2017 IEEE Innovation Summit in Health & Technology

Objectives/Target Audience
Technology advancement is generating new and exciting opportunities at the intersection of medicine and technology. Areas like precision medicine, eHealth, and remote medicine are moving beyond R&D to cost-effective deployment.

The IEEE Innovation Summit in Healthcare provides a forum for engineers, clinicians, healthcare providers, industry experts, regulators, municipalities, innovators, researchers and students defining clinical needs and collaboration on technology solutions for present and future healthcare challenges.

A lineup of experts and professionals will present and engage in conversations and share insights on current and future challenges and trends in this area.
2017 IEEE Innovation Summit in Health & Wellness
Technology Enablement for Healthcare (devices, applications, analytics)
2017 ComTech Innovation Summit in Health & Technology

Proposed Topical Areas:

- Global healthcare challenges, vision, roadmap to smart connected healthcare system for personalized services.
- Monitoring, diagnostics, surgical, emergency care
- Preventive and Precision Medicine
- mHealth Innovations
- Healthcare innovations: Wireless devices, systems, services
- Use of technology such as sensors, Wireless, LTE-5G, IoT, virtualization, cloud-based big data/analytics and security in delivering ecosystem solutions
- Medical and Healthcare Data Communication, Security, Privacy
- Technology & Health - Policy and Regulatory challenges

Takeaway Points:

- Understanding of some of the breakthroughs in innovation for health Diagnostics & Treatment, Tele-health, Clinical Translation, Commercialization, and Implementation.
- Understanding of rapid evolution of technology and emerging of ecosystem cloud based big data/analytics – use cases in healthcare.
- Considerations for scalable and secure networks.
2017 IEEE Innovation Summit in Health & Technology

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Advancing Technology for Humanity

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2017 IEEE Innovation Summit in Health and Technology

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Texas Advanced Computing Center
Advanced Computing Building (ACB) – New Auditorium
J.J. Pickle Research Campus, Building 205
10100 Burnet Road (R8700)
Austin, Texas 78758-4497

http://bit.ly/2uOX8Lg
2017 IEEE Innovation Summit in Health & Technology Program – Speakers

Opening & Introduction
• Dr. Dan Stanzione, Exec Dir TACC (Opening remarks)
• Dr. Guru Madhavan, Sr. Prog. Officer Health & Medicine, The National Academies of Science, Engineering and Medicine

Technology & Health - Regulatory and Policy
• Dr. Ted Lehr, Communications & Technology Management, City of Austin
• Dr. Phil Huang, MD, City of Austin Chief Medical Officer

Technology
• Dr. Eduardo Perez, Texas State University
• David Smith, President, SocialCare and CEO, Strategic Pathways
• Dr. Jennifer Davis, Sr. Managing Principal & Data Scientist for AI technologies
• Dr. Matt Vaugh, Director of TACC Life Science Computing
• Mr. Colin Tomkins, Director, Silicon Labs (next-generation biometric sensing in wearables)
• Dr. Keith Schubert, Baylor University

Medical and use cases
• Dr. William Tierney, MD and Chair of Population Health & Professor, Dell Medical School, UT Austin
• Dr. John M Uecker, MD Program Director, Dell Medical – General Surgery (Robotics) Residency
• Ms. Hope Young, President (Innovative Approach – Music Therapy & Wellness)
• Dr. Jeanetter R. Hill, Founder & CEO Spot On Sciences, Incr. (devices for blood sampling)
• Dr. Shabnam Vaezzadeh, MD Global Medical Executive, Exquisite Biomedical Consulting, San Antonio
Program Format

8:00   Registration, Coffee and networking
9:00   Opening & Introduction
9:45   Morning Keynote speakers
10:45-12:00  First Session (3 speakers)
12:00-13:00  Catered lunch
13:00  Afternoon Keynote speakers
14:00-15:15  Second Session (3 speakers)
15:15-15:45  Coffee Break
15:45-17:00  Third Session (3 speakers)
17:00  Conclusion/Adjourn
17:05 – 18:30  Poster/Demo Session / Networking Reception
Tentative Schedule

