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 Spring, 2019, our proposals for three new programs were approved by the University: a combined 5-year B.S./M.S. program in Computer Science; an online M.S. Cybersecurity; and a new graduate Artificial Intelligence (AI) concentration. Our new online M.S. in Cybersecurity will allow our current Cybersecurity Certificate students to take five additional CS courses to receive their online master’s degree. We are currently in the planning stages to create undergraduate concentrations in cybersecurity and artificial intelligence in the upcoming academic year.

Dr. Wei Chang, the faculty in charge of the graduate Cybersecurity programs, submitted an NSF grant proposal in the area of Cybersecurity Education. The main goal of the proposal is to identify new ways to design, build and operate cyber systems, protect existing infrastructure, and motivate and educate individual about cybersecurity. If the grant is funded by NSF, the department will be able to create a virtual cybersecurity platform, which will be freely available to students and educators across the country.

To promote high school-college partnerships, we are planning a series of free workshops for local high school students and teachers. Our goal is to start a pilot Cybersecurity/AI educational program for a few high schools and gradually expand that. We truly believe this initiative is an important step in addressing the growing demands for Cybersecurity and AI specialists in this technologically advanced world.

To encourage interdisciplinary CS+X collaborations at the University, the department has begun new initiatives to work closely with Health Informatics, Teacher Education, and Physics Departments. Our goal is to create educational opportunities for students who wish to incorporate computer science in their own disciplines.

(Continued on Page 2)
Congratulations to Dr. George Grevera on his promotion to Full Professor!

The following students received Graduate Assistant awards for the spring semester: Yifan Chen, Manchang Feng, Youbin Huang, Wenhao Ruan, and Jiajie Zhu.

Two additional online courses were created for the spring 2019 semester. Although created specifically for the Cybersecurity Certificate Program, all graduate students have an option to enroll. Many thanks to Jess Atoo (IT Major) and Emma Grace (Education Major) for assisting with video captioning!

Dr. Chang, and Ameen Hai will travel to Atlanta, Georgia, over the summer to attend the SmartData 2019 Conference.

Dr. Wei Chang submitted an NSF grant proposal in the area of Cybersecurity Education.

The department is proud to announce that the following new programs have been officially approved:

- 5-Year CS/MS Degree Program
- Master’s Degree in Cybersecurity
- Artificial Intelligence Concentration in the Master’s Program.

Message From The Chair

(Continued)

Our internship/co-op program is continuing to grow. Last year, representatives from SAP interviewed several students for summer co-op positions, internships, as well as full-time employment. In June, 2019, Anna-Maria Berezovski, a rising CS junior, started her first full-time summer co-op at SAP. Our goal is to recruit more co-op students next year. We also have created a new partnership with Unisys, which will, hopefully, result in more internship/co-op opportunities in summer, 2020.

If you are a former students reading this newsletter, we would love to hear from you!

“Technology, like art, is a soaring exercise of the human imagination.”

~ Daniel Bell
MARIEL BERGER & ZACH NELSON

_Fantasy Football Predictions_

Our project is _Fantasy Football Predictions_. The goal is to be able to come up with predictions and suggestions for users on football players, using their statistics to decide who they should choose to have on their fantasy team. The user will use the website as a mecca to find out how each player and team are doing on a week-to-week basis. It is a one-stop shop for all things football and cumulative statistics for their favorite NFL player. They can look for players from a particular team or a certain position to completely build their fantasy team in all areas.

DARRELL BERRY & JUSTIN BRANCO

_FitPlay Mobile Fitness App_

For our Senior Project, we decided to create a mobile fitness app that we named _FitPlay_. This app implements Google Maps API paired with Fitbit API to deliver runners’ needs into the palm of their hand. Google Maps API is used to create dynamic maps while Google’s Geolocation API is applied to detect real-time tracking of your mobile device. This means that your favorite routes can be tracked and saved in our real-time Firebase database. Also included with dynamic route tracking, runs are automatically timed with real-time distance tracking. Users are able to save runs in the runner’s log and refer back to them. If users prefer not to use the app while running, there is a manual option to enter a user’s exercise with distance, time, and pace tracking.

