# Session 1 Abstracts

**Cloud Connected IoT Sensor Nodes with STM32**
9:30 – 10:10
Presenter: Manuel Cantone, STMicroelectronics

In this session, we will present the various solutions from ST to connect your IoT node to AWS IoT Core, Microsoft Azure IoT Hub and IBM Watson IoT. The IoT node will transmit sensor data and receive commands to and from Cloud services. These SW packages can jump-start any end-to-end IoT development, saving time in the integration of the different basic functions needed for a sensor-to-cloud development environment.

**ST SmartTag: NFC Enabled Sensor Node**
10:20 – 11:00
Presenter: Gianmarco Ferrari, STMicroelectronics

ST SmartTag is a sensor node that can sense temperature, humidity, pressure, motion and transmit the data when triggered by an NFC reader. It can be scaled down based on requirement of several applications, ranging from supply chain, asset tracking to medical, smart apparel, packaging and agriculture. Participants will learn about the ST SmartTag reference platform and its deliverables to accelerate their own design.

**How to design a NFC Reader application: a Step-by-Step approach**
11:10 – 12:00
Presenter: Gianmarco Ferrari, STMicroelectronics

This presentation will focus on the key challenges of designing a NFC reader application. Product selection, Antenna tuning, Layout optimization, Read Range, Noise reduction, Power Consumption optimization, Testing and Certification are among the most important aspects in this application design space. Participants will learn how to develop a NFC Reader application leveraging ST High Performance Reader ICs and evaluation tools.

**Unicleo GUI to Evaluate and Configure SensorTile**
1:00 – 1:40
Presenter: Mauro Scandiuzzo, STMicroelectronics

The ST SensorTile is a tiny, square-shaped IoT module that packs powerful processing capabilities leveraging an 80 MHz STM32L476JGY microcontroller and Bluetooth low energy connectivity based on BlueNRG-MS network processor as well as a wide spectrum of motion and environmental MEMS sensors, including a digital microphone.

During this session, you will learn how to do fast evaluation and development based on SensorTile and UNICLEO GUI. Using UNICLEO GUI you can configure run time the sensors without debugger, without writing code in order to achieve a Fast Prototyping, reduce time to market in a plug a play small system solution. We will also give examples of how you can use the SensorTile platform to reduce the time to market using available HW, SW, GUI and algorithms.

**ST IPAD™ technology: A key enabler for IoT miniaturization**
1:50 – 2:30
Presenter: Rahul Peravali, STMicroelectronics

STMicroelectronics proprietary IPAD™ (Integrated Passive and Active Devices) technology is leading the way in reducing the footprint of peripheral electronics surrounding intelligent ICs. In addition to resistors, capacitors, and inductors, IPAD can also incorporate ESD diodes and TVS functions for high density protections, filters, and impedance matching circuits. In this discussion, attendees will learn how the broad ST portfolio can help reduce size and cost of their IoT devices.

**Low Power Microphone Acquisition and Processing for Always-on Applications**
2:40 – 3:20
Presenter: Sean Newton, 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.

**Introduction to ST's Time of Flight Technology: FlightSense**
3:30 – 4:10
Presenter: John Kvam, STMicroelectronics

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

**Getting the Most Out of ST's Time of Flight products**
4:20 – 5:00
Presenter: John Kvam, STMicroelectronics

This session will go deeper in to ST's FlightSense technology.

# Session 2 Abstracts

**Trusted, Safe and Secure: Securely Connecting the Internet of Things**
9:30 – 10:10
Presenter: Steve DeLaney, President of Cypherbrige Systems LLC

The presentation highlights SDKPac for STM32, a go-to project solution for connected device security supported on the ST STM32 F, H and L families of MCUs.

**Platform Level Security for IoT Devices**
10:20 – 11:00
Presenter: 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

**Embedded Graphics Possibilities Using the STM32**
11:10 – 12:00
Presenter: Steve Miller, STMicroelectronics

Looking to add an intuitive graphical user interface to your next embedded design? Need to understand which displays can be used with a microcontroller: LED, LCD, Color TFT, or MIPI-DSI? Are you aware of the graphic tool kits available to quickly create graphical images and display them with your MCU?

In this session you will learn what options are available for displaying graphics using the STM32 family of microcontrollers. The presentation will cover:
- Graphic peripherals available within the STM32 Family
- Common display types and resolutions supported
- Graphical tool kits and libraries available to assist in your next graphical user interface design
- Performance features available to fully optimize and improve STM32 CPU performance enhancing your next embedded design

An overview of the STM32 ecosystem showing available hardware, software and documentation necessary to realize your next graphics based embedded design will also be included.

