2016 IEEE/ACM TCF Information Technology Professional Conference (TCF-ITPC)

Program Book

Date: Friday, March 18, 2016 to Saturday, March 19, 2016
Time: 8:30AM to 5:00PM
Location: The College of New Jersey, Ewing, NJ

Sponsors:

Princeton / Central Jersey Chapter of the IEEE Computer Society

Princeton Chapter of the Association for Computing Machinery

IEEE Region 01 - Northeastern USA

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Thank you to our Sponsors, Speakers, Volunteers and Participants!

Also, thank you to the Trenton Computer Festival and the College of New Jersey.

Conference Logistics

Dear Participants,

Welcome to the **2016 11th Annual IEEE/ACM Information Technology Professional Conference at TCF**! We have an exciting program this year and are looking forward to seeing you.

Schedule:

The ITPC Conference program schedule is posted on our web site at: http://princetonacm.acm.org/tcfpro/pc2016.html.

Our conference presentations are scheduled to at **begin 8:30 AM to 5:00 PM on Friday, March 18, 2016** and include **extended sessions at 10:15 AM to 5:00 PM on Saturday, March 19, 2016** combined with the Trenton Computer Festival.

Registration:

Registration is in **Armstrong Hall on Friday at 8:15 AM in the Reception area near Room 154**. Your badge will be good for both Friday and Saturday sessions. Your registration also includes general admission to the Trenton Computer Festival.

On Friday, a continental breakfast will be available from **8:15 AM until 9:00**, prior to the start of the presentations in **Armstrong Hall near the registration area**.

Presentations:

All *Friday* presentations will be given in **Armstrong Hall rooms AR-154, AR-148, and AR-144.** All *Saturday* presentations will be given in the **Education Building**. The talks will be in classrooms equipped with a projector with a VGA style connector. We will also have a spare projector, just in case of a failure. Each presentation is 50-55 minutes and the audience averages 30 people including a diverse mix of practicing professionals, educators, interested engineers and students.

Lunch:

Lunch will be served on **Friday, March 18, 2016**, at **12:00 PM to 1:30 PM** in the **1855 Room**, which is a short walk across the campus from Armstrong Hall. Our lunch will include a facilitated networking session as well as some door prizes.

TCF Keynote:

The TCF keynote featured speaker, Chris Brogan, Founder and CEO of AssureNet will deliver a talk on "The Driving Force in Intelligent Safety" on **Saturday, 3:40 PM to 4:35 PM** in the **Education Building, ED115**.

Banquet:

There is a **Banquet on Saturday evening at 6:00 PM** and you are invited! We hope to see you there!

Advanced reservations are requested. The cost for the banquet $30. Payments are accepted and required at registration. Please make your reservation as soon as possible by sending an email to: Al Katz alkatz@tcnj.edu.

Posted Presentations:

Some of the presentations may be posted on the website: http://princetonacm.acm.org/tcfpro/

Maps:

The TCF **TCNJ Campus** map can be found at:
http://princetonacm.acm.org/tcfpro/TCF14_CAMPUS_Map.pdf

The **Brower Student Center** (**BSC)** floor plan can be found at:
http://princetonacm.acm.org/tcfpro/BSCFloorPlan.pdf

The **Education Building (ED)** floor plan will be provided at the TCF registration desk on Saturday.

Parking:

Parking for Friday, March 20, 2015 is in **Lots 3, 4 and 5** closest to the Brower Student Center (BSC), but any open parking lot is available for ITPC. Parking for Saturday is **in Lots 17 and 18** by the Education Building (ED).

Lodging:

Please refer to the TCF website: http://tcnj.pages.tcnj.edu/about/campus-info/hotels/ for more information. There is a group discount for "The College of New Jersey Conference."

TCF:

The **41th Annual Trenton Computer Festival** will be held at The College of New Jersey, Ewing Township, NJ on Saturday, March 21, 2015 between 9 am and 5 pm. This year's theme is "Starting Your Own Business / Entrepreneurship". The program includes over 50 panel sessions, workshops, tutorials, demonstrations, educational events and a Flea market. For more information go to: www.tcf-nj.org.

Thank you for your participation,

David Soll

Conference Chair

IEEE Information Technology Professional Conference
http://princetonacm.acm.org/tcfpro/

