Boston/Newton Agenda

	Session 1	Session 2	Session 3	Hands-on Training
9:30 – 10:10	LoRa™ enabling low-power, wide-area networks (LPWANs) required for IoT applications	IoT Security by Design *Sponsor session: Electric Imp Sponsor Session*	BLDC motor drive and control (9:30 – 11:00)	ST SensorTile and IBM Watson Hands-On Workshop (9:30 – 11:30)
10:20 – 11:00	Optimizing Low Power in Embedded Designs Using STM32L4 Microcontrollers	Platform Level Security For IoT Devices		
11:10 –12:00	Understanding Bluetooth® Low Energy	Integrating Strong Security Elements into your IoT Device Design *Global Sign Sponsor Session*	Motor Driver solutions for ultra-low voltage applications	
12:00 - 1:00	Lunch	Lunch	Lunch	Lunch
1:00 – 1:40	Low Power microphone acquisition and processing for always-on applications	Introduction to ST's Time of Flight Technology: FlightSense	Robust design with major power discrete technologies	STM32 Nucleo Pack for IoT Hands-On Training: Simplifying Microsoft Azure IoT Suite Connectivity for Embedded Devices (1:00 – 4:00)
1:50 – 2:30	Open standards for managing sensor/actuator devices in IoT	NFC readers: easy implementation in challenging environments	AC/DC Power Conversion	
2:40 – 3:20	MEMS Micro-actuators	NFC of Things	USB Type-C & PD	
3:30 – 4:10	Pressure sensor tech enabling consumer, industrial & medical applications	Baluns & Protection	SiC MOSFET benefits	
4:20 – 5:00	THELMA Technology platforms at the heart of MEMS sensing technology	ThingSpace by Verizon: Delivering on the Promise of IoT *Verizon Sponsor Session*	Wireless Charging	Solve connectivity challenges with SigFox (4:20 – 5:30)

Session topic: ■ Smart Sensors ■ Security ■ Connectivity/Big Data ■ Power ■ Motor Control

Session 1 Abstracts

LoRa™ enabling low-power, wide-area networks (LPWANs) required for Internet of Things applications
Speaker: Nicolas Fillon, STMicroelectronics

LoRa enables long-range communication with advantages over conventional cellular connections, including lower power and cost. Versatile features include multiple communication modes, indoor and outdoor location awareness, and native AES-128 security. This session will give an overview of LoRa technology, examine use cases where LoRa is a good fit and look at a low-cost development kit for prototyping IoT devices with LoRa™ Wireless Low-Power Wide Area Network (LPWAN) connectivity.

Optimizing Low Power in Embedded Designs Using STM32L4 Microcontrollers
Speaker: Guillaume Legrain, STMicroelectronics

Concerned about low power in your next embedded design? Having difficulties designing a low power application where high performance is required? This session presents an overview of our STM32L4 Series ultra-low power microcontrollers and how they can help solve your low power needs without sacrificing performance for your next embedded design. We will review common low power terminology and how it applies to your application as well as key benchmarks used to measure power versus performance. We will demonstrate how to achieve 42uA/MHz with the SM32L4 using the SMPS configuration and you will learn how to get started using the STM32L4 in your next design.

Understanding Bluetooth® Low Energy
Speaker: Hary Radakichenane, STMicroelectronics

This class will talk about Bluetooth evolution over the years and focus on the key challenges a developer has to face when designing a Bluetooth Low-Energy (BLE) IoT node. The class will be organized in Labs that will touch power consumption estimation of the node, how to enhance application throughput, how to transmit voice over BLE and how to create a robust over the air firmware upgrade. During the class you will learn from our BLE engineers.

Low Power microphone acquisition and processing for always-on applications
Speaker: Luca Spelgatti, STMicroelectronics

This session will focus on the tradeoff between performance and low power consumption in embedded IoT platforms used for always on microphone acquisition.
It will show different system architectures based on Cortex-M microcontrollers, with one microphone acquisition and processing depending on the power budget and overall system performance, targeting always on microphone acquisition as input for automatic speech recognition algorithms.

