Abstracts

Keynote Speakers

9:00 a.m. BU 120 - Sean Stein Auditorium

Nicole Darden Ford, Vice President, CISO, United Technologies

Kathleen McFetridge, Vice President, Infrastructure, United Technologies

How to Use Automation and Emerging Technologies to Solve Real-World Problems

Abstract: An industry shortage of qualified specialized workers and an inability to retain those workers led to an opportunity to leverage augmented reality and business automation. A critical combination of high turnover and few populations to source qualified employees from, led business leaders and technologists to develop virtual teams and training platforms to fill their vital employment needs. With this automation technology, imperative security measures were required to be developed to protect intellectual property, infrastructure details, and personnel safety.

This presentation will examine how developing secure automation solutions may help address difficult situations in industry, along with a discussion on the cybersecurity risks that are inherently part of the development process. Kathleen will illustrate business issues while Nicole will describe the cybersecurity considerations and risk mitigations that encompass a holistic approach to automation across multiple industries.

2:15 p.m. BU 120 - Sean Stein Auditorium

Felix Hartmann, Partner, Hartmann Capital, LLC

"Lightning Talk" Speakers

10:15 a.m. BU 120 – Sean Stein Auditorium

Raymond Golish, Medical Director and Chief Quality Officer, Jupiter Medical Center

Advanced Analytics in Devices and Pharma — Real World Solutions to Manage Risk and Regulation

Abstract: Real-world case studies of advanced analytics in the spinal and orthopedic devices and pharma industries are presented. These are specific cases where advanced analytics drive industry, regulatory affairs, and ultimately touch real patient lives. Examples show that the successful industrial data scientist needs to span the methodological range from structural models including dynamical systems and causal models to empirical probabilistic and statistical methods.

10:30 a.m. BU 120 – Sean Stein Auditorium

Michael Smirnov, Ph. D., Neural Data Scientist, Max Planck Florida Institute for Neuroscience

Training the next generation of scientists: How AI and machine learning are redefining neuroscience

Abstract: Over the past decade, new image analysis tools have emerged for studying the networks, circuits, and synaptic connections in the brain. As data collection exponentially increases in to tera- and petabyte ranges, manual analysis becomes an impossible task on researchers looking to shed insight on the structure and function of subcellular brain regions. Repetitive, routine tasks such as live imaging, image processing, segmentation, analysis, and reporting often require countless hours of work from highly trained scientists. In order to tackle this big data struggle, novel analyses leveraging the power of AI and deep learning are being developed and applied around the world. The fragmented nature of these methods translate to a high barrier of entry into their application, requiring new departments staffed with data scientists and programmers to supplement basic neuroscience research. At the Max Planck Florida Institute for Neuroscience (MPFI), we have partnered with Florida Atlantic University (FAU) and FAU High School to build a neural data science program which recruits top-tier students who are immersed into highly interactive programming, neuroscience, and data science curriculum. These students work closely with MPFI researchers to develop novel science-driven tools which leverage machine learning to help automate and improve analysis, collection, and insight drawn from cutting-edge neuroimaging data unique to our institute.

10:45 a.m. BU 120 – Sean Stein Auditorium

Alice Rose, Senior Product Manager, Modernizing Medicine

Real World Examples of Analytics and AI in Healthcare

Abstract: Modernizing Medicine is a leading healthcare technology company which provides specialty medical practices with a suite of software solutions including its flagship electronic health record (EHR) system, EMA® which is used by more than 15,000 providers across the country. In this talk, Alice will provide real world examples of how physicians can use data to help make more informed medical and business decisions. She will provide examples of the use of artificial intelligence. (AI) in healthcare products and discuss some of the challenges healthcare companies may face when building products with embedded AI.

11:00 a.m. BU 120 – Sean Stein Auditorium

Joe Tossing, Automated Logic Corporation

Cheryl Altany, Strategy Executive for Higher Education, Carrier Global Corporation

Steve Teachout, Business Development Manager, Carrier Global Corporation

Abstract: Primary narrative is **Optimizing Thermal Comfort and Energy Efficiency**, by leveraging data analytics and applied to the built environment. Our industry use case examples demonstrate how Automated Logic designs systems that allow for massive data sets, trends and relationships, to be normalized and presented in rich visualizations to maintain optimum indoor environments at the

highest kw/ton/sq. ft. efficiency possible. We maintain optimum environments at the lowest energy intensity possible.

1. The built environment consumes 60% percent of our national energy. Productivity / greatly impacted by thermal comfort and IAQ / (3/30/300)
    a. Optimum temp: 70 and 74 F and 40-60% Relative humidity
    b. individual user zone, zones drive the output of the larger plants, AHU's, Chillers
    c. Sustainability and reduction of carbon footprint; need to lower the energy intensity
    d. Indoor environments impact productivity (3/30/300) CogFX

Data Analysis Example 1: Thermo Graphic Floor Plans: We aggregate and display visualizations representing deviation from setpoint thru themo-graphic floorplans---
Benefit: reduced maintenance hot/cold calls, rapid identification of problem areas, more productive staff

Data Analysis Example 2: Fault Detection and Diagnostics; Intelligent, active alarm routines, that provide guided insights, and suggested corrective actions.
Benefits: quicker root cause identification, suppression of nuisance alarms; Persistency framework with linked variables; intelligent sequencing, that can be configured to only send alarms when X number of conditions are met, for a variable quantity of inputs.

Data Analysis Example 3: **Environmental Indexing. S**ingle metric to illustrate rolled-up "performance to plan" set-points, (Space Temp, Humidity, VOC, IAQ).
Benefits: Can instantly see how close the campus is meeting comfort conditions, and can manage budgets to that metric, are we willing to lose 5 points of ER to not burn 100kW per hour? What is the cost/comfort analysis? ER can be impacted by asset health (electro mechanical system failures) and entire facility departments can be measured against how well they are able to maintain the ideal indoor comfort conditions that produce optimum occupant performance.

Data Analysis Example 4: Network Health Manager Cloud based utility that allows user to have visualizations in the health of distributed control systems thru automated network diagnostics and resource capacity.
Benefit: Network resiliency and uptime results in fewer outages, disruptions and sustained operations for critical environments
ALC's Network Health Manager is hosted on our Cortix AI platform, user can see CPU Utilization, IP Level Controller utilization and Non-IP Controller Utilizations, packet transmission diagnostics and security overlays-better visualizations and data management allow for more proactive maintenance and asset health, lowering costs and securing uninterrupted indoor environment experiences.
Modern buildings are comprised of sophisticated electro mechanical systems for conveyance, lighting, heating, cooling, security, communications, and all the systems required to maintain clean, safe comfortable environments for our use. These systems can represent thousands and hundreds of thousands of sensed data points. Automated Logic aggregates the these physically sensed data points, from a wide variety of sensors that detect temperature, voltage, strain, pressure, fluids, particles, smoke, light, power and potential and create intuitive and rich visualizations to optimize, control, report and sustain the built environment.

11:15 a.m. BU 120 – Sean Stein Pavilion Auditorium

Yang Wang, Ph. D., Pittsburg Supercomputing Center, Carnegie Mellon University

"Machine Learning for Materials Science"

Abstract: In recent years, machine learning has emerged as a distinct tool for the design and characterization of materials. Especially, the progress of computing power and algorithms, together with the availability of large amount of data obtained from high-throughput quantum mechanical calculations, brings new opportunities for enabling accelerated materials discovery. In this presentation, I will show an upcoming NSF supercomputing facility at Pittsburgh Computing Center which is designed to assist AI and machine learning research activities for academic communities. For machine learning applications, I will discuss the importance of high-performance computing environment and show how the data-to-knowledge transfer enables the characterization of multicomponent random alloys.

"Data Demonstration" Presentations

4:00 p.m. BU 207

Ken Johnson, Ph. D., Associate Dean and Professor of Finance, Florida Atlantic University

The BH&J Buy vs. Rent Index uses publicly available housing data to develop models that measure the pressure on the demand for homeownership in 23 major metropolitan areas around the country. Specifically, the index runs a financial "horserace" between owning a property, incurring the financial benefits and costs of ownership in order to estimate wealth accumulation through equity buildup versus renting the same property and investing monies that would otherwise be invested in ownership in a portfolio of stocks and bonds with the same risk profile as the specific housing market being analyzed.

When wealth accumulation through ownership is greater than wealth accumulation through renting and reinvesting, housing markets should expect to experience upward pressure on the demand for homeownership resulting in property price increases, on average. The opposite is true when wealth accumulation is greater through renting and reinvesting.

4:20 p.m. BU 207

Zdenka Cumano, Graduate Student, Information Technology & Operations Management, FAU

4:40 p.m. BU 207

Joe Widen, Solutions Architect, Databricks

Abstract: Spark was originally created to help a group of students complete the Netflix challenge for making movie recommendations. Over the course of its lifetime, Spark has evolved quite a bit. In this session, we'll talk a little about how Spark works with regards to machine learning, and how we see it used within the business world. In addition, we'll talk about some new developments and exciting new features that have allowed data scientists to do even more with Spark.

In this demo, we'll walk through a newer addition to the databricks platform called Distributed HyperOpt. Distributed Hyperopt uses Spark under the hood to build a number of models with varied hyperparameter inputs. This allows us to find the optimal hyper parameters in a much quicker, cost efficient fashion.

4:00 p.m. BU 208

Zhen Ni, Ph. D., Assistant Professor, Computer Science and Engineering, Florida Atlantic University

A Deep Reinforcement Learning Design for Robot-Assisted Pedestrian Crowd Evacuation

Abstract: A new Artificial Intelligence (AI) trend has emerged with the breakthroughs of deep learning and deep reinforcement learning. The success stories include AI for detecting skin cancer, deep learning for complex (video) games, and so on. Neural networks and machine learning are two of the driving forces for this AI wave. Today's talk will discuss a new design for neural network training, which eventually enhances the reinforcement learning process. A new experience network is designed with a prioritized sampling method to promote the useful information for reflective learning. This design improves the data efficiency and significantly save computation resources of intelligent learning systems. Application on robot-assisted pedestrian crowd evacuation will be provided to show the performance the proposed algorithm. As this is a multi-disciplinary research project, I will also introduce the collaboration opportunities along the direction.

4:20 p.m. BU 208

William Hahn, Ph. D., Machine Perception and Cognitive Robotics &

The Department of Mathematical Sciences, Florida Atlantic University

4:40 p.m. BU 208

RCCL!!!!!!!!!!!!!!!!!!!!!

4:00 p.m. BU 307

Wazir Muhammed, Ph. D., Assistant Professor, Physics, Florida Atlantic University

Data Mining in Radiation Oncology

Abstract: The presentation is about the data miming leading to a big data in radiation oncology. The possible sources of big data in radiation oncology will be briefly discussed. Tracking of organ doses in radiation therapy for patient safety will be introduced and explained in a big data perspective. In doing so, the **P**ersonal **O**rgan **D**ose **A**rchive (PODA) will be described. Different components of PODA particularly, the Monte Carlo dose engine (i.e., Particle Transport in Media) will be described. To describe the role of big data in radiation oncology, prediction and stratification of pancreatic cancer by using personal health data through Artificial Neural Network (ANN) will be presented. At the end, possible role of big data and challenges in data mining will be briefly discussed.