2021 IEEE/ACM TCF Information Technology Professional Conference (TCF-ITPC)

Program Book

Date: Friday, March 19, 2021 to Saturday, March 20, 2021
Time: 8:30AM to 5:00PM
Location: Virtual via Zoom

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 **2021 15th 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 may be found in this program book and posted on our website.

Our conference presentations are scheduled to at **begin 9:00 AM to 5:00 PM** on **Friday, March 19, 2021** with **extended sessions at 10:15 AM to 5:00 PM** on **Saturday, March 20, 2019** combined with the Trenton Computer Festival.

Registration:

In-person registration will not be required this year as this conference is virtual and free of charge.

Presentations:

All *Friday* presentations will be presented via individual Zoom links posted on the ITPC website and shown here:

- Track 1 – Applications Development
- Track 2 – Security/Technical

All *Saturday* presentations will also be presented via a dedicated Zoom link accessed through the portal at the TCF website. Each presentation is 50-55 minutes and the audience should be a diverse mix of practicing professionals, educators, interested engineers and students.

Facilitated Networking Session:

As has been tradition in the past, there will be a facilitated networking session for all the speakers and attendees introduce themselves. The only thing missing this year is the lunch and the door prizes. This should return in 2022. This session will be held from **12:00 PM to 1:30 PM** using the **Track 1** **Zoom link**.

TCF Keynote:

The TCF keynote speaker will be Jerry Foster, CTO and co-founder at Plex Systems, who will be presenting "How I Learned to stop Worrying and Love Artificial Intelligence."

Posted Presentations:

Some of the presentations may be posted on the TCF ITPC website.

TCF:

The **45ᵗʰ Annual Trenton Computer Festival** will be held at The College of New Jersey, Ewing Township, NJ on Saturday, March 20, 2021 between 9 am and 5 pm. This year's theme is Artificial Intelligence. The program includes over 50 panel sessions, workshops, tutorials, demonstrations, educational events and a Flea market. For more information, please visit the TCF website.

Thank you for your participation,

David Soll

Conference Chair

IEEE Information Technology Professional Conference

Presentation Schedule

	Application Development Track 1	Security/Technical Track 2	
	Friday, March 19, 2021 Information Technology Professional Conference		
8:00 AM	R E G I S T R A T I O N		
9:00 AM	Building Robust Applications with the MicroProfile APIs: A Live Coding Event By Michael Redlich	Security Privacy Emerging Technologies By Larry Copeland, Jr.	
10:00 AM	Self-Programming Artificial Intelligence By Kory Becker	Privacy Law Update By Fred Wilf	
11:00 AM	Joining an Established Agile Team By Michael Sava	Towards Wide-Spectrum Computing By Enzo Alda & Javier Lopez	
12:00 PM	F A C I L I T A T E D N E T W O R K I N G S E S S I O N		
1:30 PM	Building Layers of Defense for your Application using Spring Security By Neha Sardana	Bitcoin, Blockchain, Cryptocurrency better than Gold? By Donald Hsu	
2:30 PM	Developing for Big Data at the Intersection of Containerizations and Infrastructure as Code By Howard Deiner	Cybersecurity Issue Regarding Technology Advancements in Social Welfare By Donna Schaeffer	
3:30 PM	Servant Leadership in a Distributed and Disruptive World By Greg Tutunjian	Case Study: DevSecOps Prototype to Automate Security Control Assessments By Ricky Eng	

9:00 AM Sessions

Building Robust Applications with the MicroProfile APIs: A Live Coding Event

By Michael Redlich
Track 1 – Applications Development

The MicroProfile initiative, introduced in mid-2016, is a collaboration of Java community members representing IBM, Red Hat, Tomitribe and Payara, among others.

The initial three MicroProfile APIs: Contexts and Dependency Injection (CDI); Java API for JSON Processing (JSON-P); and Java API for RESTful Web Services (JAX-RS), have been considered a minimal set of APIs for building microservices-based applications. Since its debut, MicroProfile has grown to a total of 12 core APIs along with three standalone APIs for handling reactive streams.

This presentation will provide an introduction and overview of MicroProfile followed by a live coding session to demonstrate some individual MicroProfile APIs.

About Michael Redlich:

Michael Redlich is a Senior Research Technician at ExxonMobil Research & Engineering in Clinton, New Jersey (views are his own) 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's technical expertise includes object-oriented design and analysis, relational database design and development, computer security, C/C++, Java, Python, Matlab and other programming/scripting languages. His latest passions include MicroProfile, Jakarta EE, Helidon, Micronaut and MongoDB.

Mike has been an active member within the Java community for the past 20 years. He founded the Garden State Java User Group (formerly the ACGNJ Java Users Group) in 2001 that remains in continuous operation. Since 2016, Mike serves as a Java community news editor for InfoQ where his contributions include monthly news items, technical writing and technical reviews. Mike has co-authored nine (9) articles with Barry Burd for Java Boutique (now jGuru). He has presented at venues such as Oracle Code One, Emerging Technologies for the Enterprise (ETE), Trenton Computer Festival (TCF), TCF IT Professional Conference, Philly Java Users Group, Princeton Java Users Group and Capital District Java Developers Network. More recently, Mike has contributed to open source projects and participates on the leadership council of the Jakarta EE Ambassadors.

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

Security Privacy Emerging Technologies

By Larry Copeland, Jr.
Track 2 – Security/Technical

Information technology continues to grow while adapting to the changes, whether in business or computing. The new security insights that come from these changes are what will make up technology for 2021 and beyond. The Business Sector's use of technology was initially designed for the ability of the business to operate and provide services with security as an afterthought to the developed solution. Today the possibilities that exist on the Internet could not be imagined at the time of inception. As we enter into the year 2021, the start of a new decade, emerging technologies are on the horizon that has the potential to slingshot Information Technology by leaps and bounds.

The continuous growth of cybersecurity threats and attacks via malware and ransomware are impacting the public while putting users and their privacy at high risk. Providing security and privacy of emerging technologies in the business sector are key components to success. The paper seeks to display and understand emerging technologies on the horizon for 2021. In many cases, these technology trends have been in use for some time intending to work out any production issues, so a full rollout of the solution will come this year. All of the technologies discussed in this paper are designed to be stand-alone solutions. However, as mentioned in the details, it is when the emerging technologies are combined that we see the biggest and most positive impact on the security and, therefore, privacy, which could be impacted if any of the emerging technology should fail. Information technology has come a long way.

About Larry Copeland, Jr.:

Executive Managing Consultant

- Over 27 years of experience in: Information Technology (IT), Systems, Networking, End-Point protection, and Compliance with the last 10 years focused primarily on Security for large Fortune 500 organizations.
- Delivered solutions involving HIPAA Compliance, Strategic Planning, Business Continuity Planning; Security Framework; and Risk Analysis & Assessments for an array of industries including healthcare, retail, aerospace, financial and software companies.
- Past clients include international oil & gas corporation, National Insurance agency, and U.S. regulatory agencies

Professional Education & Certifications

- M.B.A, Business, Florida Institute of Technology
- MS, Information Systems Technology, Florida Institute of Technology
- CDSPE, CRISC, CISM, CISSP, GSEC-GOLD, CCSP

10:00 AM Sessions

Self-Programming Artificial Intelligence

By Kory Becker
Track 1 – Applications Development

Is it possible for a computer program to write its own programs? While this kind of idea could seem far-fetched, it may actually be closer than we think. This presentation introduces "AI Programmer", a machine learning system, which can automatically generate full software programs requiring only minimal human guidance. The system uses genetic algorithms coupled with a tightly constrained programming language. We'll cover an overview of the system design and see examples of its software-generation capabilities.

About Kory Becker:

Kory Becker is a Senior Software Developer for Bloomberg LP. With a background in artificial intelligence and machine learning, she is the author of "Building Voice-Enabled Apps with Alexa" (2017 Bleeding Edge Press). She has developed award winning software products that have been featured prominently in publications like PC Magazine, PC World, USA Today, Consumer Reports, Apple iTunes, and Google Chrome. Her research has been referenced by leading sources, including Google Brain. You can find her articles at http://www.primaryobjects.com. She is active on Twitter and on GitHub.

Privacy Law Update

By Fred Wilf

Track 2 – Security/Technical

Within the past few years, privacy law has continued to become more stringent. While US privacy law remains far less stringent than the privacy regimes of the European Union and many other countries, the gap is narrowing, and that has real-word consequences from both the technology and business standpoints. This talk will briefly discuss what has recently changed, what processes need to be implemented, and possible paths forward.