Presentation Schedule

	Friday, March 18, 2016 Information Technology Professional Conference		
	Development **AR-154**	**Technology& Security** **AR-148**	**Professional Development & Management** **AR-144**
8:00 AM	REGISTRATION		
9:00 AM	Noting the SQL Injection Carried on Web Applications Using Kali - Forensic Analysis Vamshi Krishna Gudipati	Keeping Personal Data Out Of Hackers' Hands Scott N. Schober	Models and Strategies for Effective Cybersecurity Spending Bill Agresti
10:00 AM	Building Realtime Web Apps with Angular and Meteor Michael Redlich	Hosting: A comparison of leased servers, cloud hosting and IaaS, with a focus on Amazon Web Services Steve Saporta	BDD and Continuous Testing in DevOps Era Rajkumar J. Bhojan
11:00 AM	High-Performance Web-Enabled Systems - An asynchronous, reactive, and data-driven, approach Enzo Alda & Monica Figuera	Background and Performance of Hadoop Hamoud Alshammari	Opportunities in Cybersecurity Jane LeClair & Denise Pheils
12:00 PM	LUNCH & FACILITATED NETWORKING SESSION		
1:40 PM	Architecture in an Agile World Dennis Mancl	Software as a Service (SaaS) Fredrick Dande	Architecting and Evaluating Discrete Integration Services in the Advancements of Digital Technologies of an Enterprise Vikas S. Shah
2:40 PM	An Algorithmic Solution for the "Hair Ball" Problem in Data Visualization Khalid H. Alnafisah	Big Data Market Research, in Today's Economy Donald Hsu	FIRST Robotics: The Farm Team for Tech Joe Levy
3:40 PM	Automated Surveillance System for Oil/Gas Pipeline Infrastructure Protection Vijayan K. Asari	Applying Machine Learning Techniques to Improve Quality Richard F. Eng	Industry, Academia, and Entrepreneurship: Insights from Riding the Metaphorical 3D See-saw Nikhil Yadav

9:00 AM – 9:50 AM Presentations

Noting the SQL Injection Carried on Web Applications Using Kali - Forensic Analysis

Presenter: Vamshi Krishna Gudipati

Room: AR-154

Abstract: Technology has improved drastically over the past few years and computers have certainly brought a great impact on our lifestyle. The computer applications and their usage over the web are myriad. It is quite evident that the in the near future, the usage of computers would relatively be higher than what we are witnessing today. A wide variety of data such as credit information, military data, human communication data, and countless types of data is shared over the far-flung computer networks. As the usage and reliability on computers increases, the thread to sensitive data likewise increases. The challenges with the cyber security when dealing with sensitive information is now a nightmare. To help understand the threats and the severity of exploits deployed, the paper provides proof of concepts for exploits carried out to compromise web applications and how the databases are exploited using the SQL injection methodologies. The SQL vulnerabilities in the web applications are surprisingly very vast and this is definitely is huge security threat to the personal data of people that is stored on web. In this paper, the methods used in information gathering, how the security is breached, and how payloads are used to exploit web applications are explained using the Kali Linux. In addition, an analysis is carried out on how the website is comprised. Methods on how to defend SQL injections are briefly justified. For the readers to understand better, a real time scenario of a penetration tester and a database server is set up with a few suppositions, and the commands that dodge the security characteristics and manipulate the databases are explicated.

Bio: Vamshi Krishna Gudipati is a computer science graduate student (class of 2015) in the School of Engineering, University of Bridgeport, Connecticut. Vamshi Krishna Gudipati is an active security researcher. His fields of interest includes computer and network security, exploit research, wireless security, computer forensics, and cryptography.

Vamshi Krishna Gudipati received his BE in Computer Science and Engineering from Kakatiya University, Warangal, India in 2014. Vamshi has given many award winning presentations in many conferences on topics like Advance Database Exploitation Techniques, Data and Information Security, Flaws in Enigma, Prevention of DDoS, Session Hijacking on Android Phones, Anti XSS forms etc. Vamshi worked as a Freelancer security researcher and got enlisted in a number of websites for finding vulnerabilities. Vamshi also helped the Cybercrime Hyderabad Police in solving numerous cybercrime cases in Andhra Pradesh, India.

Keeping Personal Data Out Of Hackers' Hands

Presenter: Scott N. Schober

Room: AR-148

Abstract: Scott discusses the leading causes of things like identity theft, ransomware and credit fraud and how all attendees can take immediate steps to secure their digital profile.

By providing the latest statistics, audience participation and his own experiences of being hacked, Scott effectively communicates the urgency for concepts like strong passwords, regular backups and reverse social engineering in order to combat the latest hacking threats out there. Scott also provides a look into the future of hacks through the eyes of a wireless expert by discussing MITM (Man In The Middle) attacks and breaches perpetrated on private citizens, government institutions and major corporations such as Target, Sony and Apple.

Bio: Scott N. Schober is the President and CEO of Berkeley Varitronics Systems (BVS), a 40-year-old New Jersey-based privately held company and leading provider of advanced, world-class wireless test and security solutions. Scott is a highly sought after subject expert on the topic of Cybersecurity and wireless technology and often seen on ABC News, Bloomberg TV, Al Jazeera America, CBS This Morning News, CCTV America, CNBC, CNN, Fox Business, Fox News, Good Morning America, Inside Edition, MSNBC and many more. Scott educates businesses around the world on how to prepare for a future of Cybersecurity and corporate espionage by sharing his experiences and insights on ransomware, passwords, drone security issues, wireless threat detection, credit fraud as well as his own experiences being the target of hackers. He has spoken at ShowMeCon, GovSec, Counter Terror expo, ISS Americas, Espionage Research International, Connected World, ConstrucTech, IEEE, GSM World Congress and many more events. He is also a guest-blogger on TripWire's State of Security and also writes for HP's Business Value Exchange. In Hacked Again, Scott's first book available now, he describes the reality of cyber threats and provide tips and techniques that will help protect you and your business interests from a devastating cyber security breach.