Open standards for managing sensor/ actuator devices in IoT application scenarios
Speaker: Francesco Doddo, STMicroelectronics

The availability of the Internet Protocol (IP) suite on constrained devices, including IPv6 and 6LoWPAN, makes a new kind of interoperability for connected devices and Smart Objects possible. IPSO Alliance's Smart Object Guidelines provide a common design pattern, an object model, that can effectively use the OMA Lightweight M2M (LWM2M) and the IETF Constrained Application Protocol (CoAP) to provide high-level interoperability between devices such as wireless sensors/actuators and connected applications on other devices and services. The presentation will introduce these recently published open standards and outline how they can benefit IoT application domains such as smart home and smart city.

Session 1 Abstracts

MEMS Micro-actuators enabling new and unforeseen applications
Speaker: Matteo Fusi, STMicroelectronics

MEMS-based Micro-actuators have evolved over the past few years enabling a wide range of new applications. Laser Beam Scanning (LBS) has become an attractive way to create innovative solutions, including, pico-projector, heads-up display (HUD), Head Mounted Display (HMD) and Virtual/Augmented Reality (VR/AR). The miniaturized form factor and very low power consumption of micro-actuator based components can fit into new types of wearable and portable devices, which didn't exist until recently. This presentation will discuss the above mentioned solutions and automotive 3D Sensing as well as Advanced Driver Assistance Systems (ADAS).

Pressure sensor technology enabling consumer, industrial and medical applications
Speaker: Jay Esfandyari, STMicroelectronics

Since MEMS-based pressure sensors were introduced in the 1970s, there have been achievements in performance, functionality, integration, size, and cost. Today, the same pressure sensor can be used as a barometer in a weather station, an altimeter in drones, for the enhancement of GPS and indoor navigation, for air pressure control in a chamber, and in sport watches to name a few applications.

MEMS processes used to develop the mechanical sensing element of ST pressure sensors offer an ultra-compact piezo-resistive monolithic sensor that can stand high burst pressure because of the intrinsic mechanical stopper, and it has good temperature behavior because of only one temperature expansion coefficient (only silicon). This presentation will discuss in detail the two processes - VENSEN and BASTILLE- developed by ST to manufacture highly integrated and fully calibrated pressure sensors.

THELMA technology platforms at the heart of MEMS sensing technology
Speaker: Jay Esfandyari, STMicroelectronics

MEMS technology offers a wide range of advantages including high functionality, high precision and accuracy, low cost, small size, low latency, high level of integration, and low power consumption. The key elements in a MEMS device are a micron-sized transducer realized through a specific MEMS process, an advanced chip with embedded smart functionalities, a dedicated package, and tailored calibration features.

The MEMS process developed by ST is called THELMA (THin Epitaxial Layers for Microgyroscopes and Accelerometers). Over the past decade, THELMA has been used to develop and manufacture more than 11 billion sensors that have been deployed in consumer, automotive, medical, and industrial applications. This presentation will dive deep into the THELMA process and discuss in technical details some of the latest devices based on that process.

Session 2 Abstracts

IoT Security by Design
Speaker: Hugo Fiennes, CEO of Electric Imp

IoT security encompasses requirements that are new for many product designers – such as provisioning, authentication, OTA upgrades and link encryption – and weaknesses in any one could potentially be used to compromise the security of the end product.

This session takes a multi-dimensional view on Defense-in-Depth, delivered by one of the world's premier experts in connected-device operations. We will explore the many possible attack vectors that product designers need to consider when designing successful IoT devices and nuances of security at all layers. From device, OS, network, and data, to cloud and applications. You'll leave knowing why security certification is crucial for success and why being the world's first IoT platform to earn UL cybersecurity certification is important and benefits virtually any IoT implementation.

Platform level security for IoT devices
Speaker: Bob Waskiewicz, STMicroelectronics

An essential requirement for any IoT device is its trustworthiness. In this session, using an example of a secure IoT platform, we'll explore implementation-techniques for protecting code, over-the-air updates, provisioning and tamper detection, being used in concert to establish a well-fortified platform.

Integrating Strong Security Elements into your IoT Device Design
Speaker: Nisarg Desai, Product Manager for IoT Solutions, Global Sign

Connecting technologies and deploying them in new cyber-physical environments extends the attack area in an ecosystem. Increasingly, providers are leveraging software-based mechanisms to control feature-enablement of their devices, leading to the question: How do you ensure the security and integrity of the IoT device?