Another feature of this fitness app is the ability to locate places near your location to run or workout. We implemented Google Places API which includes the Place Picker API, an interface that allows users to search for any place within a certain region and get real-time information back. This feature is perfect for users looking for a nearby gym or a healthy restaurant. Also, it’s perfect for runners looking for a nearby park or trail to get in some quick miles.

Darrell had a vision of giving the app a feature where you could play a game with your friends based on the routes you ran. The Firebase would store run logs in real-time between players when they wanted to create challenges among themselves. We then wanted the app to present leaderboards based on who finished the race first, who was the fastest, etc. However, we did get this far in developing the app.

ELIZABETH DiFILIPPO & ALLISON SMITH

_Analyzing EEG Data_

“Electroencephalogram (EEG) is the electrophysiological technique for the recording of electrical activity arising from the human brain” (Frey, Lauren C. et al., pp.4). In a study conducted at Temple University, EEG caps containing thirty-six channels measured the cerebral activity of patients with and without epilepsy. From this data taken by The Neural Engineering Data Consortium, we extracted information about our patients, including their age, diagnosis, and the rate at which data was taken from each respective EEG channel. We then performed statistical analysis on this data using R Studio. The primary avenue for doing so was by computing the correlations between the channels of different patients and between channels within a single patient, utilizing the Fast Fourier Discrete Transform (fft) to analyze our plots in segments. Additionally, we created Java programs to assist in our analysis of the EEG data and expedite the process of creating analysis scripts in R Studio.

RYAN BIRCH & MARVIN CLAUDE

_The Mystic Wood Mobile App_

_Mystic Wood_ is a role-playing board game made for two to four players. Each player is tasked with completing their own individual quests in which each quest varies, depending on the character selected. The goal of the game is for players to successfully complete their quest and escape the _Mystic Wood_. The first player to successfully complete this task is the winner. The goal of the project is to recreate the _Mystic Wood_ board game to be played on a mobile device. The project was made in the Android Studio development environment, using the Flutter mobile development framework, which allows for the creation of applications that work on both Android and iOS devices. The application is coded in the Dart programming language, which is the default language used by Flutter.

“Every project is an opportunity to learn, to figure out problems and challenges, to invent and reinvent.”

~ David Rockwell
Individual Projects

MOMAR CISSE
Artificial Intelligence and Object Detection
The purpose of this project is to show how to train any machine to detect and recognize objects using neural networks. For this project, I trained a neural network to detect and recognize different pairs of shoes. To teach my neural network, I used Google Colab, which offers free GPU and Tensorflow, an open-source software library used for machine learning.

JACK COLEMAN
Hawk Language
Dependent types are slowly becoming a more important idea in programming language research with many newer languages adopting forms of dependent types to enforce safety. However, these languages tend to either be complicated for beginners (Idris) or limited (Rust’s refinement types). A solution to this problem is the language I created called Hawk. Hawk is a strongly dependently typed scheme, thus it has the simplicity of scheme with the safety that dependent types provide. This allows Hawk to be a great introduction into the world of dependent types.

GREGORY JONES
Hawk Ride
Hawk Ride is a convenient student escort service mobile app. Students use this app to request a ride and a student driver provides transportation to the students throughout our campus. Our current system under Public Safety uses a radio dispatch communication system, which causes a long wait period. Hawk Ride is a quick and efficient on-demand service that will allow automated dispatch to reduce wait-time and it is a free service that would be used to keep our students safe on and off campus.

JERRICK JUANILLO
Stratego
My Senior Project for the semester was to take a traditional tabletop game and build it through various applications. The game I chose to do was Stratego, which involves two players who take control of about 40 pieces in a battle of wits and try to find their opponent’s flag first. I used Unity 3D to make this board game, as well as C# code that affects the board and pieces. I planned to make this board game a human player vs. computer player, so I used AI algorithms to try to make the pieces move on their own. Overall, my goal was to make a functioning game board that can be played between a human player and artificial intelligence.

ALEX MASGAI
First Responder Drone
Through the combination of programming and electronics, I designed and created a first responder drone that detects humans in disasters and texts their GPS coordinates so that they can be rescued. This project used Ardupilot to handle the physics of flying the drone, OpenCV and Tensorflow to detect objects in real-time, and the Twilio API to send a text message of the person’s location.

JANIECE LYNAE MURRAY
Christly Rooted Social Site
Social Media is a community in which users create online accounts to electronically communicate and share information, ideas, and other content. The goal for Christly Rooted is to be a social site that offers a community to Christians who desire to live Christ-like. This community is to give scriptural encouragement and empowerment to users. Christly Rooted, developed in PHP, CSS, and HTML, has a navigation bar for seamless maneuvering through pages and site locations. Featured through Christly Rooted are user blogs; pastoral sermons; The Holy Bible, which offers different languages and versions; and a playlist of Christian based podcasts.

PATRICK O’LEARY
Appointment Scheduler
My intention with this project is to make scheduling a doctor appointment easier for a patient. Calling a doctor’s office to schedule an appointment with a receptionist is subject to human error and potential double booking. My project seeks to cut out the human error and allow a patient to view the doctor’s schedule for availability. It also takes away the hassle of having to call an office when they are open. With SQL, I created a database and used XAMPP to facilitate it on a local host server. I then used PHP to create web pages for the database to be used with Bootstrap in creating a style for my web pages to display nicely. Overall, my idea for this project was increasing the convenience for the patients getting treatment from doctors.

ABIGAIL QUINNAN
MyCollection
MyCollection is a website created to help users sort and keep track of items in their collections. It is a database based website in which the user can input the name, date, and description of the item. The user can also message other users to talk about similar interests or to buy and sell items. It is a very user-friendly interface which allows the user to easily keep an electronic record of the items most important to them.
The video game industry has been changing since the creation of Pong in 1972. Since then, developers have changed the way we can create games. Instead of needing a lot of talent and a bank that will fund the development of a game, creators are able to make something right at home for the cost of absolutely nothing. I have decided to create Umbra, an indie-developed game using Unreal Engine 4. Unreal Engine has been used as a development engine since as early as 1998, creating some of today’s best games, such as Fortnite, Kingdom Hearts 3, and even Yoshi’s Wooly World.

Umbra is a third-person Action Role Playing Game (ARPG) that takes place in the fantasy kingdom of Umbra. You play as one of Umbra’s most beloved soldiers, fighting in multiple battles to protect your kingdom. As an unknown force invades the Kingdom of Umbra, you are tasked with protecting the King with your life. Little did you underestimate this force, and you awaken in an unknown area, not knowing what happened to the King. As you regain your memories, you learn the truth of what happened the day of the invasion. Umbra will include RPG elements, such as loot pickups; medical potions; multiple options, such as battle axes, swords, bows, and magic. You will be able to pick your own playstyle, whether you would like to bear swords or learn magic. All of this will become a necessity as you explore the Kingdom of Umbra and find the truth.
JUSTIN BRANCO
Delaware Valley Community Health
Philadelphia, Pennsylvania

My internship at Delaware Valley Community Health (DVCH) proved to be one of the most beneficial factors of my learning experience at St. Joseph’s University. The projects I was tasked with included: managing the setup and distribution of iPads to doctors, initializing the healthcare software necessary for doctor-patient interaction, developing new plans and alternatives for patients to connect with their doctors via technology, researching new healthcare technologies that would be beneficial for DVCH to implement, and working with IS/IT professionals to deal with any ongoing software/hardware problems DVCH may have.