8:00  Registration, Coffee and networking
9:00  Opening & Introduction

TACC: Dr. Dan Stanzione, TACC
IEEE: Dr. Guru Madhavan, The National Academies of Sc., Eng. and Medicine

9:45  Morning Keynote speakers
Dr. Ted Lehr, Communications & Technology Management, City of Austin
Dr. Phil Huang, MD, City of Austin Chief Medical Officer

10:45-12:00  First Session (3 speakers, 25min each)
David Smith, President, SocialCare and CEO, Strategic Pathways
Dr. Keith Schubert, Baylor University
Mr. Colin Tomkins, Director, Silicon Labs (next-generation biometric sensing in wearables)

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15:45-17:00  Third Session
Dr. Matt Vaugh, Director of TACC Life Science Computing
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Dr. Shabnam Vaezzadeh, MD MD, MPA

17:00  Conclusion/Adjourn
17:05 – 18:30  Poster/Demo Session / Networking Reception
Abstract:
In this talk, I will begin by reviewing traditional planning paradigms rooted in the tenets of cost-effectiveness to guide decisions in health and health care. I will then discuss the role of and current need for more comprehensive decision support systems based on tools of systems engineering to inform choices made both by individuals and groups at large. Based on experiences from our recent work involving the development of a systems analysis platform for vaccine development, I will explore pathways to enhance the valuation of health interventions and outcomes across different policy scenarios.

Bio:
Guru Madhavan is a biomedical engineer and senior policy adviser at the National Academies of Sciences, Engineering, and Medicine. He is former vice-president of IEEE-USA and is co-editor of several academic and policy volumes. He is author of *Applied Minds: How Engineers Think* (W.W. Norton) that has been published in many countries and languages.
Topic Title: "Health Innovation from a City Public Health Perspective"

Presenter: Phil Huang, MD, MPH, Health Authority for the City of Austin and Travis County, and Medical Director for Austin Public Health

Abstract:
Attendees will hear about opportunities for applying health innovation solutions to impact the community and improve public health. The presentation will review enhanced data collection efforts for public health surveillance and evaluation, and the impact of cross-cutting innovations in clinical medical care, patient monitoring, telemedicine and other areas, which will improve population health outcomes as well as enhance public safety.

Bio:
Dr. Huang has served for nine years as the Health Authority for the City of Austin and Travis County, and the Medical Director for the Austin Public Health Department, where his responsibilities include communicable disease control, emergency preparedness, epidemiology and surveillance, immunizations, environmental health, and chronic disease prevention. Dr. Huang received his undergraduate degree in Civil Engineering from Rice University, his MD from the University of Texas Southwestern Medical School, and his Master’s in Public Health from Harvard. He served two years as an Epidemic Intelligence Service (EIS) officer with the CDC where he conducted epidemiologic studies in chronic disease and infectious disease outbreak investigations. Dr. Huang just completed a term as Chair of the Texas Medical Association Committee on Infectious Disease. He currently serves on the Capital Area Council of Government Homeland Security Task Force, and chairs their Public Health Preparedness and Response Sub-Committee. He also currently serves as Chair of the federal FDA Tobacco Products Scientific Advisory Committee, and Chair of the Texas Comprehensive Cancer Coalition (Cancer Alliance of Texas).
Topic Title: “A Sample of the Smart City Challenges and Initiatives in the City of Austin”

Presenter: Ted Lehr, IT Data Architect, Communications and Technology Management, City of Austin, Texas

Abstract:
The City of Austin has compiled an inventory of “smart city” projects: projects that include the collection, storage and analysis of data to improve operations and create opportunities. The talk will discuss just a few of the projects underway as well as some that the City would like to start but have challenges that are impeding their getting underway. The talk will conclude with some projections on timelines as well as recommendations for the audience on ways to participate in smart city efforts.

