Machine Learning
Artificial Intelligence
Blockchain
Infrastructure & Cybersecurity
Computerized Medicine

CEWIT2021 CONFERENCE

NOVEMBER 3 & 4, 2021

CONFERENCE GUIDE

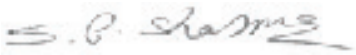
Center of Excellence
WIRELESS AND INFORMATION TECHNOLOGY
AT STONY BROOK UNIVERSITY

WELCOME

Welcome to the 17th annual International Conference and Expo on Emerging Technologies organized by the Center of Excellence in Wireless and Information Technology (CEWIT) at Stony Brook University. The conference has gained international recognition as one of the premier conferences on the development and application of emerging technologies, and for bringing together academic research and industrial innovations at a single forum.

This year's conference showcases the exciting new direction technology is heading toward. Recognizing how the world has pivoted and adapted to new changes due to the pandemic, so has technology pivoted and adapted. One of the biggest changes is how medicine is administered and patients are treated. There is a movement to reform how drug development is conducted as we have seen in the acceleration of COVID vaccine and treatment. AI has become a constellation of technologies that permits machines to sense, comprehend, act and learn and is transforming the relationship between people and technology. Venture Capitalists are looking closely at what is now influencing the flow of capital, and Smart Infrastructure technologies aim to enhance the way people live and work. International panels in the pharma field and on seeking capital directions and relative quantities are highly significant at this time. These, with other technological breakthroughs and explorations, will be discussed over the next two days, along with a particularly relevant presentation regarding Information Overload – it's impact and long-term implications.

The world has joined together to share research, to solve greater problems, and to move into a new era of technology. The scientific discoveries in these fields not only will enhance the economy but will harbinger a totally new era in the way things will work in the new world. It is critical that we drive technology commercialization by quickly moving technologies from research labs to the marketplace which will help enhance economic growth as we emerge out of our COVID cocoon. My heartiest congratulations to all of our Keynotes, Authors, and Panelists; and welcome to all of our participants.



Satya P. Sharma, PhD, MBA
Executive Director
The Center of Excellence in Wireless and Information Technology (CEWIT)

Stony Brook University

LEADERSHIP

Richard Reeder, PhD
Vice President for Research
Stony Brook University

Peter Donnelly
Associate Vice President for Technology Partnerships
Stony Brook University

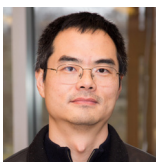
Yacov Shamash, PhD
Co-Chair, CEWIT Advisory Board, Principal Investigator
CEWIT

Satya Sharma, PhD, MBA
Executive Director
CEWIT

Arie Kaufman, PhD
Chief Scientist
CEWIT

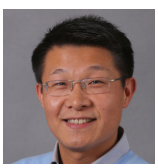
Shmuel Einav, PhD
Director, Medical Technologies
CEWIT

Sangjin Hong, PhD
Director, Globalization
CEWIT



Fan Ye, PhD
Director, Communications and Devices
CEWIT

Bin Zhang
Associate Director, Computing Services
CEWIT



Rong Zhao, PhD, MBA
Director, Software Systems
CEWIT

CEWIT ADVISORY BOARD

Russell Artzt
Co-Chair, CEWIT Advisory Board, Executive Chairman RingLead, Inc.

Jennifer L. Costley, PhD
Director, Physical Sciences, Sustainability & Engineering The New York Academy of Sciences

Bob Sanders
Senior Vice President Zebra Technologies

Otto Berkes
Former CTO CA Technologies

Jim Harding
Former CEO Henry Schein One

Yacov Shamash, PhD
Co-Chair, CEWIT Advisory Board, Principal Investigator CEWIT

Kamal Bherwani
Executive Chairman Magine TV

Masaaki Maeda
Strategic Advisor Asurion, LLC

Satya Sharma, PhD, MBA
Executive Director CEWIT

Richard Boivie, PhD
Senior Technical Staff Member IBM

Christopher Pendergast
Chief Technology Officer Henry Schein, Inc.

Kevin Tracey, MD
President and CEO Feinstein Institute for Medical Research

Steven Cento
Sector Engineering Fellow Northrop Grumman Corporation

Alex Price
Senior Vice President Demand Solutions

Adam Weisman
Retired Partner Deloitte

CEWIT2021 PROGRAM COMMITTEE

Steve Cento
Northrop Grumman Corporation

Shmuel Einav, PhD
CEWIT
Conference Chair

Susan Frank, PhD
Suffolk County Community College

Scott Herskovitz
Qosina

Arie Kaufman, PhD
CEWIT

Bruce Lieberthal
Henry Schein, Inc.

Dave Mesecher
Northrop Grumman Corporation

Ed Palacio
IEEE
Program Committee Co-Chair

Charles Rubenstein, PhD
Pratt Institute

Steven Rubin, Esq.
Beckage

Levi Shapiro
mHealth

Satya Sharma, PhD, MBA
CEWIT

Fan Ye, PhD
CEWIT

Rong Zhao, PhD
CEWIT
Program Committee Chair

Lawrence Weber, PhD
TechMark Corporation

CONFERENCE AGENDA: DAY ONE

Time	Track One	Talk Title	Track Two	Talk Title
8:30am	**CEWIT2021 Conference Welcoming Remarks**			
8:45am	Serkan Kiranyaz, PhD Qatar University/ Tampere University	New-Generation Neural Networks and Applications	Moderator: Michael Lane, *Long Island Capital Alliance* Jeremy Krell, DMD, MBA, *Revere Partners* Neil Cohen, *Emerald Development Managers LP* Yoav Hochberg, *NextLeap Ventures* Rajan Luthra, *Reliance Industries Ltd* Alexandra Choli, *Metavallon.vc*	Venture Capital Session
9:10am	Biswa Sengupta, PhD *Zebra Technologies*	Orchestration AI		
9:35am	Yizhou Wang, PhD *Peking University*	The Complexity of Active Visual Tracking		
10:00am	**BREAK - Visit the Virtual Exhibitor Booths**			
10:15am	Pekka Abrahamsson, PhD *University of Jyväskylä*	From Principles to Action: A Method for Ethically Aligned AI Design and Implementation	Moderator: Gil Bashe, *FINN Partners* Kim Branson, PhD, *GSK* Craig Granowitz, MD, PhD, *Lexicon Pharmaceuticals, Inc.* MaryAnne Rizk, PhD, *Medable*	Accelerating Drug Discovery Panel
10:40am	Amanda Muller, PhD *Northrop Grumman Corporation*	Secure and Ethical AI: Framing the Challenge for National Security		
11:05am	Achille Fokoue *IBM Research*	Answering Questions Using Neuro-Symbolic AI		
11:30am	**BREAK - Visit the Virtual Exhibitor Booths**			
11:55am	Yu Yang, PhD *Lehigh University*	Cyber Physical Systems for On-demand Delivery		
12:20pm	Bob Friday *Juniper*	How AI/ML is disrupting the Networking Industry: A Data-Driven approach to IT Operations		
12:45pm	Ido Aharoni *NYU/ Emerson Rigby Ltd./ Israeli Foreign Service*	Information Overload - It's Impact and Longterm Implementations		
1:10pm	**CEWIT2021 Conference Closing Remarks**			

CONFERENCE AGENDA: DAY TWO

Time	Track One	Talk Title	Track Two	Talk Title
8:30am	**CEWIT2021 Conference Welcoming Remarks**			
8:45am	Jinfang Wang, PhD Yokohama City University	A Convolutional LSTM Model for Predicting the SARS-COV-2 Positives in Japan	Moderator: Arie Kaufman, PhD, *Stony Brook University* Nicole Tricoukes, *Zebra Technologies* Shiqiang Wang, PhD, *IBM Research* Henry Chu, PhD, *University of Louisiana* Mouli Narayanan, *Zeblok Computational*	Applied AI Panel
9:10am	Daniel Holewienko *Henry Schein*	The Key Elements of Successful ML/AI in Healthcare		
9:35am	Su Lu *Purdue University*	Towards Fine-Grained Wireless Human Perception		
10:00am	**BREAK - Visit the Virtual Exhibitor Booths**			
10:15am	Mengqian Zhang *Shanghai Jiao Tong University*	Accelerating Transactions Relay in Blockchain Networks via Reputation	Moderator: Rong Zhao, MBA, PhD, *Stony Brook University* Christopher Niezrecki, PhD, *University of Massachusetts Lowell* Amir Rahmati, PhD, *Stony Brook University* Jon Lenchner, PhD, *IBM T.J. Watson Research Center* Yedendra Shrinivasan PhD, *Twitter Cortex* Jennia Hizver PhD, *AT&T Cybersecurity*	Smart Infrastructure Panel
10:40am	Bruce Swett, PhD *Northrop Grumman Corporation*	Responsible Artificial Intelligence (RAI): An Approach to Policy, Requirements, & Contracting		
11:05am	Wenwen Dou, PhD *UNC Charlotte*	Visual Text Analysis and Applications		
11:30am	Gabi Zodik *IBM Research*	Blockchain – the Myth and Realities		
11:55am	**BREAK - Visit the Virtual Exhibitor Booths**			
12:10pm	Daniel Lasaga *Deloitte*	Applications of MDNs for Anomaly and Risk Detection in Financial Data		
12:35pm	Juntao Wang *Harvard University*	Forecast Aggregation via Peer Prediction		
1:00pm	John Grim *Verizon*	Privacy Breaches in the Cyber Threat Landscape		
1:25pm	**CEWIT2021 Conference Closing Remarks**			

SPEAKERS

Pekka Abrahamsson, PhD
Professor of Information Systems and Software Engineering
University of Jyväskylä

From Principles to Action: A Method for Ethically Aligned AI Design and Implementation

Abstract
There is a common agreement that ethical concerns are of high importance when it comes to systems equipped with Artificial Intelligence (AI). Demands for ethical AI are declared from all directions. As a response, in recent years, public bodies, governments, and universities have rushed in to provide a set of principles to be considered when AI-based systems are designed and used. We have learned, however, that high-level principles do not turn easily into actionable advice for practitioners. Hence, also companies are publishing their own ethical guidelines to guide their AI development. These guidelines do not seem to help the developers. To bridge this gap, we present a method for implementing AI Ethics in practice. The ECCOLA method has been developed in collaboration with researchers and practitioners in the field, and it is under proof-testing in several AI companies. The presentation outlines the method and its practical use cases.

