



Agenda

- ▶ Welcome & Introduction
- ▶ Approval of the agenda
- ▶ Highlights of the GC 2020 meeting
- ▶ Approval of the meeting minutes
- ▶ Background about TI TC
- ▶ Discussion on new activities
- ▶ Project presentations
- ▶ Report on standards activities
- ▶ Report on conferences and publications
- ▶ Planning activities for 2021-2022
- ▶ Any other business

Participation in the TI TC Online Meeting

- ▶ Please, fill out the following form to indicate your participation at the meeting (link will be provided in the chat box)

<https://forms.gle/pNHWecAXAS6XMiMx9>

- ▶ This is extremely important to track your participation in our meetings

How to Join the TI TC?

- ▶ We hold two meetings every year:
 - At ICC and Globecom
 - <https://ti.committees.comsoc.org/>
- ▶ Become a member by joining our mailing list:
 - <https://ti.committees.comsoc.org/ mailing-list/>
- ▶ You are an active member if you have attended two or more of the prior five regularly scheduled TC meetings
- ▶ You are a voting member if you are an active member or have substantially contributed to the TI Technical Committee activities

Highlights of the Globecom 2020 Meeting

- ▶ Meeting was online and chaired by Meryem Simsek
- ▶ Discussed items:
 - Discussion on new activities
 - Report on awards
 - Report on conference and publication activities
 - Planned activities for 2020 – 2022, e.g., start special interest groups and online webinars
 - Dr. Holland presented updates on TI standards

Brief History of the TI TC

- ▶ Started as a technical sub-committee in June 2015 with
 - Meryem Simsek, Latif Ladid, and Mischa Dohler as officers
- ▶ Summer 2018 evaluated to a TC with
 - Meryem Simsek, Falko Dressler, Oliver Holland as officers
- ▶ Initiated an IEEE standardization working group on the Tactile Internet, IEEE P1918.1
- ▶ Organized various workshops, tutorials, special sections, tracks in flagship conferences as well as various special issues in IEEE journals
- ▶ Highly active and engaged members with very interactive meetings including guest speakers

Tactile Internet Definition

- ▶ Standardized definition:

"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."

Tactile Internet TC Charter

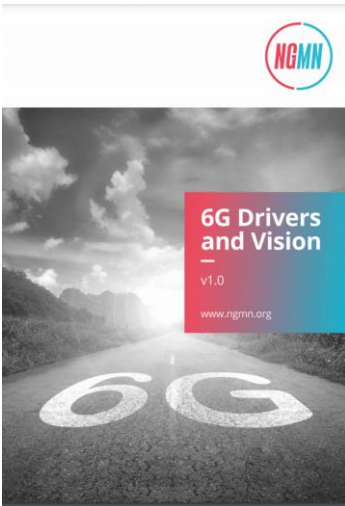
- ▶ The objectives of the TI technical committee are to facilitate the worldwide harmonization of **research, standardization** and **best practices** for deployment user scenarios of the global **TI ecosystem**, to design the built-in security and privacy and to explore ways the tactile technology can be realized in different segments such as in engineering, automobile, transport and logistics, health service, and public. The TI technical committee will target the understanding of the tactile **requirements**, defining **system specifications** to meet these requirements, and developing **breakthrough technology** to the identified challenges of the tactile internet.

Tactile Internet is Gaining Momentum with 6G



RINGS

Merging digital/physical/virtual worlds



https://www.ngmn.org/wp-content/uploads/NGMN-6G-Drivers-and-Vision-V1.0_final.pdf

DFG Deutsche
Forschungsgemeinschaft

Priority Programme “Resilience in Connected Worlds – Mastering Failures, Overload, Attacks, and the Unexpected (Resilient Worlds)” (SPP 2378)

Many keynotes from major
drivers and companies

Mixed reality

Holograms

Internet of Senses

Immersive
Experiences

HCI

...