Bio:
Dr. Ted Lehr is a Data Architect with the City of Austin, Texas. He is part of Austin’s Smart City team, advising on technology, business partnerships and the use of data for better services, more open government, and development of opportunities for entrepreneurs and other private sector entities. Ted is also the staff member leading the Mayor’s Office’s White House TechHire workforce initiative, and is facilitating or participating in several university-industry-city research collaborations. Dr. Lehr lectures in Computer Science at Texas State University where, in 2015, Texas State recognized him as an Outstanding Part-Time Faculty for the quality of his teaching and research outreach. In 2017, he was designated a "Favorite Professor" by the honor students at Texas State. He has over 20 years of experience in the private sector in large and small companies. Having published over 20 refereed articles, he often speaks on conference panels regarding open data entrepreneurship, research and smart cities. Ted received his Ph.D in Electrical and Computer Engineering from Carnegie Mellon-University.
Abstract:
Patient service customization is an important new opportunity for health systems in their pursuit of better outcomes and commitment to quality and safety in their service provision process. Much like the recent expansion of product customization in industry, service customization has been expanding recently due to a variety of factors, such as technological development allowing for improved service delivery and better communication with customers. This talk will examine patient service customization and the design of systems for service customization. Starting with a review of extant work, the talk will develop a framework for patient service customization and service design, specifically, focusing on the concept of patient variability and how this concept can be used to extract greater value from the transaction between the patient and the health system. Based on the framework, the talk will then identify important directions for further research from both practice and academic viewpoints.

Bio:
Dr. Eduardo Pérez is an Assistant Professor in the Ingram School of Engineering at Texas State University. Dr. Pérez research interests are in the use of methodologies and theories in operations research, systems engineering, discrete-event simulation, algorithms and software design to solve problems in healthcare and renewable energy. Some of his research project sponsors include the National Science Foundation (NSF), Robert Wood Johnson Foundation (RWJF), Baylor Scott & White Health System, Adventist Health System, and the NEC Corporation. Dr. Eduardo Pérez is a member of the Institute of Industrial Engineers (IIE), the Institute for Operations Research and Management Sciences (INFORMS), and the Society for Computer Simulation International (SCS). He is the director of the Integrated Modeling and Optimization for Service Systems (iMOSS) research laboratory. His works have been published in multiple journals including IIE Transactions, IIE Transacions on Healthcare Systems Engineering, Simulation, Healthcare Management Sciences, and Computers and Operations Research.
Abstract:
The growth of data has accelerated beyond even the fastest forecast of a few years ago. The new definition of convergence is very different from even a decade ago. The new trends of Big Data, Data Science, Cloud, AI, Mobility and IoT are changing how organizations are using data. It is now a critical business asset. New business processes will revolve around the data and it will soon become even more intensive through massive streaming data coming from ubiquitous sensors in the Internet of Things. Variety, not volume or velocity will drive the investments. In healthcare this will be a very large change as healthcare is transformed and new data models are needed to be used. During this session you will see how the data has become a strategic business advantage and its value will only increase in the next decade.

Bio:
David Smith is a dynamic visionary, technologist and business executive. With over 30 years of experience, David combines his gifts with proprietary road mapping methodologies and systems to extract and deliver practical solutions to the world’s most complex challenges. David was named one of the seven top global futurists in the Millennium issue of Businessweek feature, “What Technology Will Be Like in 100 Years”. David has been described as a collaborative business leader who is a passionate, dynamic visionary, innovator, technologist, strategic planner, futurist and leader with a penchant for developing, inspiring and motivating teams to achieve uncommon results. Mr. Smith served on the three-person coordination committee for CSIS steering committee, SIA Technology Roadmap. He regularly presents and teaches at university, industry, and conference events. Mr. Smith held key positions at SEMATECH and the Microelectronics and Computer Technology Corporation (MCC). He is a recipient of the SEMATECH Eagle Award for the 1993 Strategic Plan and the Council of Consortia award for Extraordinary Contributions and Achievement in Technology Transfer. Mr. Smith is a senior research fellow at UT’s IC2 Institute, elected a Society for Design and Process Science Fellow, and holds a bachelor degree in Radio, Television, and Film from the University of Texas at Austin.
Topic Title: “Next Generation Biometric Sensing in Wearables”

