



**IEEE IoT Vertical and Topical Summit - Anchorage  
September 18th-20th, 2017  
Hilton Hotel  
Anchorage, Alaska**

**Call for Participation and Proposals**

With its dispersed population, cultural diversity, vast area, varied geography, climate extremes, importance to world ecosystems, and a richness of natural resources, Alaska is uniquely positioned to explore the potential and challenges facing the Internet of Things (IoT) in its quest to create sustainable value. To facilitate this exploration in a global context, the IEEE IoT Multi-Society Technical Group is bringing together experts and stakeholders from industry, the public sector, and the research and academic communities to Anchorage for a Summit from 18-20 September 2017.

We have selected five vertical and five topical themes that are important to IoT, and especially to Alaska, as a focus for the Summit, and are requesting proposals for speakers, panels, workshops, and tutorials prior to 15 July, 2017. Below you will find descriptions of each theme along with instructions for submitting proposals, a list of invited speakers, and information about the Summit's Organizing Committee

We look forward to incorporating your proposals into a stimulating program and anticipate your participation in this important dialog. At the same time, we hope that you can take this opportunity to explore some of the wonders of Alaska near Anchorage or further afield.

As part of the conference there will be a banquet for attendees and participants on Tuesday September 19th. For those who would like to take advantage of opportunities once in Alaska there will optional events before and after the Summit.

You should plan to attend this conference if you are interested in the Internet of Things, if you would like to understand how IoT would revolutionize the government, industry, and individual lives. The Summit will focus on five Vertical Themes in the area of IoT:

## **Vertical Themes:**

### **1. Education:**

This summit will address technologies, frameworks and approaches aimed at: increasing and enhancing student and educator engagement; creating transformative learning environments, communities, and experiences that can provide a hands on instructions online, equivalent to or better than in a typical classroom or lab; broadening participation by virtually shortening distances and maintaining education quality; providing security and privacy; meeting implementation cost, teacher training, and new ethics challenges. The track on Education will also highlight successful examples of distance learning implementations, deployments, and experiences, as well as new and novel approaches for improving the quality and nature of education through deployment of IoT infrastructure.

### **2. Healthcare:**

IoT technologies, platforms, and approaches that transform monitoring, diagnosis, care, and treatment; health - care specific cyber-security; and data analysis and predictive analytics using big and small data. Mixed reality systems that provides hands on experience online that is equivalent to a clinic or doctor's office experience. This can be beneficial for training and telemedicine application in remote Arctic areas. The challenge is to bring high quality Healthcare to a widely dispersed and population and do so in a culturally acceptable way and cost effectively. The Healthcare track is also expected to address experiences from "connected health", "telemedicine", and "e-health" and to explore key factors for success and challenges in practice.

### **3. Arctic Region and Alaska Challenges:**

The Internet of Things promises to transform the quality of human life, economic development, education, and healthcare, as well as situational awareness, and crisis response in Alaska and the Arctic. However, geography, the dynamically changing Arctic environment, lack of connectivity, and socio-economic and cultural factors pose unique set of challenges for the development and penetration of IoT in the Arctic. This track of the IEEE IoT Summit - Anchorage will focus on the potential applications and opportunities for IoT in the Arctic and on the effects and possible approaches to overcome specific key challenges including: limited broadband access, variable connectivity over immense distances, multiple cultural and regulatory regimes, sparse data sets, the need to develop Arctic-capable hardware, and resilient edge computing frameworks and infrastructure. Also maritime challenges including search and rescue missions, and the monitoring of vessel activity pose additional challenges that the IoT can help resolve. Alaska and the Arctic include many unique natural phenomena that affect our planet. The IoT is also an indispensable tool for improving our understanding of these phenomena, examples of which are: active volcanic zones; seismic activity from movement of tectonic plates; a complex maritime ecology; glaciers and ice caps; and the high latitude ionosphere and magnetosphere.

#### **4. Aviation and Unmanned Aerial Systems:**

Alaska has one of the highest ownership rates for private aviation, which forms the backbone for movement of goods and services across the State. Alaska has strong tradition in Aviation and UAS research and innovation. UAA has received the Robert J. Collier Award "for the greatest achievement in aeronautics or astronautics in America, with respect to improving the performance, efficiency, and safety of air or space vehicles, the value of which has been thoroughly demonstrated by actual use during the preceding year." Alaska is also one of the six FAA-designated test ranges and a partner in the FAA's Center of Excellence for Unmanned Aircraft Systems (COE UAS). The Summit will address how IoT can contribute to improved safety, situational awareness, maintenance, and operations of Aviation in the wide range of conditions encountered across the State. This includes the role of Aviation in search and rescue, and other emergency response situations. The rapid growth in the adoption of Unmanned Aerial Vehicles promises myriads of uses, and for Alaska it may have extraordinary impact. The track will address potential use cases for UAV operations and how UAV's can contribute to the improvement of life in the Arctic, the Charting of the State, gathering of Scientific Information, support for industry, and improved stewardship of natural resources. At the same time the track will address the infrastructure and ancillary systems that will be needed to support increased uses of UAV's and the design and implementation of UAV and supporting Systems that can fit the requirements of the most promising use cases.

