



# Agenda

- ▶ Welcome & Introduction
- ▶ Highlights of the Sub-Committee Meeting Minutes (ICC 2017)
- ▶ Updates on the Tactile Internet Activities
- ▶ Teaser Talk by Toktam Mahmoodi
- ▶ Updates on the Tactile Internet IEEE standardization activities
- ▶ Any other Business

# Meeting Highlights of the ICC 2017 Meeting

- ▶ It has been requested to inform the TI chair about activities, workshops, tutorials, etc. to add this information to the website
- ▶ More publicity is requested
- ▶ Discussion and decision on the TI logo
- ▶ Talk by Zaher Dawy

# Meeting Highlights of the ICC 2017 Meeting



## Tactile Internet Emerging Technical Subcommittee

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## Welcome to Tactile Internet Emerging Technologies Subcommittee



Recently, the Tactile Internet has been defined by the IEEE P1918.1 Tactile Internet ad-hoc definition group 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."

The Tactile Internet (TI) Technical Sub-committee will focus on exploring and elucidating all facets of the next generation of "Tactile Internet" technology, business and societal gaps and challenges.

Extremely low latency in combination with high availability, reliability and security will define the character of TI. It will have a marked impact on business and society, introducing numerous new opportunities for emerging technology markets and the delivery of essential public services.

Prof. Dr.-Ing. Dr. h.c Gerhard Fettweis (Technical University Dresden, Germany) describes the tactile internet as "It is nothing less than a new level of the digital revolution". He presented the tactile internet in various organizations, e.g., in Steinbeis-Europa-Zentrum, which is a center for research and industrial collaboration in Europe: [http://download.steinbeis-europa.de/2013-10-29-30\\_CPS/29102013-cps-fettweis-vodafone.pdf](http://download.steinbeis-europa.de/2013-10-29-30_CPS/29102013-cps-fettweis-vodafone.pdf) or in the wireless world research forum: [http://www.wwf30.ch/tl\\_files/Themes/wwf30/wwf30\\_documents/Gerhard%20Fettweis%20WWRF%202013%2004%2024.pdf](http://www.wwf30.ch/tl_files/Themes/wwf30/wwf30_documents/Gerhard%20Fettweis%20WWRF%202013%2004%2024.pdf)

The objectives of the TI Sub-committee are to facilitate the worldwide harmonization of research, pre-standardisation and best practices for deployment user scenarios of the global TI ecosystem, to design the built-in security and privacy and to explore ways the tactile technology can be realized in different segments such as in engineering, automobile, transport and logistics, health service, and public. The TI Sub-committee will target the understanding of the tactile

# Report of the Chair

## ▶ Multiple workshops at flagship conferences

- IEEE ICC 2015: Workshop on "[5G & Beyond – Enabling Technologies and Applications](#)"
- IEEE Globecom 2015: Workshop on "[Ultra-Low Latency and Ultra-High Reliability in Wireless Communications](#)"
- IEEE WCNC 2016: Workshop on "[IEEE International Workshop on 5G & Beyond – Enabling Technologies and Application with focus on the Tactile Internet & Vertical Industry](#)" (workshop program)
- IEEE Globecom 2016: Workshop on "[Ultra-Reliable and Low-Latency Communications in Wireless Networks \(URLLC\)](#)"
- IEEE Globecom 2016: Workshop on "[Wireless Networking, Control and Positioning for Unmanned Autonomous Vehicles](#)"
- IEEE WCNC 2017: Workshop on "[5G & Beyond – Enabling Technologies and Applications with focus on the 5G Tactile Internet \(5G TACNET\)](#)"
- IEEE Globecom 2017: Workshop on "[Ultra-Reliable and Low-Latency Communications in Wireless Networks \(URLLC\)](#)"
- IEEE ICC 2018: Workshop on "[5G & Beyond – Enabling Technologies and Applications with focus on the 5G Tactile Internet \(5G TACNET\)](#)"

# Report of the Chair

## ► Multiple other activities

- IEEE Globecom 2015: Tutorial on [“5G Tactile Internet: Application, Challenges and First Solutions”](#).
- Globecom 2016: Tutorial on [Leveraging Big Sensed Data in the IoT: Challenges and Future Outlook](#)
- VDE ITG Fachtagung 2016 [“5G Mobile Networks – Towards the Tactile Internet”](#)
- IEEE ComSoc Technology News 2017 [„GLOBAL REACH: WILL THE TACTILE INTERNET GLOBALIZE YOUR SKILL SET?”](#) by Mischa Dohler
- IEEE ComSoc Training 2017, [„The Tactile Internet”](#) by Frank Fitzek and Gerhard Fettweis
- IEEE 5G Summit Dresden 2016, 2017
- IEEE Globecom 2018, Tactile Internet Track within the Selected Areas of Communications Symposium, ACCEPTED!!
  
- Please, link the event’s website to the TI committee website so the workshop can be counted to be supported by the TI committee



# Report of the Chair

## ► Highlights of the IEEE 5G Summit



# Report of the Chair

- ▶ Multiple projects on the Tactile Internet have started in:
  - Germany
  - Sweden
  - Finland
  - USA
  - ...
- ▶ We are expecting to receive high quality results and contributions



# Report of the Chair

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## Tactile Internet

### Guest Editors

- Gerhard Fettweis, Technical University Dresden, Dresden, Germany
- Meryem Simsek, International Computer Science Institute (ICSI), Berkeley, USA
- Chih-Lin I, China Mobile Research Institute, Beijing, China

Submission Deadline: December 30, 2017

Publication Date: 2018

Within the past few years, the Tactile Internet has seen an explosive growth of interest in the wireless communication society for enabling remote control in perceived real-time within an underlying fifth generation (5G) network. The purpose of this special issue is to assemble and publish recent research on the Tactile Internet and related research within the 5G of communication networks to realize the Tactile Internet. The articles in this special issue will cover a range of topics, including techniques to achieve key requirements of emerging use cases with 5G communication networks. Further focus will be on the architecture design of the Tactile Internet and the wireless edge, human-in-the-loop and machine-in-the-loop use cases, physical layer solutions for low-latency and high-reliability, and

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## IEEE JOURNAL ON SELECTED AREAS IN COMMUNICATIONS

**Full paper submission:** April 1, 2018  
**Author notification:** August 1, 2017  
**Camera-ready version:** September 15, 2018  
**Expected publication:** November 2018

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### EMERGING TECHNOLOGIES IN TACTILE INTERNET AND BACKHAUL/FRONTHAUL NETWORKS

#### CALL FOR PAPERS

#### IEEE JSAC Special Issue on Emerging Technologies in Tactile Internet and Backhaul/Fronthaul Networks

##### Scope

Mobile communications networks of today have successfully connected the vast majority of the global population. With this technological advancement, the stage is set for the emergence of two trends: (a) the **Tactile Internet**, in which ultra-reliable and ultra-responsive network connectivity will enable the real-time control and tactile experiences to remote users, and (b) smart **backhaul/fronthaul** designs that are integrated and flexible to support the demands of next-generation applications.

The Tactile Internet will underpin the internet of skills, which, in turn, will provide a true

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# Report of the Chair

- ▶ GOOD NEWS: The ETC agreed to promote the Tactile Internet SUB-committee to become a technical-committee within ComSoc!!
- ▶ The TEA- Council approved this motion today!
- ▶ We are moving on...

# Report of the Chair

- ▶ Standardization activities:
- ▶ ETSI: Work item on IPv6 based Tactile Internet within the ISG IPv6
  - Lead by Meryem Simsek
  - Supported Toshiba Research Europe
  - Final version under review
- ▶ IEEE:
  - IEEE P1918.1 working group on the Tactile Internet continues activities
  - IEEE P1918.1.1 Haptic Codecs group has defined the requirements for haptic codecs and continues its activities

# Teaser Talks

- ▶ Toktam Mahmoodi, King's College London, UK

# Other Business

- ▶ Total number of subscribers to the mailing list: 127 (It was 120 in May'17!)
- ▶ Suggestions for improvements?
- ▶ Further ideas?