Bio
Dr. Pekka Abrahamsson works as a full professor of information systems and software engineering at the University of Jyväskylä in Finland. He received his PhD in Software Engineering in 2002 from the University of Oulu. His research is in the area of emerging software technologies, empirical software engineering, software startups, and the ethics of artificial intelligence. Before his current position, he has served as a full professor at the University of Helsinki (Finland), Free University of Bolzano (Italy), Norwegian University of Science and Technology (Norway). He also worked at VTT Technical Research Centre of Finland as a research professor of software technologies. He is widely recognized for his academic achievements. He is a pioneer in the field of research on agile software engineering methods and processes. Abrahamsson is the most cited researcher in his field in Finland. He is the first Professor of Software Engineering to be invited to the Finnish Academy of Science and Letters. He has published broadly in his areas of expertise and received many awards and recognitions. Arnetminer named him among the 100 most influential software engineering scientists in the world in 2016. Abrahamsson was awarded the Nokia Foundation Award 2007. He is the Software Startup Research Network (SSRN) co-founder and a seasoned expert in leading large research projects.

Ido Aharoni
Global Distinguished Professor
New York University

Information Overload - It's Impact and Longterm Implementations

Abstract
The age of technology brought about one of the most dramatic revolutions in human history: the information revolution. Technological advancements had far exceeded human evolution. Th human brain is incapable of effectively coping with so many stimulations. It was designed for survivability in a totally different physical and mental environment. The result is information overload. In this talk, NYU's Ido Aharoni Aronoff will explore the phenomenon of information overload, its longterm implications, such as heightened anxiety and effective ways to cope with it.

Bio
Ambassador Ido Aharon is a Global Distinguished Professor at NYU, a Member of International Advisory Council, APCO Worldwide, a 25-year veteran of Israel's Foreign service, a public diplomacy specialist, and is a co-founder and Principal at Emerson Rigby, where he developed their core methodology R-SWIM. He served 25 years in the Israeli Foreign Service, ending as the longest served Israeli Consul to NY. Mayor De Blasio proclaimed July b229, 2016, as "Ambassador Ido Aharoni Day in NYC". Lectures at CEWIT on Technology. Basketball – David Stern and Amare Stodemaier.

Wenwen Dou, PhD
Associate professor
UNC Charlotte

Visual Text Analysis and Applications

Abstract
The increasing amount of textual data bears valuable insights in domains including business intelligence and public policy. While automated text-analysis algorithms produce compelling results on summarizing and mining textual data, the end results are often too complex for average users to make decisions upon. In this talk, I will introduce my research on integrating automated data-analysis algorithms with visual analytics systems that help decision makers make sense of large-scale textual data interactively. I will introduce applications that integrate text-analysis algorithms and interactive visualization of the topics and events. These applications not only facilitate domain experts to make decisions based on insights gained from textual data, but also serve as platforms to study human biases during decision making.

Bio
Dr. Wenwen Dou is currently an associate professor of College of Computing and Informatics and a core faculty member at Charlotte Visualization Center at University of North Carolina at Charlotte. Her research interests include Visual Analytics, Text Mining, and Human Computer Interaction. She works in the cutting-edge research area of Visual Text Analytics, which integrates statistical and machine learning methods with powerful interactive visualization for analyzing large amounts of textual data. Dou has worked with various analytics domains in reducing information overload and providing interactive visual means to analyzing unstructured information. She has experience in turning cutting-edge research into technologies that have broad societal impacts, partially demonstrated by support from both academic and industry partners, including the Pacific Northwest National Laboratory, US Army Research Office, US Special Operations Command, National Science Foundation, US Army Engineering Research and Development Center, and Lowe's company Inc.

Achille Fokoue
Distinguished Research
Scientist and Master
Inventor
IBM Research

Answering Questions Using Neuro-Symbolic AI

Abstract
Organizations and individuals alike are faced with an increased volume, velocity, and variety of their data. They often struggle to answer basic questions about their data and gain insight from it. Given enough training data and supervision, traditional deep learning can help address this problem. Unfortunately, large training data can be very expensive in many domains, and many stakeholders lack the deep technical skills to interact and query the data using structured query languages. A key question is then how can we gain insight and answer questions over the growing volume of complex data with limited technical expertise and limited supervision? In this talk, I will argue that a Neuro-Symbolic AI approach that combines traditional deep learning and symbolic reasoning can learn, with limited supervision, how to answer questions about what is explicitly in the data, what is implied by the data, and what is missing from the data.

Bio
Achille Fokoue is a Distinguished Research Scientist, Master Inventor, and Research Manager at IBM Research AI in Yorktown Heights, NY, where he leads the Foundations of AI Reasoning group. He has over 19 years of research experience in knowledge representation and reasoning focused on developing theories, algorithms, standards, and systems for scaling reasoning over large and expressive knowledge bases that tolerate inconsistencies and uncertainties inherent in knowledge bases populated from unstructured sources. He has led various research efforts on applying machine learning and knowledge representation and reasoning in many domains. He is a co-editor of the OWL 2 Web Ontology Language Profiles specification and has authored or co-authored over 100+ scientific reports and manuscripts that have been cited, in aggregate, more than 3600 times.

SPEAKERS

Bob Friday
CTO and Co-Founder
Mist Systems

How AI/ML is disrupting the Networking Industry: A Data-Driven approach to IT Operations

Abstract
AI/ML is being adopted across all industry segments ranging from automotive, healthcare, agriculture to finance. In this session we will take a look at how AI/ML is being used in networking to build AI assistants that can answer questions and manage networks on par with human network domain experts. And how far away you are from having your own personal AI network IT assistant join your Zoom call.

Bio
Bob Friday is CTO and co-founder of Mist Systems, a Juniper Company. Bob started his career in wireless at Metricom (Ricochet wireless network) developing and deploying wireless mesh networks across the country to connect the first generation of Internet browsers. After Metricom, Bob co-founded Airespace, a start-up focused on helping enterprises manage the flood of employees bringing unlicensed Wi-Fi technology into their businesses. Following Cisco's acquisition of Airespace in 2005, Bob became the VP/CTO of Cisco enterprise mobility and drove mobility strategy and investments in the wireless business (e.g. Navini, Cognio, ThinkSmart, Phunware, Wilocity, Meraki). He also drove industry standards such as Hot Spot 2.0 and market efforts such as Cisco's Connected Mobile Experience. He holds more than 15 patents.

John Grim
Head RDI
Verizon Threat Research Advisory Center

Privacy Breaches in the Cyber Threat Landscape

Abstract
Based on cybersecurity incidents and data breach insight collected from partner organizations and the Verizon caseload, the 2021 Data Breach Investigations Report (DBIR) presents a rare and comprehensive view into the world of corporate cybercrime. Now in its 14th year of publication, thousands of organizations have used the DBIR to evaluate and improve their security programs. The presentation will delve into the state of the cyber threat landscape for the Healthcare and Education sectors and offer solutions to better mitigate, detect, and respond to cyber threat actors.

Bio
Mr. Grim has spent over 19 years leading investigations of data breaches and cybersecurity incidents within the government and civilian sectors. Currently, he heads the research, development, and innovation effort within the VTRAC. Prior to Verizon, he served 12 years with the U.S. Army as a Counterintelligence Special Agent investigating security incidents, and Education sectors and offer solutions to better mitigate, detect, and respond to cyber threat actors.

Daniel Holewienko
Executive Director, Big Data and Business Intelligence
Henry Schein

The Key Elements of Successful ML/AI in Healthcare

Abstract
ML/AI has gained significant adoption in healthcare in the last 5 years and continues to provide opportunities for new and innovative services as well as optimized traditional services. Additionally, ML/AI is offering competitive advantage in healthcare. Faster, more accurate diagnosis... More complete and diverse treatments... Better therapy planning... New predictive/preventive care... Improved drug discovery... Streamlined healthcare workflows... Improved clinical resource management... The list goes on... So, to remain competitive healthcare orgs must partake in ML/AI. However, many struggle to bootstrap their ML/AI initiatives due to high-complexity, high-cost, inadequate tech foundation, and inadequate staff/skills. And statistically the failure rate of ML/AI's projects is close to 85%. So, what should healthcare orgs do? This session will explore the healthcare ML/AI landscape, note adoption/successes/failures, point out the Elements REQUIRED to secure ML/AI success,

and deep dive into a Use-Case with its developers that leveraged these elements to produce Healthcare Value. The discussion will be led by Dan Holewienko, Executive Director, Big Data & Business Intelligence for Henry Schein. Joining him will be two colleagues from Artha Solutions LLC, who specializes in Data Science and ML/AI implementations in the Healthcare domain: Emmanuel Egbo, Management Consultant, Healthcare Analytics, Artha Solutions LLC, and Akhil Alluri, Data Science Consultant Artha Solutions LLC.

Bio

Daniel Holewienko is a 20+ year experienced Technology Executive in the Healthcare, Financial Services, Media, Education, and Retail industries. He started his career in software development and later focused on overall Technology Strategy, Transformation, and Management in mid to large-size regional and global organizations. Along the way, Dan has held Managing Director, Executive Director, Director, VP, CTO, and CIO titles at firms such as Seiko, CIT Group, WNET-Channel Thirteen, Lord Abbett & Co, Kaplan, Northwell Health System, Marlabs, and Henry Schein. He has also been contracted to coach and directed IT and business executives in technology transformation and strategy in such firms as Practising Law Institute, Mizuho Securities, Univision, Roundabout Theater, AppNexus, International Rescue Committee, Ryder, and other brand names clients as Managing Direct of TBT Management Consulting. Dan is presently the Executive Director, Big Data and Business Intelligence at Henry Schein, where he is boot-strapping their Big Data program to consolidate internal and external data globally and use advanced ML & AI technologies, data science, and advance analytics to create higher customer value and new business opportunities. Dan is an active member of the New York Chapter CTO Club and author of numerous industry articles. He has been a guest speaker, panelist, and moderator at dozens of user groups and conferences throughout his career. Dan holds a BA from CUNY and several management and tech-related accreditations/certifications.

Serkan Kiranyaz, PhD
Professor
Qatar University/Tampere University

New-Generation Neural Networks and Applications

Abstract

Multi-Layer Perceptrons (MLPs), and their derivatives, Convolutional Neural Networks (CNNs) have a common drawback: they employ a homogenous network structure with an identical "linear" neuron model. This naturally makes them only a crude model of the biological neurons or mammalian neural systems, which are heterogeneous and composed of highly diverse neuron types with distinct biochemical and electrophysiological properties. With such crude models, conventional homogenous networks can learn sufficiently well problems with a monotonous, relatively simple, and linearly separable solution space but they fail to accomplish this whenever the solution space is highly nonlinear and complex. To address this drawback, a heterogeneous and dense network model, Generalized Operational Perceptrons (GOPs) has recently been proposed. GOPs aim to model biological neurons with distinct synaptic connections. GOPs have demonstrated a superior diversity, encountered in biological neural networks, which resulted in an elegant performance level on numerous challenging problems where conventional MLPs entirely failed. Following GOPs footsteps, a heterogeneous and non-linear network model, called Operational Neural Network (ONN), has recently been proposed as a superset of CNNs. ONNs, like their predecessor GOPs, boost the diversity to learn highly complex and multi-modal functions or spaces with minimal network complexity and training data. However, ONNs also exhibit certain drawbacks such as strict dependability to the operators in the operator set library, the mandatory search for the best operator set for each layer/neuron, and the need for setting (fixing) the operator sets of the output layer neuron(s) in advance. Self-organized ONNs (Self-ONNs) with generative neurons can address all these drawbacks without any prior search or training and with elegant computational complexity. However, generative neurons still perform "localized" kernel operations and hence the kernel size of a neuron at a particular layer solely determines the capacity of the receptive fields and the amount of information gathered from the previous layer. In order to improve the receptive field size and to even to find the best possible location for each kernel, non-localized kernel operations for Self-ONNs are embedded in a novel and superior neuron model than the generative neurons hence called the "super (generative) neurons". This talk will cover a natural evolution of the artificial neuron and network models starting from the ancient (linear) neuron model in the 1940s to the super neurons and new-generation Self-ONNs. The focus will particularly be drawn on numerous Image Processing applications such as image restoration, denoising, and regression where Self-ONNs especially with super neurons have achieved state-of-the-art performance levels with a significant gap.

Bio

Serkan Kiranyaz received his BS and MS degrees in Electrical and Electronics Department at Bilkent University, Ankara, Turkey, in 1994 and 1996, respectively. He received his PhD degree in 2005 and his Docency at 2007 from Tampere University of Technology, Institute of Signal Processing respectively. He was working as a Professor in Signal Processing Department in the same university during 2009 to 2015. He currently works as a Professor in Qatar University, Doha, Qatar. Prof. Kiranyaz has noteworthy expertise and background in various signal processing domains. He published two books, 7 book chapters, 7 patents, more than 90 journal articles in several IEEE Transactions and other high impact journals, and more than 110 papers in international conferences. He served as PI and LPI in several national and international projects. His principal research field is machine learning and signal processing. He is rigorously aiming for reinventing the ways in novel signal processing paradigms, enriching it with new approaches especially in machine intelligence, and revolutionizing the means of "learn-to-process" signals. He made significant contributions on bio-signal analysis, particularly EEG and ECG analysis and processing, classification and segmentation, computer vision with applications to recognition, classification, multimedia retrieval, evolving systems and evolutionary machine learning, swarm intelligence and evolutionary optimization.

SPEAKERS

Daniel Lasaga
Chief Data Scientist
Deloitte

Applications of MDNs for Anomaly and Risk Detection in Financial Data

Abstract
The mercurial nature of fraudsters and the complex systems within which they work render traditional classification models insufficient to capture bad behavior with, often leaving data scientists with unsupervised modeling techniques. We will introduce Mixture Density Networks (MDNs) as a form of one-class classification modeling focusing on the abstraction of normal and periphery activity that is highly tuned to both expectation and variability of where fraud or risk may be. MDNs predict probability distributions of potential output values based on input features. The distribution of outputs can be compared to actual outputs to determine outliers informed by the complexities of the input data via a neural network. MDNs have shown promising results in detecting anomalies and rare-events in complex systems in recent studies. They can be particularly useful predicting a continuous variable in the theoretical parameter space when experimental data has large uncertainties. We will describe the approach of using MDNs and the comparison to traditional anomaly detection techniques to detect business risk or unexpected behavior.

Bio
Dan is a Chief Data Scientist for Regulatory & Legal Support products in Deloitte Risk & Financial Advisory. His skills and experience sit on the vertices of technology, communications, and management. He has former experience in a wide variety of industries including manufacturing, utilities, banking, and ecommerce. His work has taken him in a wide arch stretching from hands on algorithmic programming to high-level interactions with decision makers. He has had the opportunity to publish eminence work on machine learning as well as develop and teach trainings for executives and fellow practitioners. Through Deloitte Advisory, he has had the opportunity to work on exciting projects combining his talents and expertise in structural analysis, data modeling, software engineering and management to tackle fraud detection, manufacturing and supply chain risk and other forms of risk for clients.

Amanda Muller, PhD
Artificial Intelligence Systems Engineer and
Technical Fellow
Northrop Grumman Mission Systems

Secure and Ethical AI: Framing the Challenge for National Security

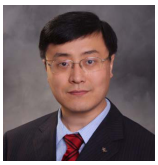
Abstract
Bias in AI is well-studied in commercial applications. In addition to numerous academic papers on the subject, the issue has pervaded the popular awareness as well. Netflix's documentary Coded Bias examined the impact of bias in facial recognition technology, shining an even brighter light on the work of academics like Rama Chellappa of Johns Hopkins University. Popular news media highlighted the racial and gender bias exhibited by the ill-fated Microsoft TAY Twitter bot, which began outputting hateful speech within hours of being set loose on the social media platform. Identifying and counteracting data and algorithmic bias for commercial applications may not be fully resolved, but much work is (rightfully) being done to address it.

In national security applications, however, the nature of AI bias is much less fully understood. The national security realm not only has the same potential for bias as the commercial world, but also has the potential for biases unique to the domain. Insufficient access to data in adversarial environments creates the strong potential for representation bias, which is further exacerbated by institutional stovepipes. Some of these stovepipes are necessary due to security concerns (e.g., the need to separate classified from unclassified data), while others are mandated by law (e.g. Title 10 for Department of Defense vs. Title 50 for the Intelligence Community), and still others are artifacts of long-standing bureaucracy. In addition, the potential for the introduction of bias with malicious intent by adversarial actors is a constant threat within the national security realm.

Because of these unique challenges, addressing bias in national security AI applications requires a different set of strategy and governance processes from what is used in the commercial world. For example, audit rules and bias testing from financial systems could be tailored for use in defense, but must be streamlined for rapid application in the defense environment. Deep knowledge of the mission space is essential to ensuring that anti-bias testing and bias mitigation are executable within the complexities of the national security domain. Collaboration between government, academia, and industry is needed to leverage best practices and adapt them to the unique needs of national security. This collaboration should lead to the development of national security-specific laws and requirements that will allow contractors to develop AI systems that effectively identify and mitigate both intentional and unintentional bias. This presentation will highlight the ways in which commercial developments in anti-bias may be leveraged for national security, the bias challenges that are unique to the national security domain, and the need for strategy and governance specifically for national security applications.

