



# Cyber Eagles Reach Newsletter

Term: Fall  
Date: November 22, 2021

Editor: Jake Graves,  
Computer Science

## Cyber Club Happenings

by Jake Graves

On November 4th, there was a cyber eagles meeting where there was not one, but two student panels! Both groups of students had just gotten back from competing in cyber-related competitions, and presented their thoughts about each. The first group of students competed in the Temple University Collegiate Social Engineering Capture the Flag. This was a social engineering competition where the students had to use both social engineering tactics alongside the normal pen-testing strategies. We were able to hear how the students learned to work around things that they were unfamiliar with, and grow to meet the demands of the competition. One of the most interesting things that I heard at this meeting was something said by a student named Mia Fisher. Mia said,

**"A flawless security system will still be inherently weak because of the human factor."**

The second team competed in the Collegiate Penetration Testing Competition, which is another pen testing competition. The other largest takeaway was to be flexible. An incredible factor in these competitions is that when the students go in, they know nothing about what or who they are hacking. While there are many basic skills that students need to have before entering one of these competitions, there is almost no information given to the students prior to competing. Many students on the panel talked about how they used the internet to research things during the competition! This is all part of the preparation for a real-world job. However, these students did come equipped with the knowledge that they gained in the numerous cyber clubs that are on campus. Going to these clubs and learning the basic skills is what allowed these students to be successful. The classes and programs here at Tennessee Tech are amazing, but nothing will beat the knowledge you could gain from having numerous one on one sessions with peers who can teach you practical knowledge that will not only help you in your classes, but in your future too.

## QR Codes

Scan this QR to make sure that you do not miss and issue!



Scan this QR code to become a member of the Cyber Eagles



## Message from CEROC

*"No one who achieves success does so without acknowledging the help of others. The wise and confident acknowledge this help with gratitude."*

-Alfred North Whitehead

Thanksgiving is upcoming. Let us take a moment to acknowledge the people we are thankful for in our lives: at home and work. Let's wish them the best in their lives.

# What is Cyber Monday

by: Warren Proctor

Cyber Monday originates back to 2005 when the National Retail Federation (NRF) started noticing a flurry of online sales the Monday after Thanksgiving Day. Online merchants wanted the profit and sales that Black Friday produced for brick-and-mortar businesses. The first two big competitors of Cyber Monday were Walmart and Amazon. In 2008, though, Amazon had a 21% increase in sales compared to Walmart's 6% increase. In 2010, Cyber Monday sales hit \$1 billion for the first time. This number of sales seems paltry compared to the nearly \$10 billion spent in 2020. As time went on Black Friday and Cyber Monday became hard to distinguish as they generally had the same deals on items. There has always been a positive trend of growth over the decade of the existence of Cyber Monday. This was once again true for 2020 as people stayed home and avoided big crowds due to the coronavirus; 30% of people said they would shop on Cyber Monday versus the 24% who said they would shop Black Friday. For 2021 Cyber Monday lands on November 29th, remember to stay safe out there cyber shoppers!!

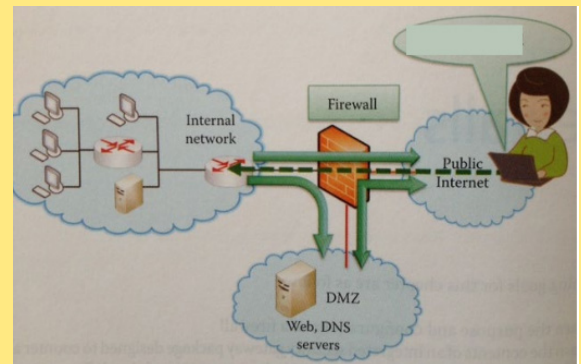
Source: <https://blackfriday.com/news/cyber-monday-statistics-and-history>

# Byte of Cyber Firewalls

by: Warren Proctor

Sometimes getting started in Cyber can be intimidating, and we get that! Byte of Cyber considers the mountain of information one encounters when getting started into a new field and we are here to breakdown some key words you might encounter on your cyber journey. This week we will be talking about Firewalls! To put it simply, "a firewall is a network security device that monitors incoming and outgoing network traffic based on a defined set of security rules" (Cisco). Think about this like a bouncer at a club or a host at a restaurant, these people monitor traffic coming in and out and manage the environment they are in. Firewalls have been in place for over 25 years and have been the outer layer of defense for network security. A firewall can be hardware, physical components, or software which is programs or operating systems used by a computer.