Models and Strategies for Effective Cybersecurity Spending

Presenter: Bill Agresti

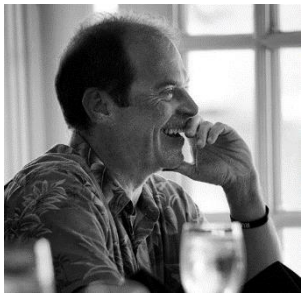
Room: AR-144

Abstract: We will discuss models and approaches for organizations to use as they spend money to improve their cybersecurity profile. We intentionally use simple expressions like 'spending money' to avoid more loaded terms so we can discuss questions such as whether that spending is considered an expense or an investment, and does it matter. And if that spending is to 'improve' an organization's cybersecurity, doesn't this imply that it can 'measure' cybersecurity? If so, how? We discuss these questions as they relate to various approaches and guidelines for organizations to use in planning and making decisions about their security spending.

Bio: Bill Agresti is a Professor in the Carey Business School at Johns Hopkins University. He is also on the faculty of the JHU Information Security Institute of the Whiting School of Engineering. His research and professional interests are in software engineering, discovery informatics, and cybersecurity. He held senior technical and management positions at Computer Sciences Corporation, MITRE Corporation, and Noblis, Inc., where he was Director of the Software Engineering and Economic Analysis Center. He was Program Director for Experimental Software Systems Research at the National Science Foundation and led applied research and spacecraft systems development projects at NASA Goddard Space Flight Center. He has a Ph.D. in Computer Science from New York University and is a Certified Information Security Manager (CISM).

10:00 AM – 10:50 AM Presentations

Building Realtime Web Apps with Angular and Meteor



Presenter: Michael Redlich

Room: AR-154

Abstract: The teams at Meteor and Angular have teamed up to create a library to tap into the power of both frameworks and their eco-systems to write quality applications in a fraction of the time. You can use libraries, packages, and solutions from both communities.

Combining the simplicity and power of Angular and Meteor brings the responsive power of Angular to the powerful and flexible Meteor stack. You can then deploy wherever you want. Angular-Meteor is completely Open Source.

This talk will provide a brief overview of the Angular-Meteor initiative and demonstrate how to build a small web application in real time.

Bio: Michael Redlich is currently a Senior Research Technician at a petrochemical research organization in Clinton, New Jersey with experience in developing custom scientific laboratory and web applications. He also has experience as a Technical Support Engineer at Ai-Logix, Inc. (now AudioCodes) where he provided technical support and developed telephony applications for customers.

Mike has been a member of the Amateur Computer Group of New Jersey (ACGNJ) since 1996 and currently serves on the Board of Directors as President. He has also been facilitating the ACGNJ Java Users Group since 2001.

Mike's technical expertise includes object-oriented design and analysis, relational database design and development, computer security, C/C++, Java, and other programming/scripting languages. His latest passions include Meteor and MongoDB.

Mike has co-authored nine (9) articles with Barry Burd for Java Boutique (now jGuru) and has presented at venues such as Emerging Technologies for the Enterprise (ETE), Trenton Computer Festival (TCF), TCF IT Professional Conference, Capital District Java Developers Network, and Princeton Java Users Group. Mike is also currently serving on the steering committees of ETE 2016 and TCF 2016.

Mike is a member of Toastmasters International and is also involved in volunteer efforts such as United Way of Hunterdon County and his company's local Science Ambassador program. He is also an avid runner as a member of the Hill Runners of Hunterdon and has completed numerous marathons.

Mike holds a Bachelor of Science in Computer Science from Rutgers University.

Hosting: A comparison of leased servers, cloud hosting and IaaS, with a focus on Amazon Web Services

Presenter: Steve Saporta

Room: AR-148

Abstract: Options for web application hosting are available that we never dreamed of in the days before cloud computing. After an overview of the differences among traditional leased servers, cloud hosting and infrastructureasaservice, we'll take a deeper dive into the offerings of Amazon Web Services. The presentation will draw on realworld examples from a local software firm that uses more than half a dozen of Amazon's services. This is a great session for those with a less technical background who want an overview of the hosting landscape, as well as for software engineering students and professionals whose formal training hasn't focused on realworldhosting and deployment of software. Participants will learn about:

- Why hosting is important.
- Pros and cons of shared, dedicated, cloud and IaaS hosting.
- Amazon Web Services (AWS) and its competitors.
- Details of AWS's EC2, S3 and other cloud hosting services.
- How to optimize performance and cost of an AWS hosting environment.

NOTE: This topic was first presented to a software engineering class at Southern Connecticut State University. Although the presentation will be modified somewhat for ITPC, the original slide deck is available here to provide more detail about the material:

https://drive.google.com/file/d/0B3M_r2KMl_NKYl96N1B3WmxwZE0/view?usp=sharing

Bio: Steve Saporta is a technology executive with a wide range of experience in all aspects of software engineering and business. Hired as the third employee of Midi, Inc., he served as a programmer, technology manager and CTO during the company's growth to more than 40 employees, acquisition by a team of investors, and merger with the publicly traded company SAI Global. Steve then became CTO of LocalUp Solutions (recently acquired by Groupon), where he built and led the team that developed and supported Ecommerce software serving more than 500,000 customers. His next position was as the CTO of Joule Assets, a startup in the energy industry. Steve currently serves as Chief Technology Officer of SpinCar, a New York Citybased startup that produces interactive, photorealistic 360degree walkarounds for automotive clients.