A unique, immutable and unclonable identity is the essential first step to securely verifying the authenticity of your devices. A strong hardware based root-of-trust is needed. Provisioning these strong identities at the hardware level allows for protection against identity spoofing and key compromise.

This talk will showcase how time-proven PKI technologies along with key protection solutions like TPMs and PUFs can imprint a unique thumbprint, a Strong Device Identity to your IoT device and establish the needed trust within your IoT ecosystem.

Introduction to ST's Time of Flight Technology: FlightSense
Speaker: John Kvam, STMicroelectronics

ST has developed and patented its own technology, called FlightSense™, using Time-of-Flight (ToF) principle in order to propose a new generation of high-accuracy proximity sensors. In this session you will learn how ST's Time-of-Flight sensor works, how to integrate it into your industrial design and understand key performance indicators. You will also go through an overview of the Evaluation Kit and supporting GUI.

Session 2 Abstracts

NFC Readers: Easy Implementation in Challenging Environments
Speaker: Daniel Merino, STMicroelectronics

This session will cover the ST NFC/RFID High performance readers distinguishing features to easing design process and ensure robust operation in challenging environments. Features such as Automatic Antenna Tuning, Multi Antenna support, High output power (1.4W), Dynamic Power, Gain & Squelch, Capacitive / Inductive wake up will be discussed.

NFC of Things
Speaker: John Tran, STMicroelectronics

Secure, ease of set up and use are key to enabling a rapid proliferation of successful IoT devices. This session will describe various ways NFC (readers and tags) can be used to secure & manage IoT devices (Cloud provisioning, Wi-Fi setup, BT pairing, lifecycle management, brand protection, payment, etc.).

Baluns & Protection
Speaker: Alfredo Arno, STMicroelectronics

In this session, we will present ST's ESD protection and common mode filter product portfolio for High Speed applications like USB Type C. We will also present our protection solution against transients on USB charging applications. We will then provide an overview of ST's RF Integrated passives, a unique product family which helps integrate multiple RF discrete components using a thin film process and which has wide ranging applications like WiFi, Bluetooth and cellular.

ThingSpace by Verizon: Delivering on the promise of IoT
Speaker: Verizon

Simplifying the design, development and deployment of Internet of Things (IoT) solutions with ThingSpace, a platform designed to give developers the ability to create applications, customers the ability to manage devices and partners the ability to market their services in an open environment as well as a new, dedicated network core with new LTE connectively options for the next-generation of IoT use cases.

Session 3 Abstracts

Advanced BLDC motor controller
Speaker: Giovanni Tomasello, STMicroelectronics

The STSPIN32 provides a unique opportunity to design a high performance and sophisticated three-phase motor drive in a very compact and economical package. The combination of a 32 bit arm core processor with advanced peripherals (such as an advanced 16 bit motor control timer) with a high current, 6 channel MOSFET gate driver and two onboard regulated power supplies provides the designer with an essentially turn-key system. Just add MOSFETs to match the application requirements and the application software for the embedded STM32F0, and the design is done. In this presentation, we will cover the available evaluation hardware and ST provided motor control software library which is available to give the designed a quick start. Development tools and techniques will be presented with the objective to present a detailed overview of the suggested design and development process, using the STSPIN32 and the motor control library.

Motor driver solutions for ultra-low voltage applications
Speaker: Giovanni Tomasello, STMicroelectronics

Integrated motor drivers for driving solenoid, relay or motors (both 3-phase BLDC and Brush DC) with up to 1 Amp current and 10V of drive voltage will be the main topic of discussion in this session. This presentation will include in-depth discussion on ST's new motor driver series of STSPIN230, STSPIN240 & STSPIN250 ICs. Tools and development environment available for these products will be discussed.

Robust design with major power discrete technologies
Speaker: Giovanni Tomasello, STMicroelectronics

This presentation will treat the major failures modes for power discrete technologies based on Si or SiC (MOSFETs, IGBTs, SCR's, Diodes) with the target of providing design guidelines for a robust application design.