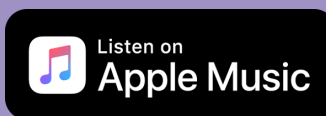
Source: <https://www.cisco.com/c/en/us/products/security/firewalls/what-is-a-firewall.html>



## Our Cyber Picks

These are our top 5 cyber podcast that we think you should listen to! You can find all of these podcasts on Spotify or Apple podcast.

1. Darknet Diaries
2. Smashing Security
3. Malicious Life
4. CyberWire Daily
5. Security Now



These are all very interesting and really get the listener excited to work in cyber! For professionals and beginners alike, these all contain useful information!

Dont forget to join the Cyber Eagles Club to gain access to a large community of students, professors, and alum who all are ready to connect with you and help!



# Hackers Behind Bars

by Asia McKissack

On October 26th, 12 people were arrested in Ukraine and Switzerland as part of an international law enforcement operation. These individuals arranged ransomware attacks on critical infrastructure and large organizations. These attacks have hit over 1,800 victims across 71 countries since 2019. Law enforcement confiscated 52,000 dollars, five luxury vehicles, and several electronic devices that agencies said are being examined to uncover forensic evidence for malicious activity. The suspects have been linked to LockerGoga, Megaxortex, and Dharma ransomware. Along with the ransomware attacks, they were in charge of laundering the ransom payments by funneling the ill-gotten Bitcoin proceeds through mixing services and cashing them out. Europol said in a press release that the suspects all had different roles; some were dealing with penetration and using multiple mechanisms to compromise IT networks. These compromises include brute force attacks, SQL injections, stolen credentials, and phishing emails with malicious attachments. The arrested individuals are also believed to have carried out the ransomware attack on Norwegian aluminum processor Norsk Hydro in March 2019. The joint task force involved authorities from France, Germany, the Netherlands, Norway, Switzerland, Ukraine, the U.K, the U.S, and Europol and Eurojust. Thirty other countries pledged to mitigate the risk of ransomware and harden the financial system from exploitation with the goal of disrupting the ecosystem.

Source: <https://thehackernews.com/2021/10/police-arrest-suspected-ransomware.html>

# Scholarship Student Highlight

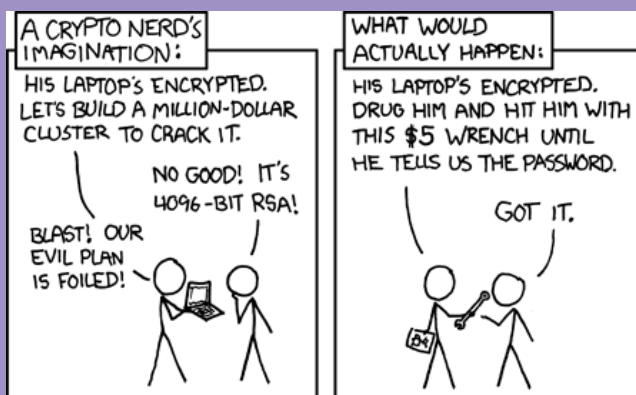


## Zachariah Threet

My name is Zachariah Threet. I was born and raised in Tennessee where I spent my adolescence tromping through the woods of Hendersonville. While in high school, I made youtube videos, practiced stand-up comedy, and did freelance videography on the side. I am a senior in computer science and will be starting my master's degree in the spring under the DOD CYSP scholarship where I will research Named Data Networking. I believe a background in networking will prepare me for a future within the ever-expanding domain of space. I see humanity's journey into the stars as one of the most challenging problems we have ever been faced with, and I want to be a part of it. I have greatly cherished the scholarship community on campus and am very grateful to be a part of it. In closing, I caution you against defining your success by the achievements of others. You are your own and have your things to offer. You don't have to do what everyone else is doing, but you must do something if you want to progress. The good news is that that you get to decide what that is.

## Fun Corner

Here is a social engineering comic that will definatly make you chuckle!



Source: <https://xkcd.com/538/>

# Bug Bounty Hunters

by Warren Proctor

On Monday Google announce that it will pay hackers, or security researchers, to find exploits and vulnerabilities, previously solved or otherwise, over the next three months as a part of a new bug program to improve the safety and security of the Linux kernel. There is a \$31,337 bounty for exploiting privilege escalation in a lab environment for each patched vulnerability.

Privilege escalation means assigning oneself higher roles as they further penetrate the system. An amount that can increase up to \$50,337 for solving exploits that take advantage of zero-day flaws in the kernel and any other attack techniques that are not documented. The program's goal is to unveil attacks that could be set against Kubernetes-based infrastructure to defeat isolation barriers (via NSJail) and break out of the sandbox to leak confidential information. This rewards program also exists with Android's VRP rewards, which allow researchers to demonstrate exploits which work on the mobile operating system which can be \$250,000 in bounties for recovery of the bugs.

Source: <https://thehackernews.com/2021/11/google-to-pay-hackers-31337-for.html>

# Current Student Highlight



## Mike Soare

Yo, what's up. My name is Mike Soare. I'm one of the defense cybersecurity group leads for the Cyber Eagles club. A little bit about my background, I'm originally from Knoxville, TN and pretty much spent my entire upbringing there. College wasn't exactly part of my "pathway" in life, but when I found out about Tennessee Tech's cybersecurity program, I thought it'd be a great fit. Throughout my time at Tech, I learned and experienced a lot especially through the Cyber Eagles club, so it's overall been a positive experience and would recommend anyone participate. I'm currently in my junior year so I still have some time before I'm out of school and in the workforce. Currently I'm looking to pursue a career as an incident responder (maybe even try out red teaming if my cards are played right) in either the government or private sector. Regarding advice, I'd highly recommend trying things out, and I mean really give it your best effort to find what "clicks" with you, then you can put your focus into making that interest into a hobby, and that hobby into a career... Overall, try things out and have fun. Cheers!

# Join Our Community

Have you joined the Cyber Eagles discord yet? We have social events there too! All computer science students are encouraged to come hang out and socialize with their peers. These events range from sports to video games, and they all are with people you will see in your classes! Join us and build a strong community of peers who you can discuss internships, schoolwork, and projects with!



The last switch meeting was a fighting games tournament, join the discord to see what happens next!

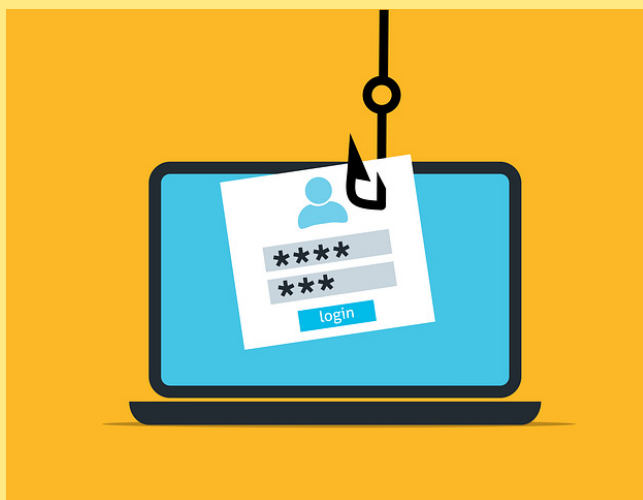
# How to Spot a Scam

by Jake Graves

Scams have been around ever since money has been. It is an unfortunate truth about how the world works, and in the digital age there are more scamming attempts than ever. Scammers can send out thousands of emails and attempt to scam thousands of people by just sending one email. However, if you learn the signs of what a scam is and how to effectively avoid it you can really save both yourself and your loved ones a lot of trouble! Scams can get very clever with how they present themselves, but here are a few key signs that should make you question whether or not what you are looking at is a scam:

- There is a time limit or deadline that creates urgency.
- There are typos.
- There is a request for personal information.
- The scammer may say to keep it secret.
- It seems too good to be true.

Every scam is different, so this list cannot possibly protect you from everything that may come your way. However, it is a great starting place when learning how to spot a scam quickly. Many scams will have at least one of these signs that point out that it is a scam. Be sure to help your friends and family by educating them on what a scam looks like and how to stay cyber safe!



## Faculty Highlight



### Muhammad Ismail

I am Muhammad Ismail, Assistant Professor of Computer Science and affiliated with CEROC and CESR. I am from Cairo, Egypt. It is funny to have this highlight in the 15 Nov issue, as I was born 20 Nov. 1985. I received my BSc. and MSc. in Communications Engineering from Ain Shams University in 2007 and 2009, respectively. I received my PhD degree in Electrical and Computer Engineering from University of Waterloo, Canada in 2013. I worked from 2013 - 2019 as a Research Scientist and Visiting Lecturer in Texas A&M University branch campus at Qatar. I joined Tennessee Tech in Fall 2019 as Assistant Professor. My research work covers security, operation, and planning aspects of cyber-physical systems (smart grid and healthcare) and 5G and beyond wireless networks. I received six best paper awards on my research from prestigious conferences such as IEEE ICC, IEEE Globecom, and IEEE IS. My experience in Tennessee Tech so far has been exciting, I met couple of excellent students, I taught some fun courses, I am developing with my team a testbed on smart grid, and I am starting new research and teaching projects (in Quantum networks!). Where I am heading? To the infinity and beyond :P My advice to students, 1) success only comes with hard work, so always work hard, 2) people fail not because they lack the skill but because they lack the spirit, so always have the spirit of a winner, 3) never lose the passion to learn something new, we work in a highly dynamic field.

## Alum Highlight



### Susan Jeziorowski

I'm currently a Cybersecurity Engineer in the DC Metropolitan Area and a member of the first ever US Cyber Team. I was born and raised in Chicago suburbia but decided to leave the Midwest after high school in pursuit of some warmer weather and an opportunity to play collegiate volleyball. After wrapping up my volleyball career and earning my B.S. in Computer Science from Tech, I stayed another year and a half to pursue my M.S. in Computer Science as an SFS CyberCorps scholar.

I am SO PROUD to be a Tennessee Tech Alum! My time at Tech was filled with fond memories, incredible people, beautiful views, and countless life lessons that continue to guide me in my post-graduate life today. Tech's top-of-the-line facilities, faculty, and resources make it one of the best universities in the state, so my best advice is to not take your time there for granted and be sure to use it wisely! Build relationships and friendships. Seize opportunities to try new things and see new places. Take your studies seriously and challenge yourself. College goes by faster than you may think, so be sure to enjoy it and take advantage of it while it lasts!

## Hackers and Healthcare

by Warren Proctor

When it comes to cyber-attacks, the health care industry has taken plenty of hits when it comes to ransomware, data breaches and other malicious attempts. Attackers target a wide range of businesses, but it seems that healthcare organizations seem to be targeted more frequently. For 11 years in a row the IBM Cost of a Data Breach Report healthcare had the highest industry cost of a breach, and these costs are beginning to grow exponentially. In 2020 \$7.13 million was lost to malicious attacks, while in 2021 that number grew to 9.23 million which is nearly a 30% increase. The places where Healthcare organizations seem to be experiencing the most vulnerabilities lie in their high-risk networked medical devices, insecure interconnected medical networks, lack of cyber training, weak or breached passwords, and outdated legacy technologies. The first area that healthcare organizations should work on is bolstering password security. The current programs and standards being used in certain industries lack the tools needed to keep the system secure.

Source: <https://thehackernews.com/2021/11/unique-challenges-to-cyber-security-in.html>

## Facebook Data Deletion

by Jake Graves

Facebook has recently changed its branding and company name to “Meta”, and with this change, they are changing more within the company. Meta has announced that they will be discontinuing their face recognition technology, and they will be subsequently deleting their database of over a million instances of user face data. One of the main reasons that Meta has decided to do this is because of the many privacies and legal concerns that have been and are currently being raised. Many people have been opposed to facial recognition technology as they are concerned for the racial and privacy concerns surrounding the technology. The company Meta has announced that they will be keeping the technology that powered their facial recognition technology, even though they are discontinuing the use of it. There are many privacy and ethical concerns when talking about the ways that this technology can be used, similar to the uses and ethical concerns we must think about every day as future cybersecurity professionals

Source: <https://thehackernews.com/2021/11/facebook-to-shut-down-facial.html>

# Research Highlight

by Maanak Gupta

Maanak Gupta is an Assistant Professor in the Department of Computer Science at Tennessee Tech University, USA, where he leads the ABCyS (Applied and Basic CyberSecurity) research group. His area of research includes security and privacy in cyber space focused in studying foundational aspects of access control, malware analysis, AI and machine learning assisted cyber security, and their applications in technologies including cyber physical systems, cloud computing, Internet of Things and Big Data.

Thanks to the smartest, passionate and ingenious students (or cyberwarriors) along with expert collaborators, I have worked (and working) with, our research group is currently involved in various cybersecurity projects broadly classified into two categories.

- a) Secure and Connected Cyber Physical Systems, and
- b) AI and Machine Learning Assisted Malware Analysis.

**Secure and Connected Cyber Physical Systems:** This project aims to develop foundational aspects of access control models and architectures for collaborative systems, novel anomaly detection approaches in smart farming, and mechanisms to deploy these technologies in cloud and edge environments.

**Students:** Tanjila Mawla, Sina Sontowski, Jeffrey C Kimmel, Mary Adkisson, Jessica Baugh, Arvin Sanchez, Glen Cathey, Thanh Pham Kim, Deepti Gupta

**AI and Machine Learning Assisted Malware Analysis:** This project aims of using machine and deep learning approaches to develop online malware detection and classification solutions for cloud IaaS and IoT. The group is also working towards finding novel adversarial attacks in malware analysis, and to develop resilient systems to prevent such attacks on trained models.

**Students:** Jeffrey C Kimmel, Austin Brown, Philip Brown, Kshitiz Aryal, Mary Adkisson, Daniel Simpson, Hayden Keller, Deepti Gupta

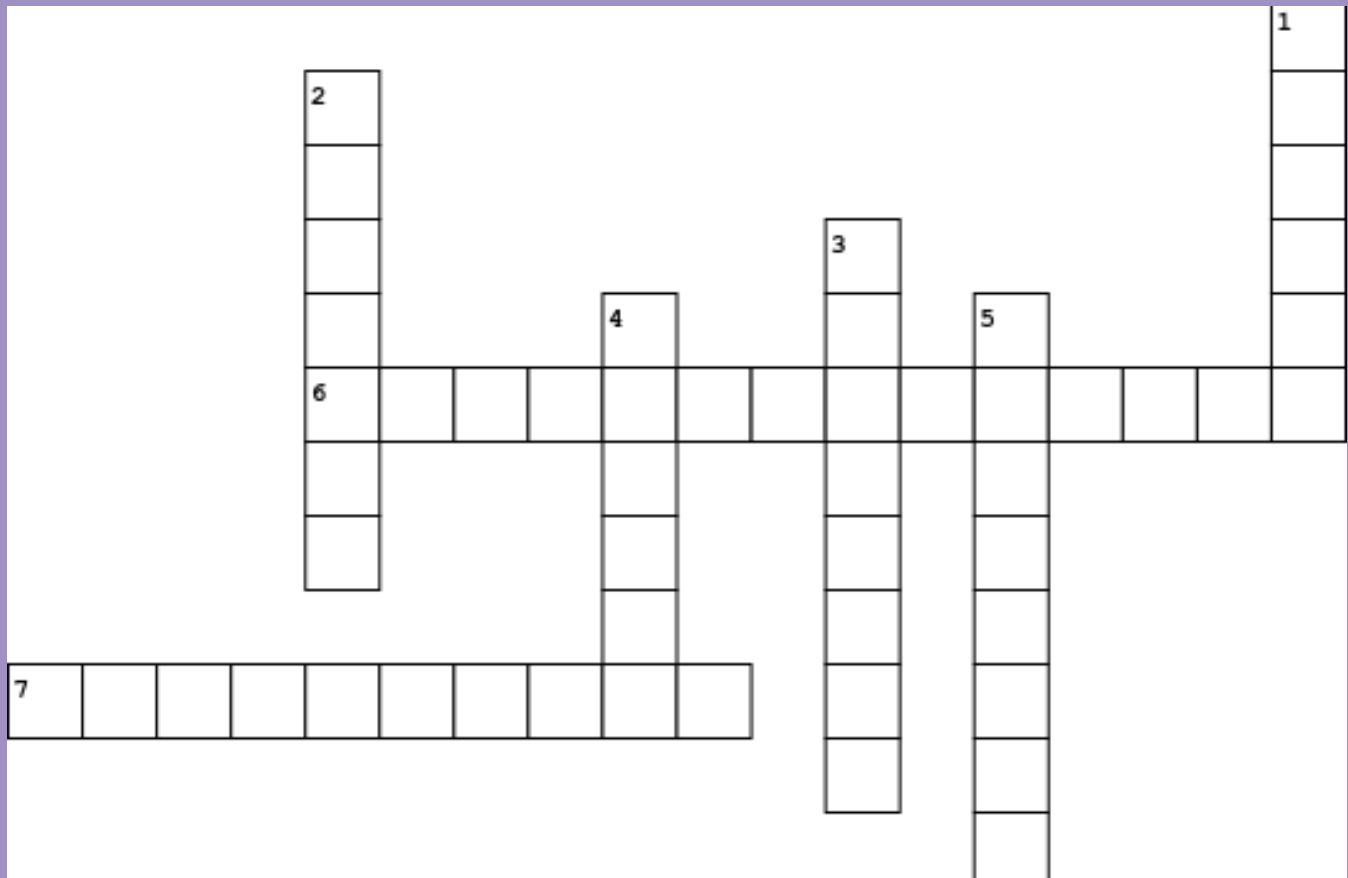
These projects have been partially funded/supported by grants from the National Science Foundation (NSF) and NASA.

## Social Engineering CTF

By Hallie Sevier

Over the weekend of October 22-24th, Tennessee Tech had a team compete in the Social Engineering Capture the Flag hosted by Temple University. The team included Hallie Sevier, Mimi Vertrees, Mia Fisher, Colin Lafever, and Hayden Keller. The competition was centered around social engineering with topics including OSINT, vishing, phishing, and more. Over the weekend, the team got to participate in workshops about social engineering. The workshops included ethics, vishing, and penetration test report writing. Each team member walked away from the competition feeling more confident in their social engineering skills and how to use it for the benefit of others. The team finished 3rd. You can learn more about the competition at <https://sites.temple.edu/socialengineering/>

# Cybersecurity Crossword Puzzle



## DOWN

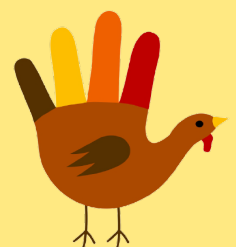
1. A horse with a surprise
2. Software designed to corrupt or steal information
3. Pretending to be someone you are not to extract information out of someone
4. A denial of service attack targets this
5. A brute force attack takes a long time to work on this

## ACROSS

6. Proving your identity
7. Encrypting files and holding them hostage for money

## Keep Your Family Cyber Safe

As you sit down with your families this thanksgiving, there is a lot to be thankful for. However, there is always something that you can do to give back. When you are talking with your grandparents or older relatives be sure to remind them of the dangers of scams. Senior citizens represent a large population that is constantly being harrassed and tricked by scammers. Help keep your loved ones safe this holiday season by sharing what you learn!





# Club Breakdown

by Asia McKissack

The WiCyS (Women in Cybersecurity) club is primarily for women they are welcoming to all! They meet once a month at dead hour, and there is food at every meeting. The last meeting, they introduced Capture the Flag. It's a place for women around campus to go to be introduced to more women just like them. If the free food and the interesting topics don't make you want to check them out the people will! You can meet people in your major that can help you out and introduce you to topics that can help in the long run.

"WiCyS has the mission to recruit, retain, and advance women in the field of cybersecurity. It is a place for anyone and everyone, not just women. We have monthly meetings, our next one is November 23rd. Come join us!"  
- Hallie Sevier Vice President of WiCyS

Cyber Eagles is a cyber based club that can introduced you to things happening in cyber. They have special guest and interesting topics that can help you in future classes. These meeting can also count as extra credit if your teacher allows. They meet every other Thursday at dead hour, and they offer free food at every meeting. Come and meet new people and learn more about the world of cyber.

"Cyber Eagles is place to learn cybersecurity practices in a friendly and welcoming environment alongside like-minded individuals. We welcome people of all experience levels and hope to provide you with a chance to grow. If you are even slightly interested, come check us out!" - Jesse Holland Vice President of Cyber Eagles

## Imposter Syndrome: What it is and Ways to Overcome It

By Jake Graves

Imposter Syndrome is when you begin to doubt your abilities and feel like a fraud. Someone who has Imposter Syndrome could be feeling self-doubt, burnout, and a large disconnect between their peers and themselves. The beginning of Imposter Syndrome could have started when your partner on a project took all of the work and you feel useless, or even if you just got a bad grade. This is all very normal for everyone to experience, but it can disproportionately affect successful individuals because it is hard to accept their own accomplishments. The first time that I really learned what Imposter Syndrome was during the WiCyS 2021 conference in Colorado, and as the speaker was explaining what Imposter Syndrome was, she asked the audience, who were mostly female, to raise their hand if they had ever experienced it. Almost the entire room had their hands up. Hundreds of people experience this every day, and many do not even know what it is called or how to combat the symptoms! Here are a few short-term ways that I combat my Imposter Syndrome when I feel like I shouldn't be where I am today:

- Talk to a mentor or peer that you trust and explain your frustrations. They can help bring context and affirm you in whatever endeavors you are pursuing.
- Avoid comparing yourself to other students or coworkers. No one is perfect, and even if someone looks like they have everything under control, they might also be struggling with the same things as you!
- Look for a community of people who can help mentor you in your field. We have so many great opportunities at Tech with the WiCyS student Chapter and the Cyber Eagles club.

Imposter Syndrome is a rampant issue in the cybersecurity community, especially in women and minorities who can sometimes feel out of place in the workforce. However, always remember that you have fought and worked to get where you are now. You have poured countless hours into advancing your mind and person, and you deserve to celebrate your achievements!