Report on Activities

- ▶ Tactile Internet track within SAC Symposium at IEEE Globecom 2018, 2019, 2020 and IEEE ICC 2020
- ▶ Sponsoring other symposia at ICC and Globecom, e.g. Next-Generation Networking & Internet, IoT & Sensor Networks
- ▶ Organization of various workshops, tutorials, special sessions and special issues (most of the online)
- ▶ Sponsoring of other conferences, e.g., COMSNETS 2021, ICT 2021
 - Endorsement of conferences → please reach out to us!



Deadline
September 30th



Nominate Yourself or a Colleague for the
2022-2023 ComSoc **Distinguished Lecturer**
Program

Report on Activities

- ▶ Worldwide new TI centers/research groups are opening, e.g., Canada, Germany, UK, Abu-Dhabi, Lebanon, and the USA
- ▶ Standardization activities are ongoing, first standards draft ready for a ballot
- ▶ Engagement with other TCs, e.g., IoT, Ad Hoc & Sensor Networks, Information Infrastructure & Networking, Network Intelligence (ETI)
 - Online meetings on a new joint SIG on “IoT and the Tactile Internet” with the IoT-AHSN TC
- ▶ Currently updating TI TC’s P&Ps according to IEEE ComSoc P&P updates
- ▶ Nominations for annual awards under preparation
- ▶ Discussion with other IEEE societies for joint activities

Report on Awards

- ▶ As a part of the TI activities, *Service Award* and *Technical Contribution Award* are established
- ▶ Current awards subcommittee:
 - Sharief Oteafy, DePaul University
 - Falko Dressler, TU Berlin
 - Neeraj Kumar, Thapar Institute of Engineering and Technology India
 - Frank Fitzek, TU Dresden
 - Stefano Giordano, Universita di Pisa

Report on Activities

- ▶ Publications and Journal activities
 - Various activities, i.e., journal special issues (detailed in slides 44-46)
- ▶ The website has been updated
 - A new tab on ,Best readings` has been added
 - List of various articles has been added
 - Hint to contact the officers for listing a related article
 - Meetings including slides and minutes are uploaded
 - Awards tab has been updated with the new awardees
- ▶ Support of the IEEE ComSoc student competition

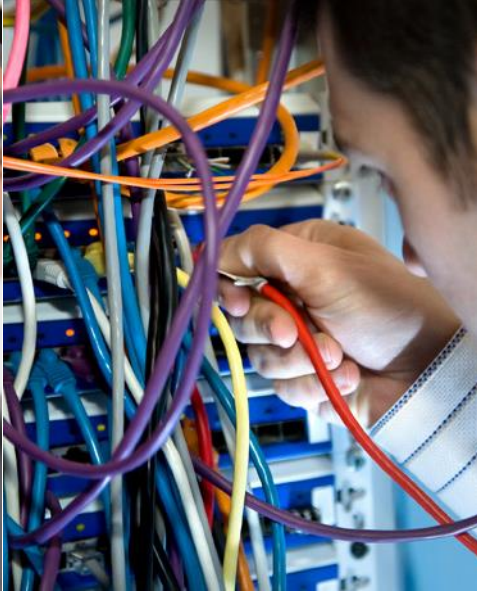
New SIG on IoT in the Tactile Internet

- ▶ Together with the IoT, Ad Hoc & Sensor Networks TC a cross-TC SIG has been formed on “IoT in the Tactile Internet”
- ▶ The SIG activities will be coordinated by Dr. Sharief Oteafy (soteafy@depaul.edu) from DePaul University and Dr. Nikolaos Pappas (nikolaos.pappas@liu.se) from Linköping University
- ▶ An online kick-off meeting in June 23rd 2021 with an invited talk on “Cyber-Physical-Social Systems (CPSS) in the 6G Era: From Tactile Internet to Internet of No Things” by Martin Maier
- ▶ Please, reach out to Sharief Oteafy and/or Nikolaos Pappas in case of interest