AC-DC SMPS: up to 15W application solutions
Speaker: Ivan Ivanov, STMicroelectronics

This presentation will cover applications of offline power supply, running from American or European main voltage for a power level of up to 15 watts. Discussion will include application tricks to optimize EMI, efficiency, layout, standby power consumption and external component counts. ST's online design tool, the eDesign suite will be used to show various design iterations for 0-15 watts of AC-DC switch mode power supply.

Session 3 Abstracts

USB Type-C & PD
Speaker: Greg Gosciniak, STMicroelectronics

USB standard has evolved from a data interface capable of supplying limited power to a primary provider of power with a data interface. The new USB PD is now enabling a new ecosystem. Different use cases will be explained, showing implementations and major products involved.

SiC MOSFET benefits
Speaker: Jeff Fedison, STMicroelectronics

Large advantages are offered by SiC solution in terms of power losses, efficiency and thermal performances. The combination of the all advantages despite the extra cost of SiC MOSFET, is not leading to solution cost competitiveness vs standard technology. Performances figures for SiC MOSFETs will be treated and detailed in this presentation.

Wireless Battery Charging
Speaker: Paolo Battezzato, STMicroelectronics

Wireless Battery Charging transmitters are expected to become ubiquitous, allowing consumers to leave their cables at home and charge their portable/ wearable devices anywhere by means of electromagnetic induction used to transfer power from a WBC transmitter (TX) to a receiver (RX) in the device. This presentation will cover both the transmitter (STWBC family) and the receiver (STWLCxx family of Dual-Mode receivers) solutions.

Hands-on Training

ST SensorTile and IBM Watson Hands-On Workshop
Learn how to jump-start your next IoT design with IBM Watson and the SensorTile: a development platform with Bluetooth® Smart and 10 degrees of freedom
Presenter: STMicroelectronics team with John Walicki from IBM

This hands-on workshop will show you how to simplify the integration of sensors, low energy Bluetooth®-smart connectivity, a low-power microcontroller and sensor fusion libraries into your next IoT design using the SensorTile development kit. You'll then learn to connect the SensorTile to IBM Bluemix and Watson IoT Platform to create a new application in minutes using Node-RED.

The hands-on training is a working session – please bring your laptop either a Windows® Laptop (Windows 7, Windows 8, or Windows 10) or MacBook running Windows (Parallels, VM Fusion, etc). Note: Administrator rights is needed for software and driver installation. ST will provide the required STM32 development boards and software. SPACE IS LIMITED FOR THIS SESSION – FIRST COME, FIRST SEATED. Must be present and stay for training to receive free kit.

STM32 Nucleo Pack for IoT Hands-On Training: Simplifying Microsoft Azure IoT Suite Connectivity for Embedded Devices
Speaker: STMicroelectronics team

The hands-on workshop will use a [STM32 Nucleo pack for IoT](#) node to demonstrate how simple it is to connect to Microsoft Azure IoT Suite and enable you to start exploring your own innovative ideas! The STM32 Nucleo pack features an array of sensors, NFC and Wi-Fi to showcase our cloud connectivity features.

The hands-on training is a working session – please bring your laptop either a Windows® Laptop (Windows 7, Windows 8, or Windows 10) or MacBook running Windows (Parallels, VM Fusion, etc). Note: Administrator rights is needed for software and driver installation. ST will provide the required STM32L4 Nucleo pack and software. SPACE IS LIMITED FOR THIS SESSION – FIRST COME, FIRST SEATED. Must be present and stay for training to receive free kit. Please include the hyperlink

Solve connectivity challenges with Sigfox
Presenter: STMicroelectronics team

This hands-on session will share unique ways industries from agriculture to smart cities are tapping into the power of the IoT, and how the low cost, low energy, complementary technology of the Sigfox global IoT network enables the masses to become connected. Participants will then get a chance to use the Sigfox network with an ST Development Kit.

The hands-on training is a working session – please bring your laptop either a Windows® Laptop (Windows 7, Windows 8, or Windows 10) or MacBook running Windows (Parallels, VM Fusion, etc). Note: Administrator rights is needed for software and driver installation. ST will provide the required STM32 development boards and software. SPACE IS LIMITED FOR THIS SESSION – FIRST COME, FIRST SEATED. Must be present and stay for training to receive free kit.