# Opportunities In Cyber

**James K. Goldston Cybersecurity Scholarship** \*(formerly the James K. Goldston INFOS-EC Scholarship): The purpose of this scholarship is to aid students in Tennessee who are pursuing undergraduate programs in computer engineering, computer science, cyber science, or cyber security. The scholarship is a one-time award of \$1,700 for one year. To be eligible, you must be planning to attend college/university and be involved in one of the previously mentioned programs. All applicants must have a GPA of 2.5 and be a full-time undergraduate at an accredited not-for-profit public or private college. More information can be found by scanning the QR code to the right!



**The Cyberinfrastructure Professional Intern Program (CIP)** is NCSA's internship program for those interested in pursuing a career in cyberinfrastructure. Interns with CIP will work directly with engineers to gain hands-on experience in the cyberinfrastructure operations of major leading supercomputing centers. Interns will spend two weeks training and learning about different cyberinfrastructure aspects at NCSA. Once they have completed their training, they will be paired with one of the advanced infrastructure groups at NCSA. Note that the deadline to sign up is Nov 19th, so you must act fast. To find more information please scan the QR code to the right.



## Scholarship Student Highlight

### **Kaitlyn Cottrell**

I'm Kaitlyn Cottrell; I'm from Knoxville and am a recipient of the SFS scholarship. My experience here at Tech has been very beneficial and helped me form great connections and skills through my involvement in Tech's cyber clubs. Through the help of these connections, I was able to get the SFS scholarship which has completely taken care of any financial concerns for attending college, as well as provided invaluable research and internship opportunities. I really feel the experience has helped prepare me for my future career and given me so much invaluable knowledge about the field that just wouldn't have been possible to get just from classes. I would advise other students to try their best to go to clubs on campus and meet as many new people as they can!



## Upcoming Events

Tuesday November 23: CTF Meeting 6-8pm

Thursday November 25: OCIG meeting 6-8pm

Tuesday November 30: CTF Meeting 6-8pm

Thursday December 2: Cybereagles Meeting 11-noon

Thursday December 2: DCIG Meeting 6-8pm (Subject to change)

Tuesday December 7: CTF Meeting 6-8pm

Thursday December 9: OCIG Wrap up 6-8pm

# Accolades

- Bradley Northern, Trey Burks, Marlana Hatcher, Michael Rogers, and Denis Ulybyshev, "VERCASM-CPS: Vulnerability Analysis and Cyber Risk Assessment for Cyber-Physical Systems", MDPI Communication journal, Special Issue on Secure and Trustworthy Cyber-Physical Systems, volume 12, number 408, 2021
  - Cathey, Glen, James Benson, Maanak Gupta, and Ravi Sandhu. "Edge Centric Secure Data Sharing with Digital Twins in Smart Ecosystems." Accepted in IEEE International Conference on Trust, Privacy and Security in Intelligent Systems, and Applications, 2021.
- 
- Congratulations to Dr. Siraj for winning the 2021 Visionary Leadership Academy Award
  - Our Cyber Team went to Temple University Collegiate Social Engineering Capture the Flag, and won 3rd



## PHD Student Highlight

### Rayhan Mithu

I am Rayhan Mithu, a computer science Ph.D. student working with Dr. Mike Rogers in Secure Industrial Control systems. I joined Tennessee Tech in Fall 2017 and am originally from Bangladesh. My focus is to contribute to forensic analysis of industrial control systems using Machine Learning. I am looking into creating a knowledge base of information gathered from a system ontology. This knowledge base can help forensic analysts identify features and isolate incidents that do not follow the system ontology. The experience at Tech has been wonderful for me so far. We have an extraordinary faculty group who are always there for us. The computer science department and CEROC have provided me with so many opportunities to learn and grow myself. I have made lots of friends and connections and hopefully will add some more before I leave. I would advise students to talk to our faculty and fellow students for any help they need. We have a great group of people in the department, and you must take advantage of that.

I have had the opportunity to work as an intern for the Electric Power Research Institute last year and after the experience, I have decided to work in the industry following my graduation.



**Give Us Your Feedback  
About Eagles Reach!**