In addition to presenting The Cost of the Cloud at ITPC 2015, he has recently appeared as a panelist at the Rutgers Career Exploration and Networking Series: Computer Science & IT, and as a guest speaker to a software engineering classes at Penn State and Southern Connecticut State University.

A graduate of Princeton University in Computer Science, Steve enjoys skiing and playing guitar and bass.

BDD and Continuous Testing in DevOps Era

Presenter: Rajkumar J. Bhojan

Room: AR-144

Abstract: As we are entering a new era of digital transformation, software organizations across industry sectors are challenged to adopt DevOps with Continuous Testing in digital technologies. In response to increased demand, IT organizations are seeking new ways to accelerate their release cycles-driving the adoption of agile or lean development practices such as DevOps. In DevOps, Automation is essential to create processes that are iterative, frequent, repeatable, and reliable, so the organization must create a delivery pipeline that allows for continuous, automated deployment and testing. Those who neglect testing will struggle to keep up in a world filled with app stores, social media and increased user expectations.

This talk mainly focuses on

- How BDD (Behavior Driven Development) framework will help in accelerating Continuous Testing (CT) in DevOps environments.
- Demonstrating an effective strategy for continuous testing in mobile application development.
- Demonstrating an Automated Test Environment using BDD framework and Continuous Integration.
- Motivating the participants to learn more about DevOps, CI, Agile Testing, Mobility Testing, Continuous Testing and Test Automation ROI in DevOPs platforms

Bio: Rajkumar J. Bhojan is working as a Principal Consultant at Wipro Technologies, Boston, USA. He has over two decades of professional experience in both IT and Academics. He is holding M.Sc., (Phy), MCA, M.Phil (CS) and currently he is pursuing Ph.D. in Computer Science. He has executed IT projects in diverse geographies including India, Australia, China & USA. He has worked as a QA Manager, Corporate Trainer, Lead Architect and Consultant in reputed organizations. He has presented and published many technical papers at International conference, International journals and IEEE forums. He is a Certified Scrum Master (CSM) and has rich experience in Agile/scrum Methodologies. He has also conducted many full day training programs on Testing Tools/Agile/Scrum/ATDD&BDD and hundreds of software engineers got benefited through his trainings. He conducts frequent Cross-connect (VCon) sessions and webinars on Cloud based Test Automation, Mobile Testing and Scrum/Agile Testing. His research interests include software engineering, IoT, Data Analytics, Mobile computing, AI and DevOps. He is a member in IEEE, ACM and Scrum Alliance.

11:00 AM – 11:50 AM Presentations

High-Performance Web-Enabled Systems - An asynchronous, reactive, and data-driven, approach

Presenters: Enzo Alda and Monica Figuera

Room: AR-154

Abstract: The world is experiencing an exponential growth in the amount of generated data. The number of phones, computers, and other devices connected to the cloud keeps increasing, as businesses and consumers demand continuously updated services. Therefore, requirements for the processing and consumption of real-time data are getting ever more stringent. Meanwhile, Web-enabled systems are the norm, even though traditional Web protocols are clearly ill suited for a real-time world, and even relatively modern Web technologies are showing their limitations. Fortunately, recent advances, as well as coming ones, enable us to build elegant Web-enabled solutions that can keep up with high data rates. This presentation will cover conceptual and practical aspects in the design and development of real-time websites, discussing "technology stack" trade-offs that entrepreneurs, as well as managers and CTOs, are likely to face. It will include a live demonstration of a Web-enabled system that handles thousands of updates per second while staying responsive to user input, allowing fluid navigation.

Bio: Enzo Alda is the principal and founder of Lakebolt Research, a Connecticut technology incubator focused on quantitative data analysis. Prior to founding Lakebolt Research, Mr. Alda worked at Google (Google Spreadsheets), and Bloomberg LP, where he conceived and implemented the engine that powers real-time calculations in the Bloomberg terminal. Before coming to the United States, Mr. Alda was lecturing courses in compiler construction and programming language design. He holds B.S. and M.S. degrees in Software Engineering and Computer Science respectively, as well as an MBA from The Wharton School of Business. Mr. Alda joined the IEEE in 1999.

Bio: Monica Figuera is a Software Engineering candidate at University Simón Bolívar (Venezuela) specializing in the areas of Web Technologies and Distributed Databases. Ms. Figuera's research focuses on rule-based rendering and navigation of frequently updated distributed databases that support nested data structures described by post-relational schemas.

Background and Performance of Hadoop

Presenter: Hamoud Alshammari

Room: AR-148

Abstract: In this presentation we will review the background and performance of Hadoop. We first introduce the general background of Hadoop and its three major components, which are Hadoop Distributed File System, MapReduce, and Hadoop ecosystem. Then we will review Hadoop performance and discuss how that performance can be improved. We will discuss different components in Hadoop that researchers have developed to improve Hadoop performance, such as Hadoop Data Locality, MapReduce Job Scheduling, and Improving Hadoop for specific data types. For each developed area we introduce a general background, discuss the technical limitations, and review the latest updates on those areas. This discussion aims to provide a complete overview for researchers interested in this field. We will conclude with a discussion about the main objectives of

Hadoop, which can be used in further discussion and development of new improvements in Hadoop performance.