About Fred Wilf:

Fred Wilf is an attorney who practices technology and intellectual property law. He is the principal of Wilftek LLC (Wilftek.com). For more than 30 years, Fred has been representing individuals and tech companies, ranging from solo entrepreneurs to Fortune 500 companies.

His work covers information technology, chemicals, life science, electronics, and mechanical. Fred works with clients for the full life cycle of technologies, including development, protection, licensing, and transfer. He prosecutes trademark and copyright applications, but does not prepare or file patent applications. Fred works in related areas such as privacy, security, ecommerce and online agreements, and outsourcing. He arbitrates technology, intellectual property and business disputes.

Fred also writes and speaks on technology and the law, including running and speaking at continuing legal education seminars, and speaking at groups and schools. He used to update a four-volume legal treatise on computer software. Fred also volunteers with non-profits and charities.

11:00 AM Sessions

Joining an Established Agile Team

By Michael Sava
Track 1 – Applications Development

In 1965 educational psychologist Dr. Bruce Tuckman outlined the "Stages of Team Development" as: forming, storming, norming, and performing (with adjourning added in 1970). As an agile team leader (scrum master / iteration manager) or team member you may recognize these stages in your team's own journey. However, what happens if you join an already established team? What if you are the leader joining a new squad? Does the team need to progress through the stages of development again?

This session will be centered around agile, teams, best practices and my lessons learned.

About Michael Sava:

Mike Sava is currently the Technical Lead and Iteration Manager for IBM Research's Apps@Research group. A twenty plus year software engineer and application developer Mike now performs as the technical lead, setting direction for an application development team at IBM Research focusing on application development in the age of hybrid cloud and AI.

Towards Wide-Spectrum Computing

By Enzo Alda and Javier Lopez
Track 2 – Security/Technical

In September 2018, Microsoft released dynamic array formulas for MS-Excel 365 and two years later, just last December to be precise, Microsoft Research announced the addition of lambda expressions and user-defined functions. Our presentation explains the significance of these two developments and what they suggest about the future of spreadsheets: the most successful end-user computing environment for over four decades now. We make the case for the benefits of integrating advanced programming language concepts into the spreadsheet core, instead of relegating such features to extraneous programming adjuncts like VBA and AppScript. Having played a role in the confluence of spreadsheets and modern programming environments, we offer our own perspective on this quest - demonstrating live on the virtual stage how such environments are well-suited for the integration of computational thinking in K-12 curriculums and promoting a more effective collaboration between end-users and professional software developers in an industry setting.

About Enzo Alda:

Enzo Alda is the founder of Lakebolt Research, a firm focused on end-user computing. He formerly held roles at technology startups and large organizations like Oracle, Bloomberg and Google. Mr. Alda 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 degrees in Software Engineering, Computer Science and an MBA. Mr. Alda joined the IEEE in 1999.

About Javier Lopez:

Javier Lopez is the compiler design lead at Lakebolt Research. He is a software engineer graduate of University Simón Bolívar (Venezuela) where he specialized in programming language design and implementation. Mr. Lopez is proficient in OCaml, JavaScript, and many other programming languages. His main research interests are functional programming, compiler construction, and VM design.

1:30 PM Sessions

## Building Layers of Defense for your Application using Spring Security

By Neha Sardana
Track 1 – Application Development

Web applications are facing imminent threat these days with hackers trying to get into applications and stealing user data. In order to protect our applications, we need to defend ourselves by making our applications more secure. By using the Spring Security framework, we can use industry standard defense mechanisms to protect web applications from various issues. We will learn some of the basic principles of application security and then deep dive into how Spring Security Framework can help us achieve our goal.

About Neha Sardana:

Neha has been working as a software developer since 2008 primarily in Java based technologies. She has experience working in the financial industry in both North America and Europe. Neha is a technologist and an OSS enthusiast and loves to talk and blog about all things open source. She recently joined the leadership team of the Garden State Java User Group, a 501(c)(3) non-profit based in Madison, New Jersey.
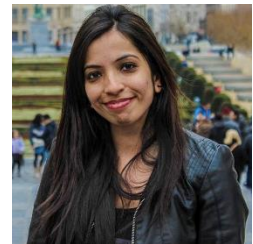
Bitcoin, Blockchain, Cryptocurrency Better than Gold?

