Industry-University Workshop on **Sensors and Machine Learning**

SENS|MACH 2017

WHERE SENSORS AND ALGORITHMS COME TOGETHER

October 31, 2017

Learn the Latest on Hardware and Algorithms for Sensor Systems and Applications

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

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

Industry-University Event, October 31, 2017

DOLCE HOTELS AND RESORTS HAYES MANSION

Hayes Mansion
200 Edenvale Avenue
San Jose, CA 95136
Local (408) 226-3200

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

SenSIP INDUSTRY CONSORTIUM

ASU

sensmach.asu.edu

PROGRAM

Presentations – Details Coming Soon

Panel on Sensor & Machine Learning Applications

Networking

Primer on Machine Learning

Student Posters

SENS|MACH 2017 - Preliminary Program - Hayes Mansion, San Jose

Registration 8:30 am.

- 9:00 am Opening Remarks, ASU VP
- Implementation of Efficient, Low Power Deep Neural Networks on Next-Generation Intel Client Platforms, Mike Deisher, Principal Engineer, Intel
- What's in store for optical sensing? Ian Chen, Maxim Integrated, Industrial and IoT Sensors Business Manager, Software Architect
- Trending Always-On Sensor Use Cases, Vinu Godavarti, Intel

10:00 am Coffee Break

- Blockchain of Food and sensing requirements, Raja Ramachandran, CEO of Ripe
- State of the SenSIP Center, Membership Drive, A. Spanias, Director NSF SenSIP I/UCRC
- Deep Learning in Image Understanding, Jayaraman Thiagarajan, Lawrence Livermore National Labs
- SenSIP Center Industry Projects, Andreas Spanias

12 PM Lunch

- Advancing Sensor Solutions with Machine Learning, Panel Session headed by Steve Whalley, Consultant on Sensors
- Karthikeyan Ramamurthy, TBD, IBM TJ Watson
- Optimizing Massive MIMO for 5G, Cesar Vargas, ITESM
- Parametric Position Location using Doppler, Rafaela Villalpando Hernandez,ITESM

3:00 PM Coffee Break

Short Course: Primer in Sensors and Machine Learning, A. Spanias, M. Stanley, U. Shankar,

Poster Session

ASU SenSIP Research Posters

- Optical Flow for Compressive Sensing Video Reconstruction for Defense Applications, H. Braun
- Integrating Machine Learning to Embedded Sensor Systems for Distributed Internet-of-Things Applications, J. Lee
- Nanopore Sensors and Signal Processing, M. Bowers
- Mobile Applications for Health Monitoring, C. Snyder,
- Photoplethysmogram Sensor Array, C. Jenkins
- Development of a CO2 Analyzer for Health Monitoring, R. Ramirez
- Fluorescent-based lateral flow point of care detection of cervical cancer biomarkers in serum, M. Zhu
- Managing Respiratory Disease with Wearable Devices, N. Sharma
- Physiological Monitoring for Childhood Asthma, S. Martinez
- Crowd Sourced Environmental Monitoring, B. Ausby
- Exercise Routine Optimization Via Sensor Fusion, F. Khondoker
- Human Activity Recognition with Smartphone Sensors, H. Song
- Max-Consensus Using the Soft Maximum for Sensor Networks, S. Zhang
- Development of Mobile Sensing Apps for DSP Applications, J. Fan
- Digital Signal Processing Algorithms for Silicon Ion-Channel Sensors, M. Goryll
- SenSIP – ITESM Global Engagement Projects, C. Vargas
- Deep Learning Feature Fusion in Snesor and Machine Learning Problems, H. Song
- A Robust Adaptive Beamforming Method with Quiescent Pattern Control in Sensor Arrays, J. Fan
- Health Monitoring DSP apps, U. Shankar
- Echolocation Based Ranging and Spatial Acoustic Analysis. M. Banavar (Clarkson University)
- Using estimation theory to improve energy expenditure estimation of physical activities from wearable sensors, Q. Wang

