

## BHI 2016 International Conference on Biomedical and Health Informatics

### Session Title: “Too Much Data Too Little Time: Pressures, Practice and Possibilities for Use of Big-Data Strategies and Analytics in Healthcare

#### Participants

Marvin J. Slepian MD – *IEEE Member*  
Fuad Rahman PhD  
Akhsar Kharebov  
Matt Sarrel  
Syed Hossainy PhD

#### Background and Topics:

Healthcare in the United States and worldwide is under increasing pressures - financial, population and disease-burden. Further, we are living in a world of shifting medical paradigms, with care shifting from a traditional, large population, one-size-fits-all approach to a focus on personalized individual care. On top of this the amount and type of medical information that health care providers are dealing with – i.e. history and physical information, labs, imaging, and other digital and analog input signals – e.g. ECG, is voluminous, varied and of differing structure and format. This is the essence of Big Data – *volume, variety, veracity and velocity*. Thus, the doctor typically has the increasing burden of rising patient number coupled with progressively less time to spend with each patient. So we are dealing with more patients, more data, and less time.

With the advent of great strides in data collection devices, able to capture a host of data modalities, coupled with our ability to process huge amounts of data, we are now at the precipice of a healthcare revolution. Data has always been king, but collecting this data and processing it was computationally impossible until very recently. Not only has the quantity of data increased exponentially, but the type and nature of this data has also dramatically evolved. All this has made the need for efficient and effective Big-Data processing platforms a necessity.

In this Invited Session, we will address the stresses and burdens facing health care. We will then address the issues and opportunities with regard to collection, processing, storage, and eventual exploitation of healthcare data for making healthcare systems more efficient. An interdisciplinary group of domain expert speakers has been assembled to provide a range of perspectives so as to offer insight, focus and potential solutions to this critical area for healthcare.

#### Speakers and Talk Titles

**A. Marvin J. Slepian MD**, Professor of Medicine, Professor and Associate Department Head BioMedical Engineering, McGuire Scholar, Eller College of Management, Director, ACABI – Arizona Center for Accelerated BioMedical Innovation, University of Arizona, [chairman.syns@gmail.com](mailto:chairman.syns@gmail.com)

#### ***Title: HealthCare in Evolution: Needs, Opportunities and Technologies***

Addresses the stresses facing the healthcare system, the change in practice patterns and focus as well as the deluge of data in modern healthcare systems. Problems and opportunities will be discussed and highlighted from the perspective of big data systems and emerging input/wearable technologies.

**B. Fuad Rahman PhD**, CTO, Tellit Health Inc. fuad@tellithealth.com

***Title: Big-Data: State –of-the-Art***

Addresses the current state of the art of big data technology – positives and negatives and presents some successful systems in use in other fields such as financial data processing.

**C. Akhsar Kharebov** - Chief Evangelist (Validic)

***Title: Organizing the universe of mobile health data and making it actionable***

Addresses the current focus on data gathering via wearable devices and other small-scale devices and how that has changed the healthcare domain.

**D. Matt Sarrel**, Executive Director, Sarrel Group

***Title: Big Data – Still in the Workshop - What is everyone working on?***

Addresses current big-data efforts in the research and development stages.

**E. Syed Hossiany PhD**, Senior Director of Research and Volwiler Fellow at Abbott Vascular

***Title: Opportunities and Challenges in Defining a Big-Data Effort in Healthcare***

Address how larger pharmaceutical, medical devices and companies in related areas are looking at proposed Big-data solutions as the next frontier in healthcare.

## Short Bios of the Invited Speakers

### Marvin J. Slepian MD



Marvin J. Slepian, MD is Professor of Medicine and Professor and Associate Department Head of BioMedical Engineering, as well as a McGuire Scholar in the Eller College of Management, all at the University of Arizona. Dr. Slepian is also the Director of the Arizona Center for Accelerated BioMedical Innovation (ACABI), a university-wide entity which is a “creativity engine,” leading to new solution development for unmet needs. On the clinical level he is presently Director of Interventional Cardiology at the Sarver Heart Center in which he also directs the Tissue Engineering Laboratory. Dr. Slepian is also an Adjunct Professor in BioMedical Engineering at StonyBrook and Rutgers University. In Addition, Dr. Slepian is founder of SynCardia Systems Inc. (Total Artificial heart) where he serves as Chief Medical and Scientific Officer, having been CEO (5yrs) and Chairman (12 yrs).

Dr. Slepian received his A.B. degree in Biochemical Sciences from Princeton in 1977 and his MD from the University of Cincinnati in 1981, where he was elected to AOA. He completed his internship and residency in Internal Medicine at NYU-Bellevue where he also served as Chief Resident. He trained in Cardiology at Johns Hopkins, completing a clinical and research fellowship. He subsequently received additional subspecialty training in Interventional Cardiology at The Cleveland Clinic. Dr. Slepian also received post-doctoral training in Chemical Engineering and Polymer Chemistry at MIT and Washington University as well as Business training at Harvard Business School.

