MEMS & Sensors Industry Group

SenSIP INDUSTRY CONSORTIUM

ASU

TECNOLÓGICO DE MONTERREY

Call for Participation:
Sensors & Machine Learning for IoT, Health & Security Applications

Presentations, Panel, Posters; Training Short Course: Machine Learning for Sensors

Industry-University Event, **November 9, 2016**

Hilton Scottsdale Resort & Villas
6333 North Scottsdale Road,
Scottsdale, Arizona, 85250-5428, USA

Sponsored in part by NSF International Programs, the NSF I/UCRC program and the ASU SenSIP Center. Technical Co-Sponsor: IEEE Phoenix SPCOM Chapter
Register at **http://sensmach.asu.edu**

Organized by ASU and ITESM In Collaboration with the MEMS & Sensors Industry Group

IEEE NSF

The SENS|MACH workshop is held in collaboration with the:

***MEMS & Sensors Executive Congress (MSEC 2016)*.**

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Sensors & Machine Learning Workshop - Preliminary Program, Nov. 9, 2016

Morning Session Chair: Mike Stanley, NXP

7:30am	Registration / Breakfast
7:50am	*Welcome Remarks, Betsy Cantwell, ASU VP Research. (10 min)*
8:00am	*Plenary Session, Function Safety and Security for Sensors and IoT, Ian Chen,Manager, NXP (30 min)*
8:30 am	*Sensors, IoT, and Smart Campuses: Challenges & Opportunities, Gordon Wishon, ASU CIO. (15 min)*
8:45 am	*From 5G wireless communication to the 4th Industrial revolution, Byung. K. Yi, CTO InterDigital. (15 min)*
9:00 am	*Smart Cities, Joe Gilman, Regional Manager, Sprint. (15 min)*
9:15 am	*Radio Planning for Wireless Sensor Network Design Using 3D Ray Launching, Cesar Vargas, CoSIP Center Director, ITESM (15min)*
9:30 am	*The Sensor Collaborative: Enabling Healthcare IoT solutions, Anthony Bajoras, Development Advisor, Partnership for Economic Innovation (PEI) (15min)*
9:45 am	*Activities of the MEMS and Sensors Industry Group, Stephen Whalley, CSO, MSIG. (15min)*
10:00 am	*Coffee Break*
10:30 am	*Info on SenSIP and Membership, Andreas Spanias, ASU SenSIP (10 min)*
10:40 am	*Beyond Just Sensing, Claire Jackoski, Intel (15min)*
11:00 am	***Industry-ASU Panel:*** **Key business and technology disrupters for the next decade of ubiquitous sensing;** *(NXP, Intel, Algorithmic Intuition, Sprint, InterDigital, ASU) (60 min including questions) Facilitator/ Coordinator: Stephen Whalley*
12:00 pm	*Lunch (1 hour)*

Afternoon Session Chair, Cesar Vargas, Tech de Monterrey

1:00 pm	*Sensors and Machine Learning: Driving Advanced Applications, Kevin Shaw, CTO, Algorithmic Intuition (15min)*
1:15 pm	*Using Data Science to Feed the Growing Population - Challenges and Opportunities, Karthikeyan Rammurthy, Research Staff Member, IBM TJ Watson research. (15 min)*
1:30 pm	*Sensors and Humans in Networking Environments: A People-First Approach to the Internet of Things, Lauren Withycombe Keeler, Prof., ASU School for the Future of Innovation in Society. (15min)*
1:45 pm	*Opening the Doors to Artificial Intelligence Using Deep Learning Networks, Jayarmanan Thiagarajan, Research Computer Scientist, Lawrence Livermore Laboratory.*
2:00 pm	*Position Location Information (PLI), Rafaela Villalpando Hernández, Professor, ITESM (15min)*
2:15 pm	*Machine Learning and Vision Problems and Security Applications, Henry Braun, ASU SenSIP*
2:30 pm	*Coffee Break*
3:00 pm	***Short Course*** *Machine Learning Primer for Industry Managers and Engineers (90 minutes) Spanias, Shanthamallu, Stanley*
5:00 pm	*Summary of Session (All) / Final Remarks (15 min)*

LIMITED SPACE - REGISTRATION REQUIRED: >>> ***REGISTER by Clicking HERE***

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Betsy Cantwell,
ASU VP Research