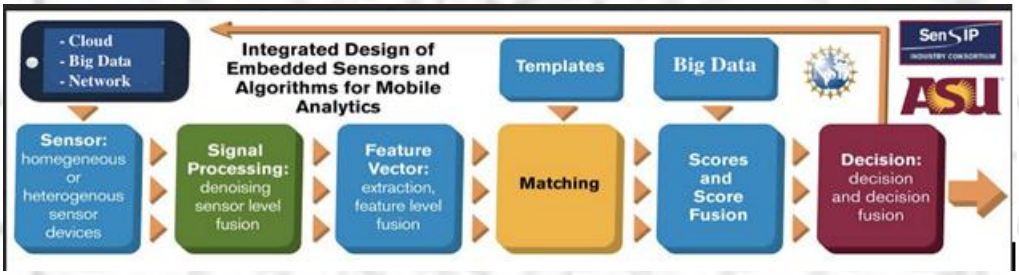
5:00 pm Adjourn

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

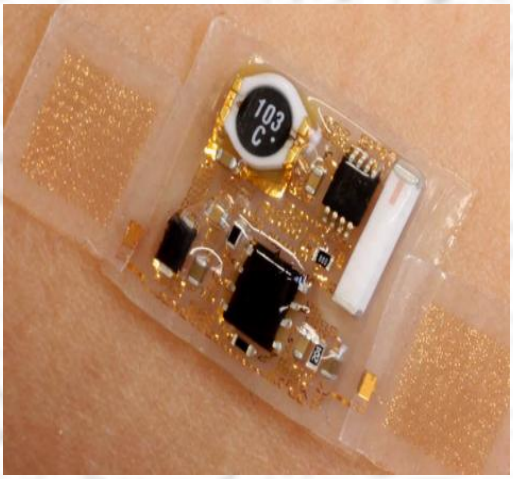
Description of Course: This tutorial provides an introduction to the principles and applications of machine learning algorithms, software and applications. The tutorial begins with an introduction to the basics of pattern matching, feature extraction, and supervised and unsupervised learning. The lecture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

Topics: Qualitative Overview, What is machine learning?, Use in Sensors and Big Data, Algorithms and Software, Beginings 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, software tools

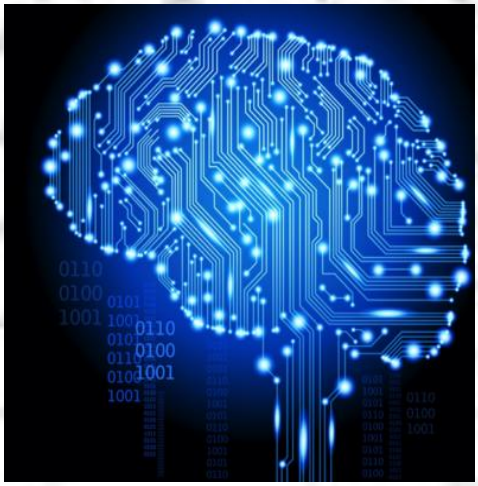
Who Should Attend: The tutorial is designed for students, engineers and managers who need to understand the basics of machine learning and their utility in various sensor applications. The tutorial should be of particular interest to engineers and managers who need to prepare for projects that involve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



Sensors



Machine Learning



IoT

VENUE

DOLCE HAYES MANSION - HOTEL & RESORT

200 Edenvale Ave,San Jose, CA 95136
https://www.hayesmansion.com/

Meeting Room

Amenities

Organizing Committee

Andreas Spanias, ASU SenSIP
Cesar Vargas – Rosales, ITESM
Stephen Whalley, Consultant
Mike Stanley, NXP
Jayaraman Thiagarajan, Lawrence Livermore Labs

Volunteers

SenSIP Center Students

Sam Katoch
Uday Shankar
Huan Song
Jie Fan
Sunil Rao

Technical Co-Sponsors

SenSIP, IEEE SPCOM Chapter, NSF I/UCRC & International Programs

Main Organizing Center: ASU SenSIP I/UCRC: