. Suzan has a part-time position at a cruise terminal and has mastered the Ukulele to the point where she is now teaching others to play! Suzan and Ahmet are also in the preliminary stages of planning a cruise. We wish them all the best!

Ameen Abdul Hai (M.S./2018) is an Adjunct Instructor for the Computer Science Department. In Fall, 2019, he will attend Temple University, where he will pursue a PhD in Computer Science, specializing in Machine Learning.

Luigi Nuñez (B.S./2017) recently visited the department! After graduation, Luigi spent a year as a Global Health Corps fellow in Uganda. While undergoing trainings and retreats on leadership in the public health sector, he worked at Population Services International as an E-Learning Officer. After the end of the fellowship, he served as a consultant for three months in Uganda. Luigi is now working as the Associate Monitoring Advisor for malaria and WASH in Washington, D.C.

We enjoy hearing from you! Please feel free to share your personal and career news at anytime. Email updates to csci@sju.edu or fill out the online alumni form. We will celebrate your achievements in the Offline Observer.