Bio

Dr. Muller is a Senior Staff Artificial Intelligence (AI) Systems Engineer and Technical Fellow based in Northern Virgina. Dr. Muller currently serves as the Secure and Ethical AI Lead for Northrop Grumman. In this role, she is responsible for coordinating the strategy, policy, and governance efforts related to Artificial Intelligence across the Northrop Grumman enterprise. As a Mission Systems Technical Fellow specializing in User Experience and Human-Systems Integration, she also serves as a subject matter expert on proposals, program reviews, and research efforts. Dr. Muller holds a PhD in Engineering from Wright State University in Dayton, Ohio, and BS and MS degrees in Biomedical Engineering from Worcester Polytechnic Institute in Worcester, Massachusetts. She also holds a graduate certificate in Design Thinking for Strategic Innovation from Stanford University. Dr. Muller is a Certified Systems Engineering Professional (INCOSE), Professional Scrum Master (Scrum.org), and is certified in Professional Scrum with User Experience (Scrum.org).



Lu Su, PhD
Associate Professor
Purdue University

Towards Fine-Grained Wireless Human Perception

Abstract

The increasing ubiquity of wireless signals (e.g., WiFi, mmWave, Ultrasound) has extended their role of communication tool to contactless sensing platform, as wireless signals usually carry substantial information that can characterize the surrounding objects. Such contactless sensing ability potentially can enable a wide spectrum of applications, especially those related to human perception. By overcoming the technical challenges faced by traditional camera-based human perception solutions, such as occlusion, poor lighting, as well as privacy issues, and eliminating the need for wearable devices which may bring extra burden and discomfort to the monitored subjects, the wireless human perception techniques can enable a new generation of applications capable of supporting more sophisticated interactions between humans and their physical surroundings. In this talk, I will introduce my recent work towards fine-grained wireless human perception, which aims at not only recognizing human activities, which is the task of classifying each monitored activity to a predefined class, but also reconstructing human postures, which are represented as 3D human skeletons composed of the joints on both limbs and torso of the human body.

Bio

Lu Su is an associate professor in the School of Electrical and Computer Engineering at Purdue University. His research interests are in the general areas of Internet of Things and Cyber- Physical Systems, with a current focus on wireless, mobile, and crowd sensing systems. He received PhD in Computer Science, and MS in Statistics, both from the University of Illinois at Urbana-Champaign, in 2013 and 2012, respectively. He has also worked at IBM T. J. Watson Research Center and National Center for Supercomputing Applications. He has published more than 100 papers in referred journals and conferences, and serves as an associate editor of ACM Transactions on Sensor Networks. He is the recipient of NSF CAREER Award, University at Buffalo Young Investigator Award, ICCPS'17 best paper award, and the ICDCS'17 best student paper award. He is a member of ACM and IEEE.

SPEAKERS

Biswa Sengupta, PhD
Global Head of Machine Learning
Zebra Technologies

Orchestration AI

Abstract
Task management systems in a retail or warehouse logistic environment are often static, wherein tasks and workforce to execute the tasks are planned weeks in advance. Such deferred planning poses a problem where schedules must be changed in response to a dynamic event – like increased foot-fall due to online promotion, health and safety events that cannot be pre-planned, etc. This talk investigates sequential planning algorithms emerging from deep reinforcement learning to sense real-time drivers and constraints to operationalize agents, be it humans or co-bots, for a given task. The proposed framework – Orchestration AI (OAI) – can be used to organize and prioritize tasks and operationalize humans/robots for retail stores, fulfillment warehouses, dark stores, and back-of-store operations.

Bio
Dr. Sengupta has been a senior technical executive with broad-spectrum expertise in leading various ventures – from Artificial Intelligence startups to Fortune 500 (AXA, Huawei and Zebra) companies' AI divisions. He has hands-on experience in leading teams with expertise in incubating commercially viable products using computer vision, Natural Language Processing, reinforcement learning and robotics. He is currently a Technical Fellow and Global Head of Machine Learning at Zebra Technologies. At Zebra, he spearheads special projects (retail, warehouse and healthcare verticals) that sit at the intersection of sequential decision making and robotics (incl. collaborative and autonomous robotics). Biswa obtained his PhD in dynamical systems/optimization/energy efficiency from the University of Cambridge, attaining further training on Bayesian statistics and differential geometry at the University College London. Dr Sengupta is a part of the ACM Steering group responsible for promoting dialogue on technology and computing policy issues with the European Commission and other governmental bodies in Europe and the informatics and computing communities.

Bruce Swett, PhD
Chief Artificial Intelligence Architect & NG Fellow
Northrop Grumman Corporation

Responsible Artificial Intelligence (RAI): An Approach to Policy, Requirements, & Contracting

Abstract
As the Department of Defense (DoD) seeks to gain new capabilities through the rapid deployment of Artificial Intelligence (AI), issues of the responsible development and use of AI (Responsible AI, or RAI) have become increasingly important. RAI is intended to ensure that DoD uses of AI comply with democratic values, the Laws of Armed Conflict, Rules of Engagement, and U.S. law and policy. The U.S. Deputy Secretary of Defense recently highlighted the importance of RAI for the DoD, and assigned the implementation of the DoD's 5 Ethical Principles for AI to the Joint Artificial Intelligence Center (JAIC). The current presentation starts with the list of known AI challenges and vulnerabilities in order to define the AI risk landscape. Issues of data security and bias, vulnerability to adversarial attack, AI model corruption, automated AI model testing and characterization, operational effectiveness testing, cyber security, and explainability will be reviewed. From this risk analysis, we will work backward to identify the tests, processes, decisions, and auditable information needed to ensure that the DoD has justified confidence in AI models and systems. This data-driven foundation will enable an examination of the types of tests, information gathering, stakeholder gates, and evidence that need to be required by policy to eliminate AI vulnerabilities. The AI risk landscape will align the proposed DoD policies with specific AI procurement contracting requirement language. The levels of AI governance, auditing, and oversight – from both the government DoD and defense contractor perspectives – are also presented. An important element of this analysis is connecting the technical test results addressing elements of the AI risk landscape to decision processes involving non-technical AI stakeholders performing AI governance functions. Finally, an overview of the contracting, sustainment, and Intellectual Property (IP) implications for the procurement of AI systems is provided, and a framework for contracting involving AI systems and sub-systems is proposed.

Bio

Bruce Swett is the Chief Artificial Intelligence Architect within the Mission Systems sector of Northrop Grumman, a leading global provider of security systems and solutions. In this role, he is responsible for the design and implementation of integrated cloud computing and artificial intelligence (AI) capabilities across the enterprise. This capability dramatically increases the speed of innovation from Northrop Grumman's commercial and academic partners to fieldable systems. Swett serves as a subject matter expert and consultant in the areas of AI, brain-computer interfaces, and robotics – both nationally and internationally. He recently served on the Pontifical Academy of Science, advising Pope Francis on AI and robotic technologies. He has created intellectual property and patent applications on seven topics related to neurally-inspired AI. Swett completed his PhD in Neuroscience and Cognitive Sciences at the University of Maryland College Park, and completed his Post-Doctoral studies at the National Institute of Deafness and Communications Disorders at the National Institutes of Health. His experimental and computational research focused on using high performance computing to understand how the brain learns and automates sequences, a topic that applies to novel forms of AI. Northrop Grumman solves the toughest problems in space, aeronautics, defense and cyberspace to meet the ever-evolving needs of our customers worldwide. Our 90,000 employees define possible every day using science, technology and engineering to create and deliver advanced systems, products and services.

Jinfang Wang, PhD
Professor and Dean of the School of Data Science
Yokohama City University

A Convolutional LSTM Model for Predicting the SARS-COV-2 Positives in Japan

Abstract

The number of newly infected people with COVID-19 is still increasing at the worldwide level. So far, a large number of papers have been published on predicting the number of infected people. Nevertheless, most of these papers are based on the SIR model and its variants, the basic infectious disease dynamics models developed in the early 1900s. SIR models require strong unrealistic assumptions for modeling real disease dynamics, which is particularly so for the current COVID-19 pandemic. To overcome these difficulties, we propose a deep learning-based method. The proposed method is a neural network model consisting of appropriately designed convolutional LSTM layers, which enable incorporation of relevant temporal and geographic covariates, including the daily number of COVID-19 positives.

We will demonstrate the usefulness of the proposed method by applying it to the temporal-spatial data of the 23 wards of Tokyo to predict the daily number of new positives of COVID-19 in short-term prediction approach. We use the data from April 2, 2020 to November 30, 2020 for training the model, and data from December 1, 2020 to December 31, 2020 for testing the performance of the model. Since convolutional LSTM layers require that the inputs are images, we mapped the numbers of daily new positives and the covariates in corresponding wards to the map of Tokyo. Then we make windows of consecutive samples from the series of static images we made. The model makes a next day prediction based on one of the windows of it. We iterate prediction for the testing period. Our experiments demonstrated that our method outperforms SIR models in terms of MSE and MAE.