Presenter: Dr. Colin Tompkins, Director of Applications Engineering, Silicon Labs

Abstract:
Attendees will learn considerations of adding biometric sensors to wearable hardware designs, including optical and skin temperature sensor selection, placement, signal quality, optical overlay design, fit, electrodes, and ambient light blocking considerations. The presentation will cover some of the tradeoffs for performance versus power consumption and cost of their solution. We will discuss the impact of ambient light noise on performance and optical blocking techniques. The presentation will also cover methods to reduce noise due to motion artifacts, including band design, skin contact, and use of an accelerometer to mitigate noise in the system.

Bio:
Colin Tompkins is a Director of Applications Engineering at Silicon Labs in the Internet of Things products group, where he leads an engineering team focused on developing solutions and software for sensors. After joining Silicon Labs in 1999, Colin worked in applications engineering leadership and product management roles on several of Silicon Labs’ breakthrough products, including the silicon DAA, FM radio, and voice communications products. Since 2012, he has led the sensors applications engineering team, responsible for environmental and optical sensing applications engineering. Prior to Silicon Labs, he held applications engineering positions with National Semiconductor in California and Austin, Texas. Colin is a founding officer of the Central Texas MEMS & Sensors IEEE Chapter, and holds a Bachelor of Science in Electrical Engineering from Texas A&M University.
Abstract:
Health is an information-intensive business: better healthcare, better health, and controlling costs requires access to the right data—from multiple sources—presented to the right person in the right place at the right time in the right format, the so-called “five rights of health data.” Yet most patients receive care from multiple providers and organizations whose electronic health record systems don’t talk to each other. And non-clinical health-related data can come from a wide variety of sources (e.g. local, state, and national public health agencies; federal data sources such as NOAA and the EPA; and nonprofit organizations) with varying formats and data models. Health information exchanges (HIEs) have existed for decades, although their structure and use are highly variable. Compiling data from multiple sources into a single repository for clinical, organizational, and research uses is not technically difficult. The biggest barrier is trust and its lack between competing healthcare providers and other providers of data and fear among patients and community residents that their data won't be secure. The presentation will discuss examples of successful HIEs and how worries about trust and privacy were alleviated. The presentation will then discuss plans for implementing a comprehensive HIE in Central Texas, especially strategies to engender trust among healthcare provider organizations, public agencies, and nonprofit organizations and the people and patients they serve.

Bio:
Bill Tierney is a general internist who has practiced for more than 35 years in inner-city health systems as a primary care physician, emergency physician, and hospitalist. He completed a fellowship in biomedical informatics and health services research at the Regenstrief Institute which developed one of the country’s first electronic health record (EHR) systems (in 1973) and the nation’s first HIE (in 1987) and demonstrated their value in enhancing the quality and efficiency of care while controlling costs. He also led the effort to develop the first EHR in sub-Saharan Africa which was grown into OpenMRS that to date been implemented in more than 60 countries and, along with OpenHIE, is being used to create a national EMR for Kenya, Tanzania, Uganda, Rwanda, Nigeria, Mozambique, Bangladesh, and the Philippines. In 2016, Bill became the founding Chair of the Department of Population Health at the Dell Medical School, the first medical school at a major research university in 50 years. He is a Master of the American College of Physicians, was elected to Fellowship in the American College of Medical Informatics (for which he is currently the President-elect), and was elected to the National Academy of Medicine (formerly the Institute of Medicine) in 2006.
Abstract:
Robotic surgery is revolutionizing the way that general surgery is practiced in the US. I will discuss the application of robotic surgery, the benefits to the patients, why surgeons are rapidly adapting to this new technology, and what the future of robotic surgery looks like. We will also review the technology and evolution of robotic surgery.

