IEEE GLOBECOM™ 2019

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Revolutionizing Communications

CALL FOR PAPERS AND PROPOSALS

SAC Tactile Internet Track

SYMPOSIUM CO-CHAIRS:

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SCOPE AND MOTIVATION:

In future wireless communications, requirements beyond content distribution, more and more applications, where the system capacity may not be the critical point, but rather stringent latency and/or reliability requirements, will emerge. Some of the new applications will demand an end-to-end latency of a few milliseconds, while fields such as wireless automation and control may in addition require reliabilities in terms of block error rates on the order of 10^{-9}. Ultra-high reliability and ultra-responsive network connectivity, hereby, will be the key technological advancements to enable various applications like for example the Tactile Internet for remotely real-time control and tactile experience delivery.

Within this context, human beings' interaction with their environment is crucial. We experience interaction with a technical system as intuitive and natural only if the feedback of the system is adapted to our human reaction time. Consequently, the requirements for technical systems enabling real-time interactions depend on the participating human senses. For technical applications to match humans' interaction with their environment, our natural reaction times set the targets that technical specifications must meet. The most challenging latency requirement for technical systems arises in tactile or haptic interaction. Solutions for this kind of requirements are addressed within the framework of the Tactile Internet, which has been defined by IEEE P1918.1. as "*A network or network of networks for remotely accessing, perceiving, manipulating or controlling real or virtual objects or processes in perceived real time by humans or machines.*"

Given its requirements' space and target applications, 5G is an important enabler of such an internet as it will need to deliver the required edge-connectivity. Because the Tactile Internet will be servicing really critical aspects of society, it will need to be ultra-reliable at a second of outage per year; support very low latency and short end-to-end delays in the order of milliseconds; and have sufficient capacity to allow large numbers of devices to communicate with each other simultaneously and autonomously. It will need to be able to interconnect with the traditional wired internet, the mobile internet and the internet of things – thereby forming an internet of entirely new dimensions and capabilities.

Optimizing wireless communications for latency and reliability requires a complete paradigm change in wireless systems design, and has to be reflected in various technology fields, such as air interface design, signal processing on both the device and infrastructure side, network infrastructure and architecture considerations, control / user plane design, session management and protocol stack design. The track provides a platform for technical experts from the radio, core network and application side to elaborate on latency and reliability requirements of future applications or provide solutions to significantly reduce end-to-end latency and/or increase reliability in wireless communications systems.

MAIN TOPICS OF INTEREST:

The Selected Areas of Communications Symposium Tactile Internet track seeks original contributions in, but not limited to, the following topical areas:

- Solutions to reduce end-to-end latency and/or introduce higher reliability in Tactile Internet applications, including

- Air interface and signal processing concepts,
- Advanced radio resource management techniques,
- Redundant or multi-point transmission, multi-point connectivity,
- Novel approaches towards session management and protocol stack,
- Network infrastructure and core network concepts,
- Cloud-RAN and mobile edge-cloud concepts in the context of latency- or reliability-critical applications,
- Architectural enablers for distributed or edge computing,
- Technical solutions to allow for a co-existence of traffic with stringent latency/reliability requirements and other traffic (e.g. with ultra-high throughput requirements).
- Haptic codecs
- New waveform design
- Ad-hoc networking, routing, handover, and meshing
- Novel deployment concepts and system architectures

- Network & Cloud solutions
  - Context-aware computing
  - Cloud-based mobile architectures
  - Communication architectures and protocols for Tactile Internet applications
  - Multi-service architectures and interworking
  - (Secure) network coding
  - Mobile edge cloud computing, personal clouds & cloudlets
  - Network edge intelligence

- Revolutions in Hardware
  - Low latency and low power circuits
  - Reconfigurable multi-standard systems
  - Design of new 3D chips and haptic devices
  - Results from prototypes, test-beds and demonstrations

Paper Submission: 15 April 2019,
Acceptance Notification: 15 July 2019,
Camera-Ready: 16 Aug 2019,

together with the submission link: https://edas.info/N25074