My time at Delaware Valley Community Health taught me that the professional world is dynamic and fast paced. I found myself tasked with many projects at a single time. Many of the projects had to do with our Patient Portal, which is an online hub where patients can access their health records and talk with their healthcare provider without stepping in the office. I made changes to some of the technology that DVCH has to offer their patients, including the Patient Portal and their website. A key project was updating their email scripts using HTML. Another main project was implementing iPads into a healthcare provider’s everyday routine. The use of this technology would promote a closer relationship between patient and doctor and also allow doctors to access vital healthcare software on the go.

Although not all of the projects I was tasked with were completed before my departure from DVCH, I found that my presence at the company was not only beneficial for me, but to them as well. During this internship, I learned how to implement the skills I acquired in the classroom to everyday life.

YIFAN CHEN & WENHAO RUAN
On Development of Data Science and Machine Learning Applications in Databricks

Databricks is a unified analytics engine that allows rapid development of data science applications using machine learning techniques, such as classification, linear and nonlinear regression, clustering, etc. Existence of myriad sophisticated computation options, however, can become overwhelming for designers as it may not always be clear what choices can produce the best predictive model given a specific data set. Further, the ever-increasing dimensionality of big data sets is a challenge for data scientist to gain a deep understanding of the results obtained by a utilized model.

Our research provides general guidelines for utilizing a variety of machine learning algorithms on the cloud computing platform, Databricks. Visualization is an important means for users to understand the significance of the underlying data. Therefore, it is also demonstrated how graphical tools, such as Tableau, can be used to efficiently examine results of classification or clustering. The dimensionality reduction techniques, such as Principal Component Analysis (PCA), which help reduce the number of features in learning experiments, are also discussed.

To demonstrate the utility of Databricks tools, two big data sets are used for performing clustering and classification. A variety of machine learning algorithms are applied to both data sets and it is shown how to obtain the most accurate learning models employing appropriate evaluation methods. During the presentation, we will introduce the workflow of conducting an ML model training and describe the method to choose proper classification and regression algorithms. One of the data sets will be chosen to demonstrate how we implemented unsupervised learning (K-means) on an unlabeled data set for classification (Kernel SVM). We will also briefly discuss model evaluation and time efficiency. Finally, we will present the visualization of classification after applying PCA.
ALEX MASGAI  
BrickSimple  
Doylestown, Pennsylvania

BrickSimple is a software company that provides software solutions to other companies. Throughout the summer and during my senior year, I worked on quality assurance, develops, ASW, and research and development in blockchain technologies.

I debugged both the hardware and the software of a new fitness app for a client, rewrote the backend for a Django website, wrote a proof-of-concept decentralized application using Node JS and Solidity, deployed a mining node in Ethereum-based network, and wrote a Python script that installs, updates, and removes developmental tools. At the end of the summer portion of my internship, I presented my findings on blockchain research in a company-wide meeting.

“If you think you are worth what you know, you are very wrong. Your knowledge today does not have much value beyond a couple of years. Your value is what you can learn and how easily you can adapt to the changes this profession brings so often”.

~ Jose A. Aguilar

In early 2019, Giant Food Markets placed robotic assistants (AKA Marty) in 172 stores across Pennsylvania, Maryland, Virginia, and West Virginia. Marty reports spills and other potential hazards to (human) store employees. He also has the ability to scan merchandise and perform price checks. Marty is equipped with multiple cameras and is powered by rechargeable lithium batteries.
Graduation Awards

Nicholas Senatore
B.S. / Computer Science

Nick is active in student organizations on campus, including Radio 1851 Group, the first college radio station to broadcast in the United States; Squared Circle, the professional wrestling club; and the Computer Science Club. He is also a member of Upsilon Pi Epsilon, the Computer Science Honor Society. During the summer months, Nick interned at SAP Corporation and Comcast and volunteered to help a small start-up company. Previously, he worked with Dr. George Grevera on a multi-year National Science Foundation Grant in Computational Geometry. Nick will be joining Comcast Corporation upon graduation.