Bio

Jinfang Wang was appointed Dean of School of Data Science, and Chairperson of Division of Data Science, Graduate School of Data Science, Yokohama City University, Japan in April 2020. Before joining Yokohama City University, he was Professor, Department of Mathematics, Chiba University, Japan, teaching and doing research in Statistics. Dr. Wang holds a bachelor's in mathematics from Yangzhou University, China, a master's and PhD degree in Statistics from Chiba University Japan. Dr. Wang started his career in 1996 as a researcher in Statistics at the Institute of Statistical Mathematics, Japan, a top research institute in Statistics in Asia and the world as well. He has published many books and research papers and given many invited lectures in his area. He has also served many professional committees, including Director of the Japan Statistical Society, the Vice Chairperson of School of Statistical Thinking, the Institute of Statistical Mathematics, the Chairperson of Higher Certificate and Graduate Diploma jointly sponsored by the Royal Statistical Society &the Japan Statistical Society.

SPEAKERS

Juntao Wang
Research Assistant at
EconCS Group
Harvard University

Forecast Aggregation via Peer Prediction

Abstract
Crowd sourcing enables the solicitation of forecasts on a variety of prediction tasks from distributed groups of people. How to aggregate the solicited forecasts, which may vary in quality, into an accurate final prediction remains a challenging yet critical problem. Studies have found that weighing expert forecasts more in aggregation can improve the accuracy of the aggregated prediction. However, this approach usually requires access to the historical performance data of the forecasters, which are often not available. In this talk, he will introduce our work on aggregating forecasts without using historical performance data. We propose using peer prediction methods, a family of mechanisms initially designed to truthfully elicit private information in the absence of ground truth verification, to assess the expertise of forecasters, and then using this assessment to improve forecast aggregation. Our aggregators significantly and consistently improve the aggregation accuracy w.r.t. a variety of existing aggregators over a diverse collection of human forecast datasets.

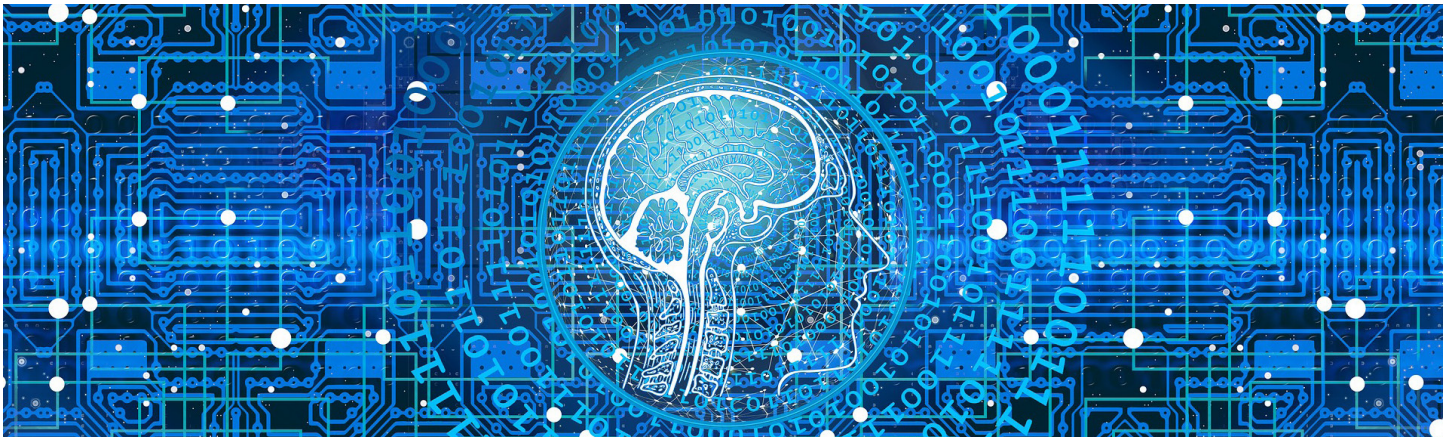
Bio
Juntao Wang is a fifth-year PhD student at the School of Engineering and Applied Science at Harvard University. He received his BS and MS degrees in computer science from Shanghai Jiao Tong University. His research interests lie in developing more practical algorithms and mechanisms that leverage the collective intelligence of humans to solve challenging tasks. His algorithm has been adopted by replicationmarkets.com, which generates forecasts for the replicability of open social science studies using collective intelligence.

Yizhou Wang, PhD
Professor
Peking University

The Complexity of Active Visual Tracking

Abstract
Autonomous learning is becoming a core topic in A.I. research. In this talk, I will first introduce a near-realist virtual environment for artificial agents to learn to fulfill tasks via exploration and interaction. I will also introduce a number of recent projects about training single/multi-agent autonomous systems in such environments to track target objects "autonomously".

Bio
Yizhou Wang, Endowed Boya Professor, Vice Director of CFCS at Peking University. He received his Bachelor's degree in Electrical Engineering from Tsinghua University in 1996, and his PhD in Computer Science from University of California at Los Angeles (UCLA) in 2005. He joined Xerox Palo Alto Research Center (Xerox PARC) as a research staff from 2005 to 2007, and later Computer Science Department of Peking University till present. Dr. Wang has published over 150 papers and obtained a number of best paper awards. His research interests include computational vision, Cognitive Computing, medical image analysis, and computational arts.



Yu Yang, PhD
Assistant Professor
Lehigh University

Cyber Physical Systems for On-demand Delivery

Abstract
In this talk, Dr. Yang will introduce our group's work on the foundations and applications of Human Cyber Physical Systems with a concrete use case of on-demand delivery as part of the Gig Economy. The key challenge for on-demand delivery is to obtain real-time gig worker status in a cost-efficient approach to enable timely delivery and efficient order scheduling. However, the existing sensing approaches in both industry and academy has limited scalability due to cost issues. Based on our collaboration with Alibaba On-demand Delivery Platform, he will introduce a nationwide sensing system called aBeacon exploring a hybrid solution of hardware, software, and human participation. aBeacon detects and infers the status of more than 3 million workers in 364 cities in China via a sophisticated trade off between performance, cost, and privacy. Mr. Zhang will provide some lessons learned and insights when aBeacon evolves from the conception to design, deployment, validation, and operation. Finally, he will discuss a few new challenges and open problems in Cyber Physical Systems.

Bio
Dr. Yu Yang is an Assistant Professor in the Department of Computer Science and Engineering at Lehigh University. He obtained his PhD in Computer Science from Rutgers University. He is broadly interested in Mobile Sensing, Ubiquitous Computing, Data Science, and Cyber-Physical Systems. His current research is focused on sensing, prediction, and decision making for cross-domain mobile systems including taxis, buses, trucks, bikes, mobile payment, and cellular networks with applications for Smart Cities and Gig Economy.

Mengqian Zhang
PhD Candidate
Shanghai Jiao Tong University

Accelerating Transactions Relay in Blockchain Networks via Reputation

Abstract
For a blockchain system, the network layer is of great importance for scalability and security. The critical task of blockchain networks is to provide a fast delivery of data. A rapid spread accelerates the transactions to be included into blocks and then confirmed. Existing blockchain systems, especially the cryptocurrencies like Bitcoin, take a simple strategy that requires relay nodes to verify all received transactions and then forward valid ones to all outbound neighbors. Unfortunately, this design is inefficient and slows down the transmission of transactions. In this talk, she will introduce the concept of reputation and propose a novel relay protocol, RepuLay, to accelerate the transmission of transactions across the network. First of all, we design a reputation mechanism to help each node identify the unreliable and inactive neighbors. In this mechanism, two values are used to define one's reputation. Each node keeps a local list of reputations of all its neighbors. Based on the reputation mechanism, RepuLay adopts probabilistic strategies to process transactions. More specifically, after receiving a transaction, the relay node verifies it with a certain probability, which is deduced from the first value of sender's reputation. Next, the valid and unverified transactions are forwarded to some neighbors. Each neighbor has some probability to be chosen as a receiver and the probability is determined by its second value of reputation. Theoretically, we prove that our design can guarantee the quality of relayed transactions. Further simulation results confirm that RepuLay effectively accelerates the spread of transactions and optimize the usage of nodes' bandwidths.

Bio
Mengqian Zhang is a fourth-year PhD student in the Department of Computer Science and Engineering at Shanghai Jiao Tong University, Shanghai, China. Before this, she got the BE degree in computer science from Ocean University of China in 2018. Since July 2019, she has been a visiting scholar at Center on Frontiers of Computing Studies, Peking University. Her research interests include blockchain and algorithmic game theory.