By Donald Shu

Track 2 – Security/Technical

Apple co-founder Steve Wozniak believes Bitcoin is better than gold. There are only 21 million Bitcoins being mined, the price is highly volatile from $9000 to $28000. This talk will discuss Cryptocurrency, Bitcoin, Ethereum, Blockchain technology, digital transaction, mining in China, software wallet, security issues, payment providers, major US or European banks adopting Bitcoin, investment options, venture capital firms, risk, benefits, volatility, academia research and industry trends.

About Donald Hsu:

Donald Hsu, PhD., Professor Dominican College, Dissertation Chair University Phoenix, and President Chinese American Scholars Association (CASA). He trained/taught 70 subjects - Accounting to Unix 13,000+. Clients/students work at Amazon, AT&T, Bank of America, Facebook, Goldman Sachs, Google, IBM, JPMChase, Mercedes Benz, Microsoft, Morgan Stanley, New York Presbyterian, Oracle, Salesforce, Siemens, Sony, Toyota, UPS, Verizon and other Fortune 500 firms. CASA ran 25 successful E-Leader conferences in Asia and Europe, http://www.g-casa.com. He traveled to 90 countries in Africa, Asia, and Europe for international business. Don's LinkedIn profile include 8,500+ partners/clients and 207 public recommendations.

2:30 PM Sessions

Developing Big Data at the Intersection of Containerizations and Infrastructure as Code

By Howard Deiner
Track 1 – Applications Development

This presentation comes from a real world problem I faced. Our group knew that it needed to start supporting Apache Hive on Hadoop Clusters. Unhappily, they knew nothing about Hadoop nor Apache Hive. One possibility was for people to start using the AWS Console and start creating AWS EMR (a Amazon managed cluster platform for supporting Hadoop, Map/Reduce, Apache Hive, etc.). I was very much against that idea, since we would not be learning anything, and would be reduced to mere users of a vendor-centric solution that would increase our cost of switching should we wish to change Cloud providers. Instead, I showed the group to learn to run on Docker Desktop orchestrated instances (docker-compose), and gave them Terraform to create clusters in the AWS Cloud, which could be easily customized to our needs using the IaC (Infrastructure as Code) concepts embodied by Terraform. This presentation will look at the issues involved and the code which does all of this. There will be full frontal code shown, but only in a respectful fashion. There will also be a question and answer section at the end.

About Howard Deiner:

Howard is a software consultant and educator who specializes in Agile process and practices. He has a varied background spanning forty six years in the industry, with extensive experience in commercial software, aerospace, financial services, and healthcare services. He has played many of the roles in the development arena, such as developer, analyst, team lead, architect, project manager, and trusted advisor. He has applied the principles of Agile, Lean, and XP development in teams both large and small, in various environments. Howard has educated hundreds of teams and individuals, and is a long-standing member of the ACM and IEEE.

Cybersecurity Issues Regarding Technology Advancements in Social Welfare

By Donna Schaeffer

Track 2 – Security/Technical

The Covid-19 pandemic has affected employment and the social net in countries around the world. Before Covid-19, the Organization for Economic Cooperation and Development (OECD) reported that the number of people world-wide who are either self-employed or employed on a part-time and/or temporary basis is rising. These people are less likely to be unionized and less likely to receive welfare services when out of work. This issue is exacerbated by the pandemic.

The OECD report calls for better social protection coverage for workers in non-standard jobs. Increasingly, social protection systems are integrating technology advances, such as Artificial Intelligence (AI). For example, Denmark has initiated several AI projects with the goal of improving how welfare services are provided to its citizens in need. Examples include programs that identify children at risk of abuse and programs that identify potential fraudulent recipients of benefits. Since Covid-19, we see a proliferation of tracking applications that citizens are encouraged to use as well as more demand on the social net.

The integration of AI, and other technology advances, raise concerns on how to maintain personal and societal cybersecurity. The afore-mentioned systems work with personal information from one's health records, employment information, and data from financial institutions. The systems even pull in information from family members.

In this paper, we discuss policies and legislation that can enhance cybersecurity and protect people's data, privacy, and well-being as technology advances, such as AI, become integrated into the future of work and social welfare.

About Donna M. Schaeffer, PhD:

Dr. Donna M. Schaeffer is a Professor and leads the Cybersecurity program at Marymount University. She has taught in the United States, Germany, and Korea and worked in the telecommunications field. She has won awards for outstanding teaching three times in her academic career. She earned her PhD in the Management of Information Systems from The Claremont Graduate University, an MBA with a specialty in Quantitative Methods and Operations Management, and BA with a dual major in Business and International Relations from Florida International University. Dr Schaeffer has published over 50 articles, book chapters, and papers on a variety of technology-related subjects. She currently serves as Editor of The Journal of Service Science. She is a member of, and has held leadership positions, in several professional computing and civic associations including the ACM, the Decision Sciences Institute, the IEEE, and Women's High-Tech Coalition.