Manchang Feng
M.S. / Computer Science

Manchang graduates with a concentration in Cybersecurity and his academic performance in his area of specialization has been outstanding. In addition to his exemplary work as a Graduate Assistant, Manchang has been involved in and committed to various initiatives in the department to raise awareness regarding the importance of computer science education. In Spring, 2019, Manchang was inducted into the SJU Chapter of Upsilon Pi Epsilon. Manchang plans to pursue a teaching career in Computer Science.

Student Screenshots

• Congratulations to the following students who made the Spring 2019 Dean’s List!

  Computer Science Majors: Briana Baier, John Coleman, Abigail Corbett, Nadia Cugini, Elizabeth DiFilippo, Joseph Dougherty, Brittany Hartwell-Miller, Timothy Johnson, Andy Mac, Kara McLaughlin, Nicholas Senatore, Allison Smith, Sarah Strickland, Hao Wu.

  Information Technology Majors: Samuel Andaloro Alexandra Coyle, Kathryn Kelly, James O’Boyle.

• Anna-Maria Berezovski, a sophomore majoring in Computer Science, has been selected by SAP America (located in Newtown, PA) to participate in their Co-op Program. This program requires a commitment to work full-time over the course of two summers and part-time over the course of two fall semesters. Anna-Maria began the program in June.

• The Computer Science Club hosted a Study Break Session on Thursday, May 2nd. Milk and cookies were served! They are also planning to host their first Hackathon in fall!

• On May 16th, Computer Science majors Nicholas Senatore and Allison Smith were inducted into St. Joseph University’s chapter of Phi Beta Kappa, which is the oldest, most prestigious academic honor society in the United States.

• A paper written by Dr. Babak Forouraghi and his research students Wenhao Ruan and Yifen Chen, entitled On Development of Data Science and Machine Learning Applications in Databricks, has been accepted for publication by Services Conference Federation (SCF) 2019. This paper will be included in the Springer LNCS Proceedings of SCF 2019 (EI indexed) and will become available in Springer. The SCF 2019 Conference will be held in San Diego, California, June 25-30.

• Over the summer, Joseph Dougherty will intern for Delaware Valley Community Health, Inc.
Spring 2019 Events

Thursday, February 14
Spring Career Fair

Tuesday, February 26
Network Philly 2019

Monday, March 11 to Friday, March 15
Spring Break

Thursday, March 28
Upsilon Pi Epsilon (UPE) Induction Ceremony

Monday, April 1 to Monday, April 15
Senior Exit Survey / Online

Friday, April 5
Sigma Xi Research Symposium

Thursday, April 11
Guest Speaker—Mr. Vince Kelly, Cisco Systems

Tuesday, April 16
Phillies College Series / CS & Operations Night

Thursday, April 18
Internship & Graduate Research Presentations

Friday, April 19 to Tuesday, April 23
Easter Break

Thursday, April 25
Senior Project Presentations - Part I

Saturday, April 27
Computer Science Club Hackathon

Tuesday, April 30
Senior Project Presentations - Part II

Thursday, May 2
Study Cookie Break / Reading Day

Tuesday, May 14
Graduate Student Award Ceremony

Friday, May 17
Undergraduate Student Award Ceremony

Saturday, May 18
Commencement

Guest Speaker & Spring Events

Mr. Vince Kelly
Technical Solutions Architect
Cisco Systems

Mr. Kelly works with large corporations and assists in determining their future IT directions. He has a wide range of experience with current technologies and experience with a diverse, interesting customer base.

Mr. Kelly discussed some emerging technologies and shared advice on pursuing a career in a high-tech environment. This colloquium was well attended by both graduate and undergraduate students.

“IT’s not a faith in technology. IT’s a faith in people.”
— Steve Jobs

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— Steve Jobs
“The Hawk seems to enjoy dull gray days on Barbelin Tower. It is often barely visible from the ground. Not many of the graduating ‘Hawks’ realize there may be a real live one in some of their final photos taken on ‘Hawk Hill’ before leaving campus to continue life’s great adventures.”