Bio:
John M Uecker, M.D. is Associate Professor and Program Director of General Surgery Residency Program of the general surgery residency training program at the University of Texas Dell Medical School.

Dr. Uecker has now been at University Medical Center Brackenridge for over 12 years. He developed and currently directs the surgical oncology clinic, and is an active member of the Seton Oncology Executive Committee. Dr. Uecker has moderated the multi-disciplinary adult cancer care conference at University Medical Center Brackenridge since 2007. He has implemented innovative technology into his practice of cancer patients such as laparoscopic ultrasound guided microwave ablation of liver tumors. In addition to his surgical oncology practice, he enjoys advanced laparoscopic surgery such as treating patients with hiatal hernias, gastro esophageal reflux disease, adrenal tumors, gallstones, as well as a variety of abdominal wall hernias. Dr. Uecker graduated from University of Texas Medical Branch in 1993 and then completed his general surgery training at Methodist Hospitals of Dallas. After completing his general surgery residency, he served in the Navy as the Ship Surgeon on the USS Enterprise. He lives with his wife of 22 years and two children.
Topic Title: “Movement Tracks: Moving towards greater user impact and potentials within local and global IOT ecosystem.”

Presenter: Hope Young, MT-BC, President/Owner, Center for Music Therapy,

Abstract:
Attendees will learn implications for incorporating music and users who live with disabilities when designing inclusive active mobility systems as integrated transportation and health solutions. The presentation will cover successful local and global integration of music and inclusive design into legacy technology’s and healthcare systems. It will provide examples of collaborative ways new music based IOT wearable systems are being connected to existing legacy technology’s and eco systems across private and public sectors to reach underserved and isolated communities. We will discuss the impact of repositioning legacy health systems service delivery models via IOT technology’s. The presentation will also cover methods such as music design coupled with wearable advanced predictive, precise and personalized analytics to reduce falls risks while engaging in active mobility options within an IOT Smart Ecosystem. We will also discuss the role of music to build community involvement while normalizing and improving users experience and engagement to drive better public and personal health outcomes.

Bio:
The Center for Music Therapy, Inc. is the first for-profit music therapy facility in the world specifically designed to research and treat neurologic movement conditions and disorders through music. It was founded in 1990 to make music therapy more accessible. Ms. Young is a leading global innovator and driving force behind the concept and development merging music and biotechnologies as a health and mobility solution. In 2017 she toured both Europe and Asia, as well as spoke at SXSW and she was recognized in publications such as The Journal of the American Medical Association, The Wall Street Report, and New York Times Bestseller: The Mozart Effect. Young graduated from The University of the Pacific, Conservatory of Music in 1989 with a degree in music therapy. She received The Young Outstanding Alumni, honored with the Harmony Award for clinical practice and was a 2017 recipient of the (IHA) Intelligent Health Award for her research, patents and her Movement Tracks Projects. Ms Young is active in Texas Chapter and National Grammy activities as a member of the National Academy of the Recording Arts and Sciences. (ACUP) Austin’s Smart City Consortium and (HIMMS) Healthcare Information and Management Systems Society.
Abstract:
Most healthcare decisions are based on diagnostic testing, but access to blood tests are limited, especially for vulnerable populations such as elderly, rural and homebound. We will discuss a simple, convenient and cost-effective method for collecting a blood sample at home by finger stick and “moving the sample” to a lab to improve access to testing. The presentation will also cover current drivers for innovation in healthcare to provide consumer-centric and precision medicine for an aging population.