SPEAKERS

Gabi Zodik
Director of Blockchain and IoT Platforms
IBM Research

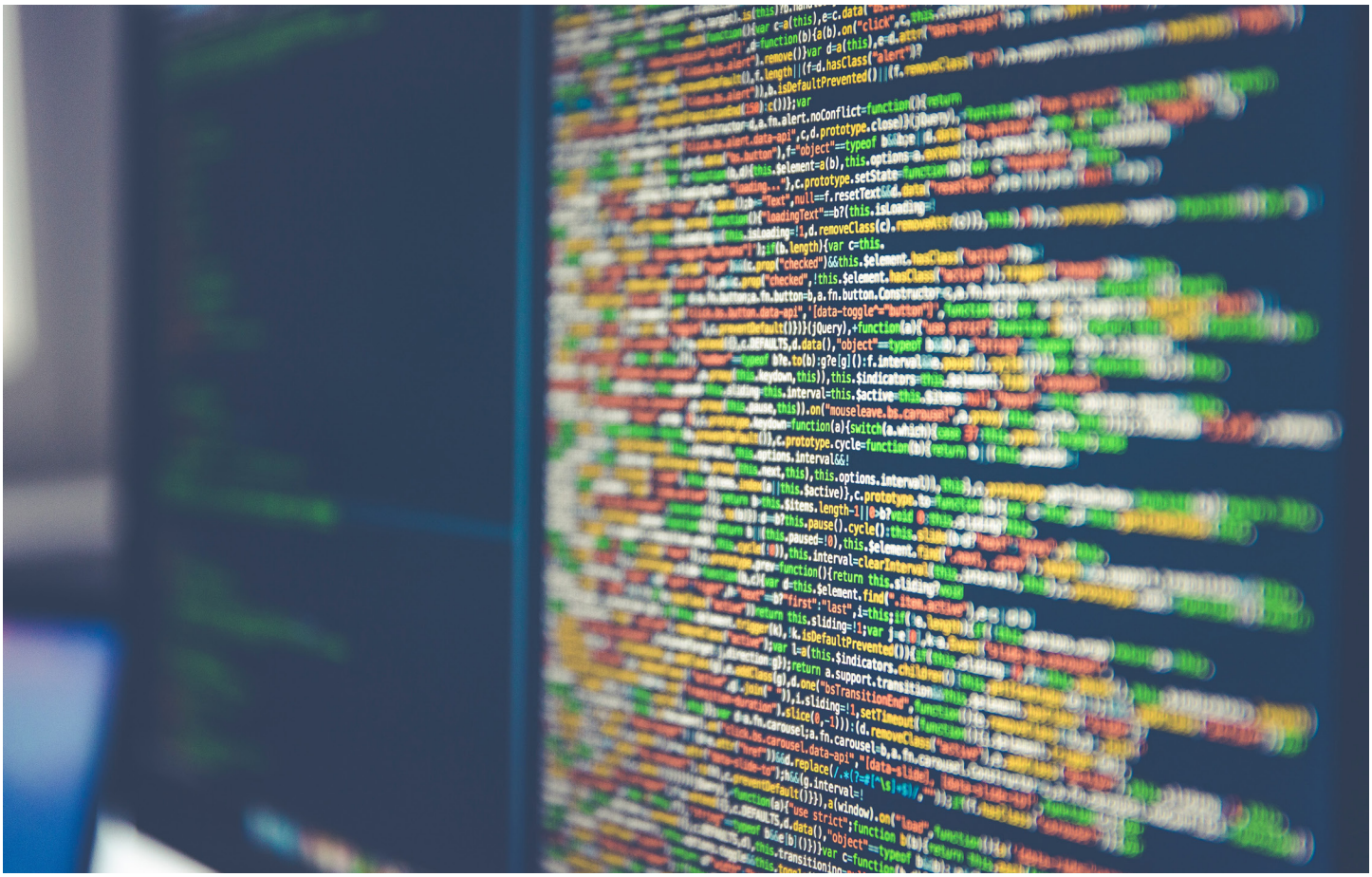
Blockchain – the Myth and Realities

Abstract

This talk covers cutting edge research technologies that enhance our Blockchain offerings and services, via a new Blockchain Middleware layer. In this talk we shall cover the following innovations: A new centralized blockchain model, based on database concepts enhanced with blockchain characteristics; Advanced privacy preserving AI/analytics frameworks, based on zero knowledge proofs and multi party computation, applied to our leading solutions like BTS (Blockchain Transparent Supply); Decentralized digital identity technology and it's implementation in Health Pass, providing a solution for tracking Covid-19 vaccines and tests; Digital Tokens with privacy and how they are revolutionizing the banking industry with CBDC (Central Bank Digital Currency), covering our engagements with Bank of France; Crypto Currency platform that allows us to connect the physical and digital world and provide the ultimate provenance in supply chain scenarios; Blockchain interoperability framework that allows to transfer Tokens, data and do atomic transactions across different DLT technologies such as HLF and Corda

Bio

Gabi Zodik is the Director of Blockchain and IoT Platforms for IBM Research. He works on strategy to transform the fascinating ideas of IBM Research scientists around the world into new blockchain and IoT technology that brings value to clients around the world. Gabi's vision is to harness blockchain technology for existing processes and transactions so they execute in seconds instead of days or weeks, increase privacy so individuals own and manage their digital identities, and build applications that have more transparency for all the stakeholders involved. He also manages the Blockchain and IoT Technologies department at IBM Research - Haifa. In this role, he oversees the lab's R&D efforts in blockchain, IoT, 5G/Edge, Drone solutions. Gabi has an MSc and BSc in electrical engineering from the Technion, and an MBA from the University of Haifa. He is a frequent speaker on the challenges and opportunities in blockchain and the future of AI and IoT systems.



ACCELERATING DRUG DISCOVERY PANEL

Gil Bashe
Chair of Global Health
FINN Partners
Moderator

Bio
Gil Bashe, Chair Global Health at FINN Partners, among the world's largest communication agencies, is an advocate for health innovation to improve the human condition. He serves on the Decentralized Trials and Research Alliance, CNS Summit Leadership Council, Galien Foundation, Let's Win for Pancreatic Cancer, mHealth Israel, and Marfan Foundation advisory boards and is a strategic advisor to Newtopia, VyTrac, Resilient Health and Digital Salutem. Gil is listed as a "Top Ten Digital Health Influencer" by Symplur; among "The Top Brains in the New World of Work" by Fast Company; a "Top 50 Health Influencer" by Medika Life; recognized by the PRSA Health Academy for "Excellence in Public Relation;" selected for the PR News "Hall of Fame," and is the recipient of the PM360 "Trailblazer Lifetime Achievement Award."

Kim Branson, PhD
SVP Global Head of Artificial Intelligence and Machine Learning
GSK

Bio
Dr. Kim Branson is SVP, Global Head, AI/ML at GSK, based in San Francisco. Kim leads the GSK.ai team, a global organization of nearly 100 machine learning researchers and engineers who are pioneering the application of AI to drug discovery and development. Kim brings a deep expertise in modeling and machine learning to drug and vaccine discovery, combining perspectives spanning academia to technology start-up. Under his leadership, GSK has built one of the industry's few completely in-house AI efforts to unlock the potential of complex genetic data and leverage GSK's industry-leading collaborations. Kim joined GSK in 2019 from Genentech where he was Head of AI, Early Clinical Development. Kim has been involved in large-scale machine learning and medical informatics initiatives for more than 20 years over a range of ventures from computational drug design to disease risk prediction. Previously Kim helped found several Silicon Valley start-ups, including Discovery Engine (acquired by Twitter in 2009), Gliimpse as Chief Scientist (acquired by Apple in 2017), and Lumiata, a predictive health analytics company. Kim received degrees from the University of Adelaide and a PhD from the University of Melbourne. He was a Peter Doherty fellow and received postdoctoral training at Stanford University.

Craig Granowitz, PhD
Senior Vice President and Chief Medical Officer
Lexicon Pharmaceuticals, Inc.

Bio
Craig Granowitz, MD, PhD has been our senior vice president and chief medical officer since July of 2021. Dr. Granowitz previously served as chief medical officer of Amarin Corporation plc since January 2016. Prior to joining Amarin, Dr. Granowitz served as senior vice president and head of global medical affairs, global human health of Merck & Co., Inc. and in a variety of medical and commercial management positions for Schering-Plough Corporation. Dr. Granowitz received his BA from Dartmouth College and his MD and PhD from Columbia University.

MaryAnne Rizk, PhD
Chief Strategy Officer
Medable

Bio
Dr. Rizk is leading the transformation charge in expanding global partner and innovation ecosystems for the modernization of digital trials at Medable, the leader in Decentralized Trials. With more than 20 years of experience, Dr Rizk has been managing partnerships to accelerate clinical development across her career in technology (Oracle, Medidata), pharmaceutical (Merck), and clinical research organizations (IQVIA) and retail pharmacy (CVS). Her expertise includes providing biopharma executives access to leading innovations that provide scientific insights, intelligence and convenience for patients. Results include acceleration and automation of drug development powered by cloud SaaS platforms, AIML, advanced analytics, connected devices through a leading ecosystem of collaborations and partnerships.

APPLIED AI PANEL

Arie Kaufman, PhD
Distinguished Professor & Chief Scientist
Stony Brook University
Moderator

Bio
Arie Kaufman is Distinguished Professor of Computer Science, Director of the Center of Visual Computing (CVC), Chief Scientist of the Center of Excellence in Wireless and Information Technology (CEWIT), and Site Director of the NSF Industry University Cooperative Research Center (IUCRC) for Visual and Decision Informatics (CVDI) at Stony Brook University. He served as Chairman of the Computer Science Department 1999-2017. He has been conducting research for 40 years in visualization, virtual-reality, medical imaging, machine learning and their applications, has published more than 350 refereed manuscripts, has delivered more than 20 invited keynote talks, has been awarded/filed more than 100 patents, and has been a principal/co-principal investigator on more than 130 research grants. He is a Fellow of the National Academy of Inventors (NAI), Fellow of IEEE, Fellow of ACM, was elected to the European Academy of Sciences, a recipient of the IEEE Visualization Career Award, and was inducted into the Long Island Technology Hall of Fame and the IEEE Visualization Academy, and the recipient of numerous other awards. He was the founding Editor-in-Chief of the IEEE Transaction on Visualization and Computer Graphics (TVCG), 1995-1998. He has been the co-founder/papers co-chair of IEEE Visualization Conferences, Volume Graphics Workshops, Eurographics/SIGGRAPH Graphics Hardware Workshops, and ACM Volume Visualization Symposia. He served as Chair and Director of IEEE CS Technical Committee on Visualization and Graphics. He received a PhD in Computer Science from the Ben-Gurion University, Israel, in 1977.