Stephen Whalley,
Chief Strategy Officer MSIG

Gordon Wishon,
Chief Information Officer, ASU

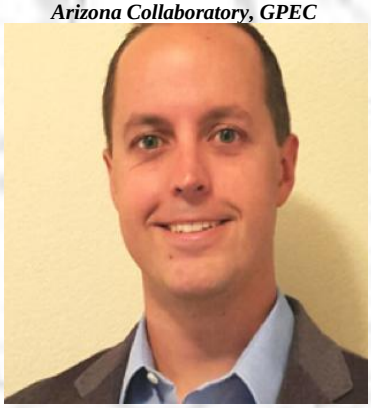
Ian Chen,
Senior Manager NXP

Anthony Bajoras, Board Member
Arizona Collaboratory, GPEC

Claire Jackoski,
Strategic Planer Intel

Mike Stanley, NXP,
Systems Manager

B.K.Yi, InterDigital,
CTO



Joseph Gilman,
Regional Manager, Sprint

Jayaraman Thiagarajan, Computer
Scientist, Lawrence Livermore Lab

Cesar Vargas, Prof..
CoSIP Center Director, ITESM

Andreas Spanias,
ASU Professor, Director SenSIP

Kevin Shaw, Chief Technology Officer,
Algorithmic Intuition

Lauren Withycombe Keeler, ASU
Research Prof., Social Implications

Karthikeyan Ramamurthy, Research
Staff, IBM TJ Watson

Rafaela Villalpando Hernández,
Professor ITESM

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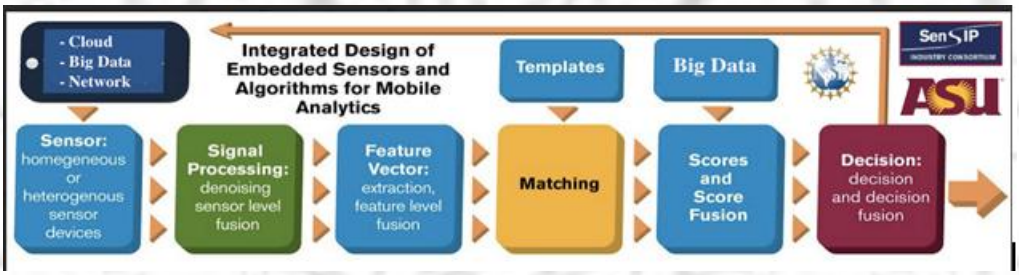
Short Course: A Primer on Machine Learning for Engineers and Managers

Description of Course: This tutorial provides an introduction to the principles and applications of machine learning algorithms, software and applications. The tutorial begins with an introduction to the basics of pattern matching, feature extraction, and supervised and unsupervised learning. The tutorial then covers basic methods such as the k-means, support vector machines, neural nets and deep learning. The coverage is at a t high level for beginners featuring functional block diagrams, qualitative descriptions, and software examples. The course connects algorithms with sensor applications including health monitorin, IoT, and security applications.

Topics: Qualitative Overview, what is machine learning?, Use in Sensors and Big Data, Algorithms and Software, Begings from Vector Quantization and Cell Phones, Feature Extraction, K-means, Adaptive Neural Nets, Support Vector Machines, Bayesian Methods, Deep Learning, Embedding machine learning on sensor boards, Applications; IoT, health monitoring, security; smart campus, smart cities; social implications

Who Should Attend: The tutorial is designed for students, engineers and managers who need to understand the basics of machine learning and their utility in various sensor applications. The tutorial should be of particular interest to engineers and managers who need to prepare for projects that involve learning algorithms for sensors.



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Key business and technology disrupters for the next decade of ubiquitous sensing

Ian Chen – Sensor Manager, NXP

Joe Gilman - Branch Manager, Mountain Southwest Region, Sprint

Claire Jackoski – Strategic Planning, Client Planning and Architecture, Intel

Kevin Shaw - CTO & Co-Founder, Algorithmic Intuition

Byung K. Yi - Executive Vice President & Chief Technology Officer

Stephen Whalley - CSO, MEMS & Sensors Industry Group

SENSMACH 2016 Panel Description
Coordinator: Stephen Whalley

This panel of industry and academic visionaries will discuss disruptive sensing technologies happening today and provide insights on what disrupters we can expect and need to see in the coming years. This will cover applications, user experience, hardware, algorithms, data analytics, services and more that will impact the sensing landscape dramatically. The panelists will give you their top three things that we should all be paying attention to if you are building sensor solutions.