Bio: Hamoud Alshammari received a BS in Computer Information Systems from King Saud University, Saudi Arabia in 2002. He received his first MS degree in Business MBA from Yarmok University, Jordan. He has many years of work experience in Saudi Electricity Company in data administrating and analyzing. Then, he moved to the United States and finished the second MS degree in Computer Science from University of Bridgeport, CT-USA. He is doing his Ph.D. in Computer Science and Engineering at University of Bridgeport, CT-USA. Alshammari is doing his research in BigData and Hadoop MapReduce performance. He is also has interesting in data analysis. Mr. Alshammari is a member in Upsilon Pi Epsilon Honor Society.

Opportunities in Cybersecurity

Presenter: Denise Pheils and Jane LeClair

Room: AR-144

Abstract: This session will introduce the opportunities that exist in one of the fastest growing job segments: cybersecurity. The need for well-trained cybersecurity workers is urgent to meet the need of the many jobs that are unfilled and the demand that has outpaced the ability of colleges to graduate educated and competent cybersecurity professionals. The shortage of qualified workers offers an opportunity for traditionally underserved populations including women. This presentation will include a brief graphical overview of the issues, a spirited discussion and take ways to promote cybersecurity careers and offer resources and encouragement to women looking to enter the field.

Bio: Dr. Jane LeClair is the chief operating officer for the National Cybersecurity Institute at Excelsior College in Washington, DC. Previously, she served as dean of the school of Business and Technology at Excelsior College in Albany, NY. She is a vocal advocate for attracting and retaining more women in the technology fields and established the Dr. Jane A. LeClair Scholarship Fund for Women in Technology at Excelsior College in 2012.

Bio: Dr. Denise Pheils is a professor in cybersecurity and has taught from the associate to doctoral levels. She is a fellow of the National Cybersecurity Institute and holds 21 certifications including the CISSP and PMP.

1:40 PM – 2:30 PM Presentations

Architecture in an Agile World

Presenter: Dennis Mancl

Room: AR-154

Abstract: Agile development is becoming more popular -- building software using in small teams, adding new features in short iterations, and spending less effort on up-front requirements and design documentation. Agile principles say that we should avoid doing "big up-front design", but we can't take this to an extreme. Some basic architecture and design planning are necessary: to find hidden requirements, to identify key security and performance scenarios, and to structure the work of developers. This presentation will discuss the balance between agility and plan-driven development approaches -- to show how the two can work together.

Bio: Dennis Mancl is a New Jersey-based software process and software design expert. He worked as a Distinguished Member of Technical Staff at Alcatel-Lucent, where he has been involved in object oriented designs, design patterns, software architecture, and agile development practices for over 20 years. Dennis has M.S. and Ph.D. degrees in computer science from University of Illinois. In his spare time, Dennis is an amateur musician: he enjoys everything from Bach to Basie, and he plays oboe, clarinet, and saxophone.

Software as a Service (SaaS)

Presenter: Fredrick Dande

Room: AR-148

Abstract: Software as a Service (SaaS) delivery will significantly outpace traditional software product delivery, growing nearly five times faster than the traditional software market and becoming a significant growth driver to all functional software markets, projections are that the SaaS market will surpass $100 billion by 2019 (IDC). The simplicity of SaaS adoption with a consumption model similar to the way utility companies deliver water, electricity or gas service has enabled companies to sign agreements allowing them to pay for software only when they use it as opposed to earlier enterprise software contracts when initial capital invested did not justify the benefits.

Per NIST, SaaS, provides capability to the consumer to use the provider's applications running on a cloud infrastructure. The applications are accessible from various client devices through a thin client interface such as a Web browser (e.g., Web-based email like gmail).

Consumer does not manage or control the underlying cloud infrastructure including network, servers, operating systems, storage, or even individual application capabilities, with the possible exception of limited user-specific application configuration settings.

The presentation will introduce the audience to Cloud Computing and elaborate on the SaaS model. A detailed review of the current state of SaaS will provide the audience with a comprehensive understanding of the driving force justifying the accelerated growth of SaaS across several industries.

Major challenges that face the SaaS cloud computing model including data migration, SaaS security, cloud standards, and back end integration capability of different SaaS applications that affect SaaS adoption in some industry will also be presented. Finally, the presentation will highlight major SaaS vendors and examples of SaaS offerings.

Bio: Fredrick Dande is an IT manager for a financial services company in the Philadelphia region. He is responsible for strategic objectives such as developing and implementing enterprise infrastructure policies and procedures, tracking and driving departmental goals, monitoring and reporting of departmental progress, establishing a quality focused service culture, and managing Information Technology infrastructure. He has over 10 years experience in IT within the financial services Industry.

Fredrick is certified Project Management Professional (PMP) and a member of the Project Management Institute. He is a former Board of Directors of the Junior Achievement of New Jersey.

Fredrick earned his bachelor's degree in Engineering Technology, a Masters degree in Management of Technology both from New Jersey Institute of Technology and later his MBA from University of Massachusetts's Isenberg School of Management. He is currently pursuing a Doctorate degree in Management of Technology at Indiana State University with a specialization in Digital communication.