**Understanding Bluetooth low energy (BLE) for Industrial applications**
1:00 – 1:40
Presenters: Hary Radakichenane and Raffaele Riva, STMicroelectronics

This class will focus on the key challenges of designing Bluetooth® low energy (BLE) IoT nodes for Industrial applications. Range, reliability, security, and proximity detection are among the most important aspects in this application space. To effectively address them, three key technologies will be discussed in details: Bluetooth Mesh, BLE Beacons, and simultaneous BLE and Sub-GHz communication. Participants will learn how to understand their key performance indicators and how to leverage on ST solutions for developing their Industrial applications.

**Wireless Charging in Consumer Applications**
1:50 – 2:30
Presenter: 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 for applicatinos from 1W up to 15W.

**Qi-ready Solutions from Würth Electronik**
2:40 – 3:20
Presenter: Hebberly Ahatlan, Field Applications Engineer, Würth Electronik

Introduction to wireless charging coil technologies and application challenges with a brief product overview of Wurth Qi inductors and coil selection tools.

**USB Type-C PD**
3:30 – 4:10
Presenter: 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 Type-C PD is now enabling a new ecosystem. Different use cases will be explained, showing implementations and major products involved.

**Power Over Ethernet**
4:20 – 5:00
Presenter: Paolo Battezzato, STMicroelectronics

Power over Ethernet (PoE) is a widely adopted technology used to transfer both data and electrical power over an RJ-45 cable. ST offers solutions for PoE applications, on the powered devices (PD) side, compliant with both the more recent IEEE 802.3at specification, commonly known as PoE+, and  the former IEEE 802.3af (PoE). ST offers now solutions also for the most recent IEEE 802.3bt with power up to 99.9W with the PM8805 which is a system in package for powered devices (PD) applications within the PoE world. It embeds: two active bridges and their driving circuitry, a charge pump to drive high-side MOSFETs, the hot-swap MOSFET and the standard single-signature interface IEEE 802.3bt-compliant, including detection, classification, UVLO and inrush current limitation. The device targets the highest possible efficiencies with the smallest footprint providing the interface section of PoE switch mode power supplies and a PGD signal that can be used to enable a PWM controller, a DC-DC converter or a LED driver.

# Hands-on Training Room

**BlueNRG-2 based IoT node Hands-On Workshop: Learn how to jump start your next IoT design with the BlueNRG-2 low power Bluetooth low energy (BLE) System-on-Chip and ST sensors**
9:30 – 12:00
Presenters: Raffaele RIVA + Francesco Doddo; STMicroelectronics

This hands-on workshop will show how to simplify the integration of sensors and Bluetooth low energy (BLE) connectivity into your next IoT design using the BlueNRG-2 low power Bluetooth low energy (BLE) System-on-Chip from ST.

The workshop will focus will focus on the BLE protocol and how to develop an embedded application running on BlueNRG-2 System-on-Chip. Participants will learn how to develop a Sensor to Cloud IoT application: acquire sensor data on the BlueNRG-2 evaluation board, transmit them over the BLE link to the ST "BlueMS" mobile application for iOS and Android, and finally post them on the IBM Watson could platform.

SPACE IS LIMITED FOR THIS SESSION – FIRST COME, FIRST SEATED.


**STM32 & Motor Control Hands-on training session**
1:00 – 4:00
Presenters: STMicroelectronics Team

This session will present the STM32 ecosystem for advanced field oriented control (FOC) development of motor control applications with a hands on approach. Using the motor control Nucleo pack for the hardware and the new SDK v5.0 we'll first explore how to characterize a motor with the Motor Profiler and then walk through an improved development approach using the motor control workbench GUI with a workflow supporting the STM32CubeMX GUI configurator while using a motor control firmware library now based on the STM32Cube HAL/LL libraries. This will provide developers with an introduction to a full motor control ecosystem to implement the high performance and high efficiency solutions required for standalone and IoT applications of the future.

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 are needed for software and driver installation.

ST will provide the required Motor Control Nucleo Pack (P-NUCLEO-IHM002) and software.

SPACE IS LIMITED FOR THIS SESSION – FIRST COME, FIRST SEATED. Must be present, have a PC with administrator rights and stay for training to receive free kit.


**Motor Driver solutions for ultra-low voltage applications**
4:20 – 5:00
Presenter: 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.