Henry Chu, PhD
Title
University of Louisiana

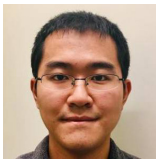
Bio
Henry Chu received BSE and MSE degrees from the University of Michigan and his PhD degree from Purdue University, West Lafayette, Ind. Since 1988 he has been with the University of Louisiana at Lafayette where he is currently the Lockheed Martin/Louisiana Board of Regents Professor of Computer Science/Computer Engineering and the Executive Director of the Informatics Research Institute. At the University, Henry Chu leads and conducts research in machine learning and data science. His recent research has investigated problems related to collating and analyzing data from different sources to address such societal issues as improving health systems performance and disaster recovery planning. He leads a project that supports the data management and analytics needs of the Louisiana Department of Health.

Mouli Narayanan
Founder and Chief Executive Officer
Zeblok Computational

Bio
Mouli Narayanan has started companies, raised capital, and developed strategic customers/markets in the areas of fintech, digital health, and data center technologies, and delivered on transformational technologies, including in IoT and AI. In various senior technology and innovator roles at JPMorgan and BearStearns, he has delivered on the most extensive grid computing system on Wall Street for quant, an award-winning brokerage workstation technology, a global order, and execution management technology that traded $4 billion notional daily, and a market-leading clearing platform integrating partners, on-prem and cloud technologies. His deep-tech background spans high-performance computing, distributed and enterprise computing, GPU acceleration, messaging systems, cloud architectures, AI, and algorithms. He has published papers, holds a patent in enterprise messaging systems, is an advisory board member in NSF CVDI, and an advisory board member at Shenzhen IoT. He holds a Master of Science in Computer Science & Engineering from Penn State University.

Nicole Tricoukes
Senior Maverick
Zebra Technologies

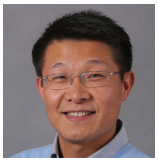
Bio
Ms. Tricoukes is focused on future enterprise AR/VR systems and emerging wearable technologies for the chief technology officer at Zebra Technologies. She was previously in charge of the Motorola Solutions headset computer program. Formerly a member of a TSA federal task force to help protect airlines, She worked across disciplines for Tiffany & Co. and consulted through A.T. Kearney before joining Symbol Technologies and Motorola Solutions to help drive the adoption of new product innovations with external technology partners. She graduated top ranked from Northwestern University in 2002 and Rensselaer Polytechnic Institute in 2000. Nicole has a master's in integrated marketing communications and a bachelor's in management with a minor in French.



Shiqiang Wang, PhD
Research Staff Member
IBM Research

Bio
Dr. Wang is a Research Staff Member in the Distributed AI Department at IBM T. J. Watson Research Center. He received his PhD from Imperial College London in 2015. His current research focuses on the interdisciplinary areas in distributed computing, machine learning, networking, optimization, and signal processing. Dr. Wang received the IEEE Communications Society Leonard G. Abraham Prize in 2021, IBM Outstanding Technical Achievement Award (OTAA) in 2019 and 2021, multiple Invention Achievement Awards from IBM since 2016, Best Paper Finalist of the IEEE International Conference on Image Processing (ICIP) 2019, and Best Student Paper Award of the Network and Information Sciences International Technology Alliance (NIS-ITA) in 2015.

SMART INFRASTRUCTURE PANEL



Rong Zhao, PhD, MBA
Director, Software Systems
CEWIT
Moderator

Bio
Dr. Rong Zhao is Director of Software Systems Division of CEWIT, a faculty member of Department of Computer Science, and an adjunct faculty member of the College of Business and Department of Technology and Society at Stony Brook University. He is Managing Director of the Center for Visual and Decision Informatics, which is an Industry/University Cooperative Research Center designated by the National Science Foundation. He is also a coordinator for the New York State Strategic Partnership for Industrial Resurgence (SPIR) program.

Jennia Hizver, PhD
Principal Architect
AT&T Cybersecurity

Bio
Jennia Hizver is recognized as one of AT&T's experts on cybersecurity. She helps customers with designing, building, and implementing networks to ensure that data, applications, and systems remain secure. She possesses both a deep and wide background in information security being applied across a wide range of technologies. Jennia is a Certified Information Systems Security Professional (CISSP) and a Certified Information Privacy Professional/US (CIPP/US). She holds PhD in Computer Science from Stony Brook University, NY and published security research papers with the focus on improving system and network security.

Jonathan Lenchner
Sr. Technical Staff Member and Master Inventor,
Computer Science Foundations
IBM T.J. Watson Research Center

Bio
Jon Lenchner is a Senior Technical Staff Member at the IBM T.J. Watson Research Center in Yorktown Heights, NY. Previously he was the Chief Scientist of the IBM Research Africa labs in Kenya and South Africa. He has developed robots to help with data center energy efficiency and for greeting visitors at the IBM lab. He has also worked on highly instrumented, smart spaces and smart conference rooms, including a highly instrumented "war room" to help the professional basketball team, the Toronto Raptors, with trades and draft picks.

Christopher Niezrecki, PhD
Professor and Chair, Department of Mechanical Engineering
University of Massachusetts Lowell

Bio
Christopher Niezrecki is a Distinguished University Professor and Chair of the Department of Mechanical Engineering at the University of Massachusetts Lowell. He is currently the Co-Director of the Structural Dynamics and Acoustic Systems Laboratory, and leads the Center for Wind Energy at UMass Lowell. Dr. Niezrecki is also the Director of the NSF-Industry/University Cooperative Research Center for Wind Energy Science Technology and Research (WindSTAR). He has been directly involved in vibrations, acoustics, smart structures, controls, and renewable energy research for over 30 years, with more than 190 publications. Areas of current research include: renewable energy systems, wind turbine dynamics, monitoring, and inspection, structural dynamic and acoustic systems, smart structures, signal processing, structural health monitoring, optical sensing, and smart materials.

Amir Rahmati, PhD
Assistant Professor
Stony Brook University

Bio
Dr. Rahmati is an Assistant Professor in the Department of Computer Science at Stony Brook University where he leads the Ethos Security & Privacy lab. He earned his PhD in Computer Science & Engineering from the University of Michigan in 2017. His research focuses on the security of emerging technologies including Machine Learning and Internet of Things. His works involve designing, building, and evaluating systems that tackle security challenges in these domains. Rahmati's research has received frequent attention from media outlets including MIT Technology review, Washington Post, and Bloomberg. His work on the security of autonomous driving systems is currently on display at London Science Museum.

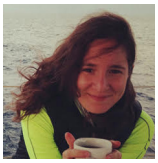
Yedendra Shrinivasan, PhD
Title
Twitter

Bio
Dr. Yedendra Shrinivasan is passionate about sustainable and transparent food supply and has more than a decade of technical leadership experience in software/ML engineering and industry research. He currently works at Twitter. At Tralexho, his team is currently building technologies for enabling traceability and transparency in the supply chain. Previously, as a chief architect and engineering lead at IBM, he led the design and implementation of various blockchain and ML-based solutions for ensuring food safety, efficient decentralized trade transactions, and empowering customers with trust-able information about the products they consume. He holds a PhD in Visual Analytics from the Eindhoven University of Technology.

VENTURE CAPITAL PANEL

Michael Lane
Chairman
Long Island Capital Alliance
Moderator

Bio
Michael Lane has been a chairman of the Long Island Capital Alliance since 2013, and was recently elected Chairman. He has held various leadership positions throughout his career in global consulting firms, technology companies, and some of the world's largest financial institutions. He has raised multiple rounds of capital for his early stage companies from private investors, venture capital firms, and strategic partners such as Accenture, Bank of New York, and Microsoft, with successful exits delivering significant investment returns for shareholders. His experience and counsel are frequently sought to advise on the challenges relating to business start-ups, funding and capitalization, operations, sales and marketing, leadership, and other organizational opportunities. Mr. Lane also serves as CEO of a new venture called SteriLux Systems, as well as positions on various company and industry boards. He earned a BA degree from UCLA and an MBA from Columbia Business School.