Architecting and Evaluating Discrete Integration Services in the Advancements of Digital Technologies of an Enterprise

Presenter: Vikas S. Shah

Room: AR-144

Abstract: Fabricating on transaction cost economics and the knowledge-based theory of an enterprise, digital technologies are competence-destroying to organizations' integration strategy. Enterprises that are integrated vertically into the digital technologies will perform better than those that are not. Boundaries of an enterprise, whether it is a startup or large scale business-to-business (B2B), are dynamic in the arsenal of upcoming digital economy. Architecting discrete integration services of many real-life systems and their interdependencies are always challenged with how the dynamicity of business scenarios and digital technology advancements are handled and incorporated in an enterprise.

We provide an analysis of the challenges and open research questions that must be addressed to achieve goals of a digital enterprise in the perception of integration considering upcoming technology dilemmas such as Cloud computing, Internet-of-Things (IoT), API management, Mobility, and Big Data. Enriching digitization with discrete integration services provides more efficient way of enabling progression of an enterprise to keep pace with advancements in digital technologies. We utilized explicit case studies pertaining to diversified industry verticals to illustrate as well as methodology to evaluate the magnitudes.

Bio: Vikas S. Shah received M.Sc. degree in computer science from Worcester Polytechnic Institute, MA, USA in 1998 and Bachelor of Engineering in Computer Engineering from Conceicao rodrigues college of engineering, University of Mumbai, India. Currently, he is Chief Architect in Connected Enterprise Services (CES) group at Wipro Technologies, NJ, USA. He has published 15+ papers in integration

architecture, real-time enterprises, architecture methodologies, and management approaches. He headed multiple enterprise architecture initiatives and research ranging from startups, global organization, to consulting firms. Besides software architecture research and initiatives, he is extensively supporting pre-sales solutions, risk management methodologies, cloud strategy assessment, IoT implementation, and Big Data product selection.

2:40 PM – 3:30 PM Presentations

An Algorithmic Solution for the "Hair Ball" Problem in Data Visualization

Presenter: Khalid H. Alnafisah

Room: AR-154

Abstract: The investigation and analysis of large and complex graphs is an important aspect of data visualization research, yet there is a need for entirely new, scalable approaches and methodologies for graph visualization. This can ultimately provide more insight into the structure and function of this complex graph. To explain more, we to need find a methodology to develop a solution to present a "tidy" graph with the minimal crossover between edges in the "Hair Balls." In spite of the expanding significance of investigating and extensively analyzing and understanding very large graphs of data, the traditional way of visualizing graphs has difficulties scaling up, and typically ends up depicting these large graphs as "Hair Balls". This traditional approach does indeed have a deeply intuitive foundation: nodes are depicted with a shape such as a circle, triangle or square, which are then connected by lines or curves that represent the edges. In any case, although there are many different ways to apply this basic underlying idea, it needs to be revisited in light of current and emerging needs for understanding increasingly complex crossover between edges in the graphs. The complex "Hair Ball," which appears as an indecipherable graph, came from the crossover between edges. From our preliminary research, we found the major disadvantage in the Hair Balls graph was that it confused observers. Users may think there are some extra nodes; but in reality, there are not. Because there are many crossovers between edges in the Hair Balls, the impression also may affect observers' understanding of the whole structure of the graph. Major problem-no effective reception of information from a "Hair Balls" graph-meaningless to observers.

Bio: Khalid H. Alnafisah is completing a Master of Science degree in Computer and Information Science from Gannon University, PA, with Expected Graduation May 2016. He currently holds a Bachelor of Science degree in Computer Science from Grambling State University, LA, and High diploma in Communication and Computer Networks from the Kingdom of Saudi Arabia (2006). He has some publications including 4 patents from the U.S.A patent office.

Big Data Market Research, in Today's Economy

Presenter: Donald Hsu, PhD.

Room: AR-148

Abstract: Big Data is hot these days. There are two aspects, one is technical, and one is business side. For technical skills, you need to verse in Database, Data Mining, SQL server, Hadoop, MapReduce, Hive and many other new buzzwords. Learning each of them takes weeks, if not month. On the business side, there are thousands of jobs in Data, Analyst, and Marketing using Big Data.

This talk deals with the collection, evaluation, and analysis of the big data market-related information. Topics are: market research industry, problem definition, research process, focus group, secondary database, quantitative research, questionnaire design, sampling techniques, statistical modeling, bivariate and multivariate correlation, communicating results and management reports. Using SPSS software, you will learn to perform detailed data analysis. You can work as a market researcher, data analyst, and similar titles.

The speaker will demonstrate real-life IBM SPSS projects.

Bio: Donald Hsu, PhD., Professor Dominican College and President Chinese American Scholars Association (CASA). He trained/taught 70 subjects - Accounting to Unix 11,000+ clients/students. Clients/students work at AT&T, Bank America, Ford, Goldman Sachs, IBM, JPMChase, Mercedes Benz, Microsoft, Morgan Stanley, Siemens, Sony, Toyota, Volvo, and Verizon. CASA ran 19 successful E-Leader conferences in Asia and Europe, http://www.g-casa.com. He traveled to 79 countries in Africa, Asia, and Europe for international business. Don's profile is here, with 6,100+ partners/clients on Linkedin, http://www.linkedin.com/pub/donald-hsu/0/15/A14.