~ Christopher Dixon

Hawk Photographs By:
Christopher Dixon, Archival Research Librarian, Post Learning Commons & Drexel Library

Enjoy the summer!
The 15th Annual Upsilon Pi Epsilon Induction Ceremony was held on Thursday, March 28 in the Presidents’ Lounge. The ceremony was followed by a luncheon for students, family, friends, faculty, and staff.

UPE is an honorary society whose membership consists of outstanding graduate and undergraduate students in the computing disciplines and was first organized at Texas A&M University in 1967. In 1997, UPE was admitted as a member of the Association of College Honor Societies. Since 2004, the Department of Computer Science has been a member of the UPE Lambda Chapter of Pennsylvania.

Congratulations to the following 2019 UPE Inductees:

**Graduate Students**
- Yifen Chen
- Manchang Feng
- Wenhao Ruan

**Undergraduate Students**
- Abigail Corbett
- Brittany Hartwell-Miller
- Timothy Johnson
- Kayla Roberts

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**CLASS OF 2019**
Students Share Post-Graduation Plans

- **Justin Branco** has accepted a position at Delaware Valley Community Health, Inc. (DVHC), located in Philadelphia. Justin interned for DVCH over the past year.
- Upon graduation, **Alex Masgai** will begin his employment at BrickSimple, located in Doylestown. Alex interned for BrickSimple in Spring 2019.
- **Khalid Alqahtani** is returning to Saudi Arabia. He will teach Computer Science courses to the employees of *The Ministry of Public Administration*.
- **Elizabeth DiFilippo** will be working as an Android Application Developer at LTK Engineering Services, located in Ambler, Pennsylvania.
- In July, **Abagail Quinnan** headed to Pensacola, Florida to start training as a Combat Systems Officer in the United States Air Force.
- **John Coleman** will prepare for graduate school, as he hopes to attend the University of Pennsylvania next year. He is currently seeking employment at Penn as well.
- **Momar Cisse** plans to continue his education in the field of Artificial Intelligence.
- **Nicholas Senatore** will be working as a Software Engineer for Comcast’s West Chester office.
- **Yifen Chen** will begin his position as a Software Development Engineer for Amazon in August.
Sarah Cooney (B.S./2017) was recently the recipient of a BCD scholarship. She received $5,000 toward her graduate studies and attended the FS-ISAC Summit in Chicago, IL in November, 2018. The Financial Services Information Sharing Analysis Center (FS-ISAC) awarded 14 women in the United States with its Building Cybersecurity Diversity (BCD) Scholarship and the recipients were recognized at the Summit. Sarah is a doctoral student at the University of Southern California, where her interests focus on artificial intelligence, game theory, and human behavior modeling.

Stephen M. Del Fra (B.S. /2003) reports that he is currently is employed by Accenture as a Technology Consulting Senior Manager.

Suzan Koknar-Tezel (B.S./1985, M.S./1993) reports that she is still playing Ukulele with a group and she volunteers two days per week at the Space Coast Chapter of the American Red Cross. Suzan recently enjoyed celebrating her daughter’s marriage at Yokayo Ranch in Ukiah, California. In January, she and her husband, Ahmet (SJU Professor Emeritus), will embark on a four month cruise. The ship will depart from Ft. Lauderdale and visit 60 ports. They are most excited to experience the Amazon River, Antarctica, Easter Island, Komodo Island, the Seychelles, Kenya, and Tanzania.

Brendan Szefinski (B.S./2017) was the Guest Speaker at the 15th Annual Upsilon Pi Epsilon Induction Ceremony. Upon graduation, Brendan began employment at SAP Corporation, located in Newtown Square, Pennsylvania. He was hired as a Technical Support Engineer on the Cloud Technology Team. In this capacity, he works directly with businesses that use this service by resolving critical issues, implementing the service for new customers, and devising custom solutions for unique business scenarios. Brendan was inducted into Upsilon Pi Epsilon on 7 April 2016.

We enjoy updates from Alumni! Please keep in touch. Updates can be emailed to csci@sju.edu or submitted using this link.