In parallel with his clinical career Dr. Slepian has had a synergistic career in basic and translational research and technology transfer. At the basic level his laboratory has concentrated on three main areas: 1. the role of cell-matrix interactions in vascular disease and 2. the utility of polymeric biomaterials to modulate these interactions as well as serve as novel therapeutic structural, barrier or drug delivery materials and 3. the impact of physical forces (notably shear) on platelet activation. On the translational level his lab has developed many novel therapeutic solutions based on polymeric biomaterials which have found their way into clinical use today including: drug eluting stent technologies, stent coatings, "polymer paving," surgical anti-adhesive barriers, synthetic tissue sealants, myocardial revascularization and cell delivery methods and cardiovascular prosthetic devices, including the total artificial heart. As to technology transfer Dr Slepian has founded several medical device companies as spin-outs including Focal (NASDAQ), Endotex, Angiotrax, Hansen Medical (NASDAQ), Arsenal, 480 BioMedical, MC10 and SynCardia and has been involved with bringing many new devices through the FDA regulatory process into clinical use, including most notably the total artificial heart. He has received multiple awards for his academic and translational research activities including election as a fellow of the American Institute for Medical and Biological Engineering and is the current President of the International Society for Rotary Blood Pumps.

#### **Fuad Rahman PhD, CTO Tellit Health Inc.**



Fuad Rahman, Ph.D., is a computer scientist and entrepreneur with extensive background in building companies in the area of software technology. He is the CTO of Tellit Health, a company that is changing the way doctors and medical practitioners view patient records. Tellit is building a next generation platform that reveals the story hidden in each patient's medical records and produces an individualized narrative relevant to the clinical decision at hand.

He was the Founder of Apurba Technologies Inc., a technology based software IP Company. Apurba specializes in building software - specifically in healthcare, regulatory compliance, data mining and large data analytics.

Before founding Apurba, Dr. Rahman was the Vice President of Product Development at KnewCo, a leader in semantics based knowledge discovery and In-Text advertising solutions. Before that, Dr. Rahman worked as the Research Team Lead at QuickSchools Inc., a leading innovator of cloud-based agile SaaS development platforms, where he was responsible for creating the product vision, identifying critical priorities and establishing a

customer-facing platform for its rapidly growing product set. Prior to that, he was a Research Lead / Product Manager at BCL Technologies Inc., where he led the R&D team, successfully wrote and won grants from US Army, Navy and Air Force on topics related to NLP, information retrieval, text mining and summarization. He has also served as an Algorithm Lead at Handisplay Inc., leading cutting-edge research projects focusing on core algorithm development that has commercial applications in document layout analysis, web page analysis, web page clustering and semantic clustering of free format natural language. Early in his career, he designed algorithms for mapping web page content to cell phone browsers at WiredPocket Inc. as a Research Engineer.

Dr. Rahman has published widely in the scientific journals. His published body of work comprises of over 80 technical peer reviewed articles in the scientific literature including 6 book chapters and 24 journal papers. He has worked on the editorial boards of technical journals, acted as referee to many journals and worked as technical committee member in many international conferences.

### Syed Hossainy PhD



Dr. Syed Hossainy is the Senior Director of Research and Volwiler Fellow at Abbott Vascular. He has been the Head of an innovation incubator group (operating budget ~ \$4.5 MM /yr) with a vision of “Targeted innovation optimizing short-term and long-term business growth options”.

Dr. Hossainy has developed a substantial track record of creating IP and developing it to commercial products. He has over 280 issued patents, over 350 patents pending (listed in USPTO) in the area of cardiovascular implants, drug delivery, and Biomaterials application.

I have also been very active in disseminating my research. He has delivered over 20 Invited lectures at world congresses and over 75 additional podium and poster presentations. He also has over 15 peer-reviewed journal publications.

Since 2014, Dr. Hossainy was awarded an Adjunct Professor position at UC Berkeley at the Department of Bioengineering. He has been a Research Fellow at the Institute of Computational Engineering and Sciences (ICES) since 2006 and been a Research Affiliate at the Harvard-MIT Biomedical Engineering Center since 2002. Dr. Hossainy received his Ph.D in Chemical Engineering from the University of Texas-Austin.

### Akhsar Kharebov - Chief Evangelist (Validic)



Akhsar Kharebov is an engineer-turned-entrepreneur innovating in health. Over the years he has built products and companies in web, mobile, social and now health. He is passionate about innovation and entrepreneurial culture.

He has a track record for taking ideas from concept to launch, helping startups with innovative technology, exploring new models, and building new ecosystems. Day to day he is the Chief

Evangelist at Validic - organizing the universe of mobile health data, and making it actionable.

He is also the founder and chair of the SVHealth.co - the largest community of digital health innovators on the West Coast. He serves as an advisor to a few health tech startups including DoctorBase.com (now part of Kareo).

### **Matt Sarrel, Executive Director, Sarrel Group**



Matt Sarrel has over 20 years of experience implementing and evaluating network and information security solutions. He is currently running Sarrel Group, a technical marketing professional services firm. Every technology business needs to know how they stack up against the competition, and more importantly how to beat the competition. Matt is a professional writer, writing for GigaOm, eWeek, PC Magazine, Backyard, Allbusiness.com, TopTechDog.com and more. Mr. Sarrel has earned a BA (History) from Cornell University, an MPH (Epidemiology) from Columbia University, and is also a Certified Information Systems Security Professional (CISSP).