FIRST Robotics: The Farm Team for Tech

Presenter: Joe Levy

Room: AR-144

Abstract: FIRST program alumni will be an asset in any technical organization. Watch for them!

FIRST Robotics is a whole lot more than the robot games you see on videos. The videos don't show the education that these young people gain on their way to the competitions. The real story is how FIRST is growing the next generation of creative problem-solvers and start-up entrepreneurs.

In this talk, you will see that FIRST participants are really running small tech enterprises, with all that implies. They are developing all of the professional skills not often taught in college. Hire a young person with FIRST on his or her resume, and you're getting a true young professional.

Bio: Joe Levy is a Management Consultant, I.T. Project Manager, and Business Analyst. He has extensive experience as liaison between core competency business units and the engineering and I.T. resources

that support their operation. He has served as a volunteer judge at a variety of recent FIRST competitions.

2:40 PM – 3:30 PM Presentations

Automated Surveillance System for Oil/Gas Pipeline Infrastructure Protection

Presenter: Dr. Vijayan K. Asari

Room: AR-154

Abstract: Research in autonomous detection of machinery threats on oil and gas pipeline right-of-ways (ROWs) in wide area imagery is an important task to protect our pipeline infrastructure. A great amount of effort is required for human analysts to identify threats manually in thousands of images captured by small aircrafts or Unmanned Aerial Vehicles (UAVs). Therefore, there is a need to develop a full-fledged system to automate this process. We present the development of an automatic threat detection system that can detect potential threat objects on pipeline ROWs to aid the human analysts for threat evaluation and subsequent actions. In order to provide robust monitoring of threats or intrusions to pipeline ROWs, the technology should be capable of addressing the challenges due to image resolution, sensor noise, lighting conditions, partial occlusions, and various heights and viewing angles between the objects and sensors. Our real-time automated airborne monitoring system can detect, recognize, and locate machinery threats such as construction equipment entering the pipeline ROWs. The detection results are provided in real-time through the use of a Graphical User Interface (GUI) to inform the pilot if any threat is detected. It also provides more detailed threat information, such as the distance between the threat object to the pipeline and threat activation data. Additionally, our system is able to spontaneously generate a Keyhole Markup Language (KML) file, which contains geo-information of the threats, for fast object localization using earth browsers such as Google Earth or Google Maps. To achieve a real-time processing performance, a Batch Updating Modular Key Frame (BUMKF) selection technique and a Graphics Processing Unit (GPU) based hardware acceleration methodology are integrated within the system. A pyramidal Fourier histogram feature extraction technique is employed for determining the characteristics of various construction vehicles, and a cascaded object classifier approach is introduced to detect threat objects on the pipeline ROW. Experimental results using several real-world datasets demonstrate that the proposed system is capable to detect and recognize objects in many challenging environmental conditions such as low illumination, varying image resolution, partial occlusion, and various object orientations. The test results also show that our system can reach a real-time processing speed of approximately 3 frames per second with good accuracy which offers a new and useful automated tool for persistent surveillance of oil/gas pipelines. Currently, we are deploying our system on a UAV for testing, and developing an automated communication system to send signals such as the detected threat object information from the aircraft/UAV to the ground station in real-time.

Bio: Dr. Vijayan Asari is a Professor in Electrical and Computer Engineering and Ohio Research Scholars Endowed Chair in Wide Area Surveillance at the University of Dayton, Dayton, Ohio, USA. He is the director of the Center of Excellence for Computer Vision and Wide Area Surveillance Research (Vision Lab) at UD. Dr Asari received his BS in electronics and communication engineering from the University

of Kerala (College of Engineering, Trivandrum), India in 1978, M Tech and PhD degrees in Electrical Engineering from the Indian Institute of Technology, Madras in 1984 and 1994 respectively. Prior to joining UD in February 2010, Dr Asari worked as Professor in Electrical and Computer Engineering at Old Dominion University, Norfolk, Virginia for 10 years. Dr Asari worked at National University of Singapore during 1996-98 and led a research team for the development of a vision-guided microrobotic endoscopy system. He also worked at Nanyang Technological University, Singapore during 1998-2000 and led the computer vision and image processing related research activities in the Center for High Performance Embedded Systems at NTU. Dr Asari holds three patents and has published more than 500 research papers, including an edited book in wide area surveillance and 84 peer-reviewed journal papers in the areas of image processing, pattern recognition, machine learning and high performance embedded systems. Dr Asari has supervised 22 PhD dissertations and 35 MS theses, and currently several graduate students are working with him in different sponsored research projects. He received several teaching, research, advising and technical leadership awards. Dr. Asari has been a Senior Member of the IEEE since 2001 and is a Senior Member of the Society of Photo-Optical Instrumentation Engineers (SPIE). He is a member of the IEEE Computational Intelligence Society (CIS), IEEE CIS Intelligent Systems Applications Technical Committee, IEEE Systems, Man and Cybernetics Society (SMC) Technical Committee of Human Perception in Vision, Graphics and Multimedia, IEEE Internet of Things (IoT) Community, Society for Imaging Science and Technology (IS&T), IS&T Data Analytics and Marketing Task Force, Institute for Systems and Technologies of Information, Control and Communication (INSTICC), and American Society for Engineering Education (ASEE). He is the co-organizer of several SPIE and IEEE conferences and workshops. Dr Asari is actively participating in several federal and private funded research projects and he has so far managed around $15M research funding. As leaders in innovation and algorithm development, UD Vision Lab specializes in object detection, recognition and tracking in wide area surveillance imagery captured by visible, infrared, thermal, LiDAR (Light Detection and Ranging), and SAR (Synthetic Aperture Radar) sensors. Dr Asari's research activities also include development of novel algorithms for 3D scene creation and visualization from 2D video streams, automatic visibility improvement of images captured in various weather conditions, human identification, human action and activity recognition, and brain signal analysis for emotion recognition and brain machine interface. Homepage: http://sites.udayton.edu/vasari1/