Bio:
Dr. Jeanette Hill is the founder and CEO of Spot On Sciences Inc., which develops medical devices to allow a blood sample to be taken at home with a finger stick. She has > 20 years experience in research and management positions in small and large biotech companies, developing products for preclinical drug testing. She received a Ph.D. in Bio-organic Chemistry at Washington University in St. Louis with research in protein engineering and completed post-doctoral research on liver disease and diabetes at Case Western Reserve University and Washington University Medical School. Spot On Sciences (www.SpotOnSciences.com) has been awarded grants from DARPA, NIH and Gates Foundation and has won many innovation and business awards including RISE Global pitch winner, 1776 Challenge, SXSW Accelerator, Astia Global winner, Austin A-List Hottest Start-ups, Get In the Ring N.A. winner, and White House Demo Day.
Abstract:
Effective market introduction (commercialization) is essential to long-term success of innovative therapies. Scientists, health care professionals, payers, regulatory agencies, and life sciences companies ideally work hand in hand to successfully develop and transition new therapies into the market place for the benefit of the patients. The groundwork for commercialization should be laid early on. Adoption of new therapies often requires a shift in standard of care. The shift can best be achieved by early involvement of respected healthcare professionals, and development of key opinion leaders who educate, advise, research, publish, and lobby on behalf of the new product. The due diligence process of a technology includes review of its safety, clinical validity, published evidence, product champion plans, commercial viability. A well-rounded plan in motion will demonstrate that the technology is poised for success once commercialized, making its acquisition more appealing to established commercial entities who have the means for full commercialization.

3 key takeaways:
• The role of Medical Affairs in support of new medical technologies
• Collaboration of industry with healthcare professionals
• Transition of technologies from startups to the large corporation

Bio:
Shabnam Vaezzadeh, MD, MPA, offers more than 17 years of experience in the life sciences industry in areas of Medical Affairs strategy and execution, Product Safety and Pharmacovigilance, Clinical Affairs, and Business Development. She currently serves as a consultant to several biomedical companies. As the VP of Global Medical Affairs for KCI and Acelity, Shabnam led a global matrixed team of Medical Education, Medical Information and Publication, Professional Affairs, and Global Safety professionals. As part of her responsibilities for Product Safety both in LifeScan, Inc., Johnson and Johnson, and KCI, Shabnam provided medical input into new product development projects, contributed to risk management of products throughout the lifecycle, instituted safety databases, interfaced with FDA during FDA audits, and oversaw a 24/7 clinical safety hotline. Dr. Vaezzadeh holds an MD from Tehran University of Medical Sciences, Iran, and a Master’s in Public Administration with focus on HealthCare Administration from University of San Francisco, CA.
2017 IEEE Innovation Summit in Health & Technology

Registration
The registration is by invitation and is FREE for a capacity of 150 seats

https://2017-ieee-innovation-summit.eventbrite.com

Event Cost
The event is hosted by TACC and cost is covered by IEEE Societies, chapters and supporters: IEEE Communications, IEEE CEDA, IEEE Central Texas, IEEE Standards Association, IEEE Austin chapters: ComSoc & Signal Processing, EMBS, Computer and CEDA; Austin Chamber of Commerce, ACUP, and Westwood HS Health & Science Advisory Board

Auditorium & A/V, reception area, registration
• Supported by TACC

Parking support by IEEE Austin EMBS/CS Austin joint chapters

Lunch for participants
• Supported by CEDA

Coffee breaks
• Supported by IEEE ComSoc

Reception plus F&B
• Supported from IEEE USA, IEEE CTS and and others
2017 IEEE Innovation Summit in Health & Technology

Organizers

**Advisory Board:**
Dr. Dan Stanzione, Dr. William Tierney, Dr. Sani Nassif, Leslie Martinich, Fawzi Behmann

**Overall Program:**
Fawzi Behmann

**Technical Program Content**
Dr. Sani Nassif, Matt Vaugh, E Shahhaidar (Sunny)

**Local Arrangement:**
TACC: Valerie Wise
IEEE: Bill Martino

**Finance:**
Kai Wong

**Website & Social Media:**
Adolfo Rafael Martinez, Norma Antunano and

**Student Volunteers:**
Westwood HS Health & Science Ambassadors