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POSTERS SENS|MACH 2016

Poster 1 Optical Flow for Compressive Sensing Video Reconstruction, H. Braun
Poster 2 Direct Tracking from Compressive Imagers: A Proof of Concept, H. Braun
Poster 3 Direction of Arrival Detection Problem Using Virtual Array Concepts, Y. Rong
Poster 4 Empirical Bounds on Machine Learning Performance: Applications to Pathological Speech Processing, A. Wisler
Poster 5 Minimally Supervised Machine Learning for Condition Monitoring of Machinery, J. Lee
Poster 6 Integrating Machine Learning to Embedded Sensor Systems for Distributed Internet-of-Things Applications, J. Lee
Poster 7 Cross Platform Sensor System Monitoring for Solar Array Analytics, D. Ramirez
Poster 8 Irradiance Estimation for a Smart PV Array, H. Braun
Poster 9 Human Activity Recognition with Smartphone Sensors, H. Song
Poster 10 Maximum Likelihood Channel Estimation for Residual Self-Interference Cancellation in Full Duplex Relays, X. Li
Poster 11 Dynamic Scheduling for Delay Guarantees for Heterogeneous Cognitive Radio Users, A. Ewaisha
Poster 12 Max-Consensus Using the Soft Maximum, S. Zhang
Poster 13 Development of Mobile Sensing Apps for DSP Applications, D. Rajan
Poster 14 iJDSP: iOS Signal Processing Laboratory for the iPod Touch, iPhone and iPad, S. Hu
Poster 15 Digital Signal Processing Algorithms for Silicon Ion-Channel Sensors, A. Spanias
Poster 16 SenSIP – ITESM Global Engagement Projects, C. Vargas
Poster 17 Feature Fusion in Machine Learning Problems, H. Song
Poster 18 Musical Query-By-Humming Search: Analysis and Implementation of the State of the Art, D. Ramirez
Poster 19 A Robust Adaptive Beamforming Method with Quiescent Pattern Control, J. Fan
Poster 20 Aim of Fault Detection using Research Facility containing 104, 18kW, Solar Array Panels, S. Rao
Poster 21 Health Monitoring DSP apps, U. Shankar
Poster 22 Sequential Utility Maximization for Dynamic Spectrum Access, L. Ferrari
Poster 23 Echolocation Based Ranging and Spatial Acoustic Analysis. M. Banavar (Clarkson University)
Poster 24 Using estimation theory to improve energy expenditure estimation of physical activities from wearable sensors, Q. Wang
Poster 25 Monitoring Physiological Signals Using Camera, F. Tsow (Earthlink)

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VENUE

HILTON SCOTTSDALE RESORT & VILLAS

6333 North Scottsdale Road, Scottsdale, Arizona, 85250-5428, USA

Meeting Room

Map

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Organizing Committee

Andreas Spanias, ASU SenSIP
Stephen Whalley, MEMS and Sensors Industry Group
Mike Stanley, NXP
Cesar Vargas – Rosales, Tec de Monterrey

Volunteers

Jongming Lee
Henry Braun
David Ramirez
Sai Zhang
Uday Shankar Shanthamallu

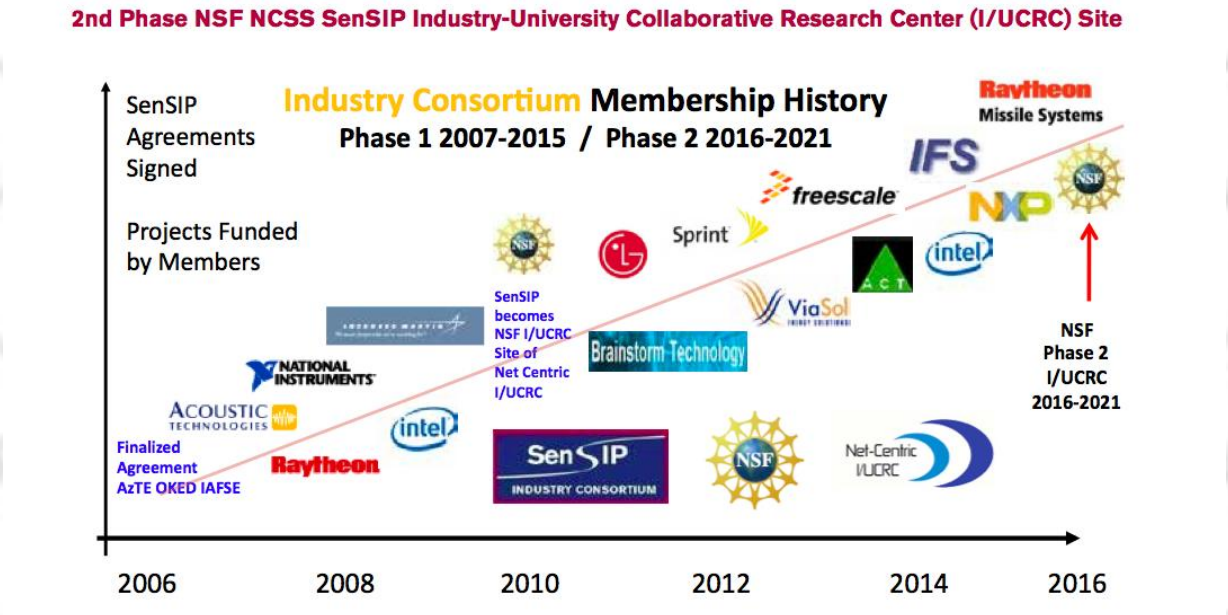
Technical Co-Sponsors

SenSIP, IEEE SPCOM Chapter, NSF International Programs

Participating Organizations and Companies

MEMS & Sensors Industry Group, General Dynamics,
NXP, IBM Research, Intel, Poundra, Sprint, Lawrence Livermore, Raytheon, ASU UTO
ASU OKED, ASU Biodesign Institute, ASU IAFSE

Main Organizing Center: ASU SenSIP I/UCRC:



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