#### **5. Oil, Gas, and Natural Resources:**

Alaska is a significant producer of products from Oil and Gas reserves and from Mining and other Natural Resource sources. It is an important part of the State's economy. For the Industries in this sector there is an accelerating trend towards digitization of processes and facilities and IoT plays an important part of that future. The impact can be seen in the life cycle of projects in the industry from design, to implementation, to operation, maintenance and upgrades, and eventual retirement. One aspect of IoT is that it depends on common infrastructure for scale, for affordability, and for efficiency. Alaska and other Arctic regions pose unique requirements on IoT deployment and implementation and the track will seek to identify what those requirements are and approaches for potential solutions. This topic specifically includes potential Architectures for IoT, movement of data, extended use of prognostics and diagnostics, common services, and how to deal with climatic conditions, and remote operations. As with the other tracks the Summit also seeks examples of actual and planned IoT implementations.

## **Topical Themes<sup>1</sup>:**

### **1. Connectivity and Communications:**

The Internet of Things puts a premium on the ability of product designers and service providers to incorporate easy to use, cost effective, systems that can provide communications for many different applications. This includes connectivity between objects, between objects and people, access to remote sources of information, and shared computing and storage facilities. At the same time a commonly held vision of IoT is that the connectivity utilizes a shared infrastructure. The sessions on this Topical Area will explore the requirements, challenges, and solutions posed for various approaches and how those challenges can be addressed through choices of architecture and technology. The great challenge for Alaska is the sheer size and the geography of the State.

### **2. Big Data, Analytics and Artificial Intelligence:**

The heart of what drives IoT is the digitization of products, services, and processes, improving how we manage individual lives, corporate enterprises, and public institutions. IoT brings new complex problems where the data comes from many sources, in many forms, can be real time, or historic, and massive in scale. In applications that data is used through analytics to make decisions and take courses of action. In the past it was possible to do that only for problems of national importance or very high value applications - to afford the expense of infrastructure dedicated to a single purpose. The evolution of computing, storage, and communications technology now makes it routine for a much broader set of use cases. The step beyond that is to build the "decision loop" into autonomous systems using various forms of Artificial Intelligence. The Sessions on this topic will cover the advances in Big Data, Analytics, and AI and concentrate on examples of successful deployments and plans for future products and services relevant to the Vertical focus of the Summit.

### **3. Security and Privacy:**

The IoT poses a new challenge for security and privacy. The estimate is that the IoT world will cross 50 Billion devices sometime in the early 2020's. Many of those will be critical to safety, individual well being, large-scale operations, and represent loss of significant value if disrupted. An important aspect of IoT is that solutions and applications are part of a complex eco-system and that end-end security and reliability depends on many parties. The Sessions will address the new threats that IoT enables, the approaches to dealing with them, and the emergence of basic principles for effectively dealing with security and privacy, as well as the education needed to create awareness and improve the public intuition about cyber-security.

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<sup>1</sup> These apply to all Vertical Themes.

#### **4. Economics of IoT and Sustainability:**

Two dimensions of the allure of IoT are the fundamental impact on economics and the unleashing of innovation. The economics are impacted by several factors that include the exploitation of common infrastructure (for power, communications, computing, and data storage), and deep digitization of products, services, and processes. These in turn make it practical to use data and analytics to achieve high levels of optimization in operating complex systems efficiently. That does not come without a cost and poses a basic question of how can the infrastructure be afforded in sparsely populated areas without causing or creating a new digital divide? On the innovation front new business models have sprung up around IoT that change the way services are delivered and paid for. An example is the use incentives and assignment algorithms in Uber for personal transportation. A somewhat different case is electrical smart-grid control for reducing the peak load factors, and hence generating capacity needs, by regulating in home appliances loads to off-peak times. The Sessions will include presentations on economic models for IoT and discuss the implications they have for IoT deployment and sustainability.

#### **5. Public Policy and Regulations:**

The deployment of IoT holds great promise for every Vertical. Much of the value comes from changing the way business is done and in changing the traditional responsibilities of the organizations in both the public and commercial sector. A natural first question is what policies and regulations no longer make sense and should be set aside to garner the benefits from IoT. The second thought is how to prepare for the transition and minimize the effect of dislocation. Two examples come to mind: the transition of TV stations from analog to digital where a considerable population of customers were left with TVs that no longer worked; and the abandonment of automotive customers with analog cellular services for early "connected cars" when service providers introduced 3G services and phased out earlier systems. The disruption of traditional wireline services - cord cutting - is creating a similar wave of impacts as communications transition to all IP Networks. A specific issue for IoT is the roles, responsibilities, and obligations of organizations in IoT ecosystems when providing end-end services - the issues range from whom do you call when the service is not working, who fixes it, and who bears the cost? The Session will provide overview talks on broad issues of Policy and Regulations and how they are being approached in different parts of the world and in different industries. The session will also discuss how deployment of IoT can be accelerated responsibly and what steps are needed in policies and regulations to keep up with the rapid evolution of IoT.

## **Submitting a Proposal**

Submission deadline: 15 July, 2017

Notifications of acceptance will be returned by 1 August, 2017

### **IoT Summit Focus Verticals**

- **Education**
- **Healthcare**
- **Arctic Region and Alaska Challenges**
- **Aviation and Unmanned Aerial Systems**
- **Oil, Gas, and Natural Resources**

Conference proposals must be marked and submitted electronically: <https://edas.info/newPaper.php?c=23721&track=85850>

### **IoT Summit Topical Areas**

- **Connectivity and Communications**
- **Big Data, Analytics and Artificial Intelligence**
- **Security and Privacy**
- **Economics of IoT and Sustainability**
- **Public Policy and Regulations**

Conference proposals must be marked and submitted electronically: <https://edas.info/newPaper.php?c=23721&track=85850>

### **Important dates for IoT Summit Focus Verticals & Topical Areas**

IoT Track proposal submissions Due Date: July 15, 2017

Proposal Acceptance notification: August 1, 2017