Alexandra Choli
Partner
Metavallon.vc

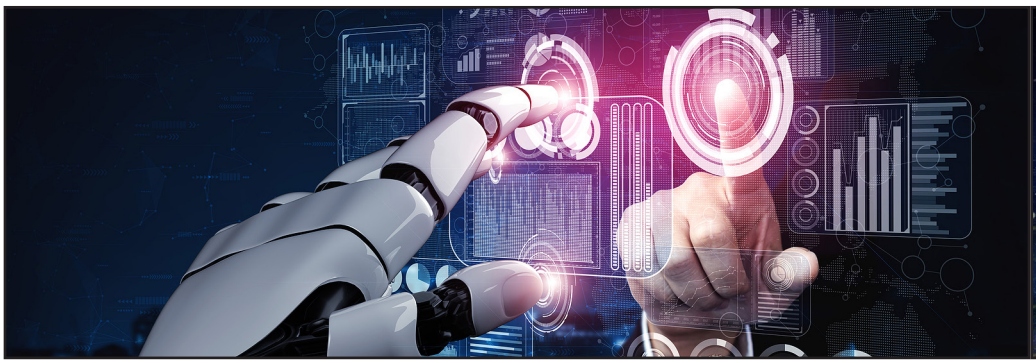
Bio
Alexandra Choli is a Founding Partner at Metavallon VC, a venture capital fund investing in very early stage technology companies across Europe. She is an experienced professional in the fields of operations, business development and strategy, an avid entrepreneur and founder of both impact and mainstream ventures, and an active angel and institutional investor in Greece and internationally. In 2011, Alexandra founded Metavallon.org, a model social enterprise that spearheaded the formation of the startup ecosystem in Greece, and four years later she launched Metavallon Ventures Limited, a micro-fund that pioneered pre-seed investments in the country. In recognition for her pioneering work and entrepreneurial achievements the past decade, Alexandra has been featured in university and publication case studies, was among Fortune's 40 Under 40 in 2020, and was presented the 'Entrepreneur of the Year' Award in 2018 by the British Council. She holds a Masters degree from University College London and a Master degree from NYU.

Neil Cohen
Founder and Chairman
Emerald Development Managers LP

Bio
Neil Cohen is the Founder and Chairman of Emerald Development Managers LP, a Venture Capital firm founded in 1994. He is also Co-Founder, Co-CEO, and a Member of the Executive Committee of American Rock Salt Company LLC, the largest salt mine in the US. Mr. Cohen serves as a Board Director of Babson Diagnostics, Inc., Proscia Inc., Sustained Nano Systems LLC, and TBT Pharma Inc., and as a Board Observer for LifeSprout, Inc., Torigen Pharmaceuticals, and WATT Fuel Cell Corp. Mr. Cohen is a member of the Advisory Board of the Whiting School of Engineering at The Johns Hopkins University and the Board of Advisors of the Columbia University Irving Medical Center. Neil holds a MS in Management from the MIT Sloan School of Management and a BES in from The Johns Hopkins University.

Yoav Hochberg
Managing Partner, Founder
NextLeap Ventures

Bio
Yoav Hochberg is a co-Founder and Managing Partner in NextLeap Ventures. He is a Board member and Strategic consultant to startups and multinational corporations, an executive coach, and adjunct senior lecturer in the Technion. Hochberg is also the strategic advisor and a mentor in the Technion accelerator. Formerly a Vice president of Strategic Planning and Business Development at Intel Corporation with over 35 years of experience in the development of Hardware and Software, leadership and management of technology teams, strategic investor in Intel capital. Hochberg established and led the Mobile Platform Group Business Development organization. In this role Hochberg was responsible for driving the worldwide deployment of Wifi as part of the Centrino Launch. He received twice the INTEL Achievement award, Intel's highest award, holds a BSC in computer engineering and an MBA from the Technion.



Jeremy Krell, DMD, MBA
Managing Partner
Revere Partners

Bio

Dr. Jeremy Krell is a general dentist, as well as an experienced investor with a business background. He is currently the Managing Partner at Revere Partners, the first and only Venture Capital fund for oral health. He has raised rounds and generated returns for investors at ten companies, sold three, and acquired two more as a key operator. Jeremy oversaw strategic provider innovation and development at Oscar Health, a health insurance company that had an IPO in 2021. He also led provider and clinical growth initiatives at quip, a subscription oral health company, and has since built the Barchester Bay Group, a portfolio consisting of over thirty separate ventures, within which he has held roles such as Head of Marketing at Simplifeye and Chief Marketing Officer at Verena Solutions. Jeremy is an angel investor and sits on the boards of several healthcare and dental startups. He has a fifteen-plus year proven track record with start-ups, multi-million dollar fundraises, and acquisitions.

Rajan Luthra
Head of Special Projects
Reliance Industries Ltd

Bio

Mr. Rajan Luthra heads Special Projects in the Chairman's Office at Reliance Industries Ltd., India's largest enterprise. He has acquired proficiency in leading impactful technology, innovation, risk management, and public policy initiatives over three decades. He has been engaged in Reliance's hydrocarbon, retail and digital services businesses during start-up and scale-up phases. He currently leads a core digital platform team and is driving the design and execution of path-breaking Integrated Operations Centres. As a technocrat, he was a key member of entrepreneurial teams in auto-ID, packaged software, and electronic security ventures. He has been among the earliest adopters of transformative fourth industrial revolution technologies including IoT, biometrics, drones, AI, and computer vision and has deep connects with global innovation ecosystems.

EXHIBITORS

CARTER DELUCA & FARRELL LLP a leader in intellectual property law, provides cost effective services to clients around the world, protecting innovations in a wide range of technologies. Throughout the phases of product or brand development, we form a critical part of our client's development teams to provide preparation, prosecution and clearance services to maximize protection while navigating through freedom-to-operate challenges. We also provide extensive IP due diligence services and IP asset assimilation to help our clients achieve their business objectives.

Center for Biotechnology at Stony Brook University is an Empire State Development Division of Science, Technology and Innovation (NYSTAR) Center for Advanced Technology. The Center for Biotechnology serves as an important catalyst in the development of new biomedical technologies and emerging companies in New York State. Through groundbreaking initiatives, the Center supports technology commercialization and company formation by bridging the gap between discovery and commercial success, and training the next generation of biomedical leaders.

IEEE is the world's largest technical professional organization dedicated to advancing technology for the benefit of humanity. Our core purpose is to foster technological innovation and excellence for the benefit of humanity.

INTELIBS develops and provides unique 3G, 4G and WiFi wireless coverage and capacity solutions with products and services for Distributed Antenna Systems (DAS) to meet U.S. carrier and enterprise wireless needs.

HOFFMANN & BARON, LLP is Long Island's premier Intellectual Property law firm, possessing expertise in all areas of technology. Since 1984, Hoffmann & Baron has provided the umbrella of Intellectual Property protection that stimulates innovation and economic growth. The firm's practice includes prosecution, counseling, licensing and litigation of patent, trademark and copyright-related issues worldwide. In the patent area, we serve clients in all major scientific and engineering fields.

JAPANESE CHAMBER OF COMMERCE AND INDUSTRY OF NEW YORK, INC. Established in 1932, JCCI is committed to facilitating a better understanding of business and cultural practices between the United States and Japan. For 85 years, the Chamber has served as a catalyst to help bring numerous U.S.-Japan business and cultural partnerships to fruition in the New York metropolitan area.

JUNIPER knows that experience is the first and most important requirement for networking in the cloud era. We leverage our 25+ years of innovation and experience in networking to put our customers – the network architects, builders, and operators – and their customers, at the center of all that we do. With industry-leading insight, automation, security, and AI solutions we are relentlessly focused on the network experience.

QOSINA Founded in 1980, Qosina is a leading global supplier of more than 5,000 OEM single-use components to the medical and pharmaceutical industries. Qosina offers free samples, low minimums, just-in-time delivery, modification of existing molds, and new product design and development. Qosina is ISO 13485, ISO 9001, ISO 22301 and ISO 14001 certified and operates in a 95,000 square-foot, climate-controlled facility that includes an ISO Class 8 Clean Room.

STONY BROOK SMALL BUSINESS DEVELOPMENT CENTER (SBDC) The mission of the Small Business Development Center is to strengthen the small and medium size business community by providing customized business solutions through free and confidential one-on-one business advisement, education, research and advocacy for entrepreneurs and innovators.

STONY BROOK UNIVERSITY COLLEGE OF BUSINESS offers education far beyond business as usual, and strives to create leaders who have the knowledge, integrity, and originality to drive enterprise in the 21st century. Our programs entail industry projects, capstones, internships, and a true dedication to student teamwork – allowing students to build a portfolio of "real-life" accomplishments that they can take with them as part of their career experience.

STRATRGIC PARTNERSHIP FOR INDUSTRIAL RESURGENCE (SPIR) Through the resources of four State University of New York (SUNY) engineering programs, SPIR hopes to revitalize and redirect New York State industry by moving it toward an economy based on technical knowledge and the development of new technologies. The four campuses, Binghamton, Buffalo, Albany and Stony Brook, offer an engineering resource that is unparalleled in New York State.

STS GLOBAL INC. is a dynamic satellite communications telecommunications company where great engineering minds and outstanding communications experience intersect. Staffed by talented Professionals who have decades of success, STS Global is primed to deliver excellence in systems and service .

verizon

VERIZON was formed on June 30, 2000 and is one of the world's leading providers of technology, communications, information and entertainment products and services. Headquartered in New York City and with a presence around the world, Verizon generated revenues of $128.3 billion in 2020. The company offers data, video and voice services and solutions on its award-winning networks and platforms, delivering on customers' demand for mobility, reliable network connectivity, security and control.