Applying Machine Learning Techniques to Improve Quality

Presenter: Richard F. Eng

Room: AR-148

Abstract: Continuous process improvement remains an imperative across all industry sectors and organizations. Advances in algorithms, computing capacity, and machine learning tools make it possible for quality professionals to leverage historical quality attribute data to gain insights into what can be done to improve quality. The case study presents current research applying machine learning techniques to software quality and project attributes to predict project success, forecast project costs and project duration. Many organizations are interested in improving software quality on complex software acquisition projects. Poor software quality is one factor that effects project success, cost, and schedule. Organizations have invested in static source code analysis and subject matter expert analysis of source code to gauge the quality of the source code delivered. The

software quality assessment results (attributes) are typically compared to a corpus of industry and/or organizational assessment results. The research effort investigates whether machine learning techniques can leverage software quality and project attribute data to predict project success and forecast project cost and project duration. If successful, the predictive models may provide insight into which software quality and project attributes have the greatest influence over project success/failure, cost, and schedule. Using multiple alternative predictive models would enable the organization to check their results and make better investment decisions. For example, the models might indicate that the effort required to improve current software quality is too great and that it might be better to cancel the project and start over again. In other cases, the models could provide insight into key attributes that provide the best return on investment for achieving complex software acquisition project success, target cost, and target schedule. The use case illustrates the application of machine learning to improve software project quality and decisions. However, the analytics process and machine learning techniques can be applied to manufacturing, services, government, health care, and other sectors.

Bio: Richard F. Eng is the Associate Department Head of Applied Software Engineering at the MITRE Corporation. He is an adjunct professor of the Computer Science and Software Engineering at Monmouth University. He has over 25 years of industry experience in telecommunications and software systems. His areas of interest are quantitative methods to improve business, IT processes, and software quality. Richard is an ASQ Certified Software Quality Engineer, Reliability Engineer, and Quality Engineer. He is a certified Projects in Controlled Environments (PRINCE2) Practitioner and a PMP. Richard graduated from Georgetown University with an MBA. He graduated from Brooklyn Polytechnic Institute with a M.S. in Bioengineering and B.S. in Chemistry. Richard earned a M.S. in Data Analytics from the University of Maryland.

Industry, Academia, and Entrepreneurship: Insights from Riding the Metaphorical 3D See-saw

Presenter: Nikhil Yadav

Room: AR-144

Abstract: Opportunities in computer science and engineering have hit a crescendo with the ability to pursue careers in three broad dimensions: working for established and emerging IT companies (industry); research and teaching (academia); establishing technology startups (entrepreneurship). Making a decision as to which dimension to pursue involves dilemma resolution using the practical application of reason and revelation. If applied properly, the decision making process can help in maintaining a healthy work-life balance in the long-run. Through my personal experiences as a rider on all three planks of this metaphorical 3D see-saw (as a college student, software engineering professional, doctoral researcher, startup co-founder, to my current role as a computer science assistant professor), I highlight challenges and resolutions in this decision making process. I present how I transitioned between industry and academia and also explain how my research on using speech biomarkers for detecting mild traumatic head injuries (mTBI) while I was a doctoral student led to the formation of a startup company. Finally, I present algorithms which can help in resolving internal conflicts and make an informed decision as to which side of the metaphorical 3D see-saw to sit on as an IT professional.

Bio: Nikhil Yadav is an Assistant Professor in the Division of Computer Science, Mathematics, and Science at St. John's University in Jamaica, New York, where he has been a faculty member since 2015. He completed his Ph.D. in Computer Science and Engineering at the University of Notre Dame, and his M.S. in Computer Engineering at the University of Florida. His research interests lie in the area of mobile computing and data mining, with a focus on their application in developing healthcare technologies. He co-founded Contect Inc., a startup which was based on his doctoral research to find a correlation between speech and mild traumatic brain injuries while he was a Ph.D. student at Notre Dame. He enjoys dabbling in entrepreneurial pursuits and brainstorming on startup ideas with enthusiastic peers. Nikhil is currently an instructor for undergraduate courses in data structures, data mining, and database management systems; he also instructs graduate courses in data mining and predictive analytics at St. John's University in New York.