3:30 PM Sessions

Servant Leadership in a Distributed and Disruptive World

By Greg Tutunjian
Track 1 – Applications Development

You can expect to learn a brief history of modern servant leadership and Robert K. Greenleaf's contributions. We will discuss why Greenleaf's work constitutes the fundamental building blocks for a 21st Century servant leadership culture and how Greenleaf's work has been transformed to infuse servant leadership into the modern workplace for individuals, teams and organizations. You will hear about people-centric tools and techniques to foster a servant leadership culture for co-located and distributed teams and what you can do to ensure your distributed teams will benefit from your commitment to servant leadership. You will also learn how to confirm that your distributed teams are benefitting from servant leadership, who the positive disrupters are in your workplace, and why you need them to accelerate servant leadership adoption and maturity.

About Greg Tutunjian:

Greg Tutunjian is a Human-centered Agile and Leadership Coach committed to the development of people, process and product. Greg is a former innovative software engineer who worked from gate-level and microcode to user-experience, artificial intelligence, modeling and simulation. Greg has succeeded in delivering products and solutions as an engineer, a team lead, a manager, a Director and as a Technical Delivery Lead. Greg emphasizes the development of innovative people and adaptive processes as an accelerator of predictive product delivery (not at the expense of people or quality.) Greg is an IEEE Life Member and has a Bachelors' Degree in Mathematics and a Masters' Degree in Computer Science.

Case Study: DevSecOps Prototype to Automate Security Control Assessments

By Richard Eng

Track 2 – Security/Technical

This case study presents how automating mundane manual processes can improve the efficiency of developing and deploying secure software solutions to the end user. Organizations have invested in Agile and DevSecOps philosophies and tools to develop and deploy secure solutions quickly. Industry trends indicate a shift toward the use of DevSecOps to take advantage of the potential to reduce times to deploy new systems. Most federal organizations, following National Institutes of Standards and Technology (NIST) guidance manually collect, track, and report the security control assessment findings needed as part of the authority to operate process. National Institute of Standards and Technology Special Publication (NIST SP) 800-53r4 Security and Privacy Controls for Information Systems and Organizations prescribes security controls that must be met for information systems to receive an Authority to Operate (ATO). A team of researchers decided to automate the SCA process and determine if the automation could provide security assessment findings that were equivalent to the existing manual process and reduce the time and cost of performing the assessments. A Proof of Concept was done to demonstrate that automation of security control assessment findings was technically feasible. A second Pilot with an existing software application was performed to evaluate whether the automation provided results that were equivalent to the existing manual process. The preliminary results indicate that automating the inheritance of security control findings (from other systems and organizations using the same technical solutions) and collecting automated security assessment test results can reduce the time and cost of performing a SCA by over 50%. Other research findings included: SCA automation can be applied regardless of the Software Development Lifecycle used (e.g., Agile, DevSecOps, Waterfall), and the SCA pilot prototype can be applied to other compliance standards (e.g., Section 508 of the Rehabilitation Act). The presentation describes the methodology, technologies employed, the preliminary results, and current lessons learned.

About Richard Eng:

Richard F Eng is Chief Engineer for Applied Software Engineering at the MITRE Corporation. He has over 25 years of senior management and multi-disciplinary systems engineering experience in information systems, telecommunications, financial, and healthcare industries. Recent projects include the practical application of artificial intelligence, machine learning, and data analytics to solve problems. Prior to MITRE, he worked for Noblis, Lucent Technologies, IBM, and Pfizer. He been a guest lecturer on statistics, data science, and a part-time graduate computer science and software engineering instructor. Richard is a Projects in Constrained Environments 2 (PRINCE2) Practitioner and Project Management Professional (PMP). He is an ASQ Certified Software Quality Engineer, Certified Reliability Engineer, and Certified Quality Engineer. Richard is certified as a SAFeAgilist. Richard has a BS in Chemistry and MS in Bioengineering from NYU Polytechnic, MBA from Georgetown University, and a MS in Data Analytics from University of Maryland University College.