Webinar Series

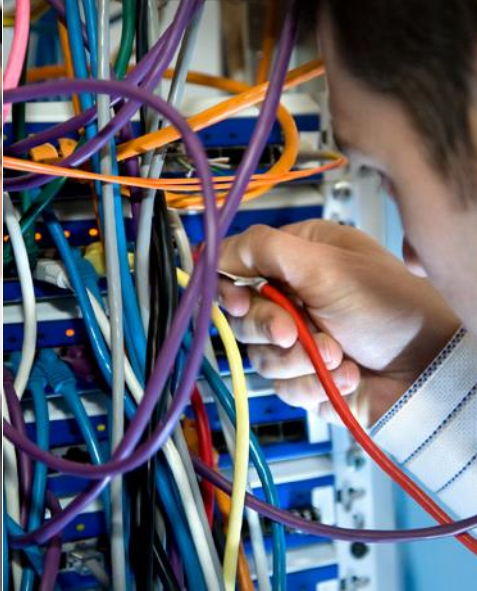
Started a webinar series with experts from diverse backgrounds:

- ▶ Shu-Chen Li, Psychophysical and Neurocognitive mechanisms of Multisensory Perception across the Lifespan: Implications for TI Technologies, Technical University Dresden, June 7th, 2021
- ▶ Stefanie Speidel, AI-assisted Surgery, National Center for Tumor Diseases, June 25th, 2021
- ▶ Harold Dumur, Spatial Computing and Gaming, OVA.ai, August 2021
- ▶ Stefano Giordano, Active Fluid Dynamics, Universita di Pisa, tbd
- ▶ Ugo Boggi, Remote Surgery with Da Vinci Robots, Universita di Pisa, tbd
- ▶ Charles Goin-Valleran, Mixed Reality and Spatial Reasoning , University of Sherbrooke, September 2021









Report on Standards Activities

▶ IEEE:

- IEEE P1918.1 working group on the Tactile Internet continues activities. Close to finalizing the draft standard, as is the last item needed before completion towards balloting. There have been recent significant contributions to the use cases and architecture within IEEE P1918.1.
- IEEE P1918.1.1 Haptic Codecs group has completed definition of its zero-delay and delay-bounded kinaesthetic codecs. In the final stages of choosing its tactile codec among 2 proposals.

Report on Conference Activities

- 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 \(5G TACNET\)](#)"
- IEEE Globecom 2018: Workshop on "[Ultra-Reliable and Low-Latency Communications in Wireless Networks \(URLLC\)](#)"
- IEEE Globecom 2018, 2019, 2020 and IEEE ICC 2020: TI track in Selected Areas of Communications (SAC) Symposium
- Starting 2021, co-sponsoring the symposia on Next-Generation Networking & Internet, IoT & Sensor Networks

Report on Conference Activities

- Workshops and Special sessions:
 - ISWCS 2021 special session on Tactile Internet
 - ISWCS 2021 special session on Age of Information
 - ISWCS 2021 special session URLLC & Industrial Networking
 - Globecom 2021 Workshop on Intelligent Communications for Decentralized Energy Management
 - IEEE CCNC 2021, several workshops and sessions

Report on Conference Activities

- Tutorials:
 - IEEE HPSR Blockchain for Sustainable Energy Management Systems
 - IEEE Globecom, CIC ICCA Age of Information
- Special Issue:
 - IEEE Network, Special Issue on "Managing Next-Generation Networks for Intelligent Services and Applications".
 - Cluster Computing, Special Issue on "Emerging AI-supported Wireless Defense Systems for Edge Computing Networks"
 - IEEE Internet of Things Journal, Special Issue on "Age of Information and Data Semantics for Sensing, Communication and Control Co-Design in IoT"
 - IEEE Access: Software-Defined Networks for Energy Internet and Smart Grid Communication
 - Frontiers in Communications and Networks, Special Issue on "Age of Information"
 - EURASIP JWCN (open): Future of Wireless Access for Industrial IoT (FutureIIOT): enabling Industry 4.0 with TI as explicit topic

Planning Activities for 2021-2022

- ▶ Increase #membership and participation
- ▶ Increase #tutorials, special issues, distinguished lecturers
- ▶ Involve our members from various regions
- ▶ Open calls for participation to the TI TC activities will be continued
- ▶ Additional special interest groups should be launched
- ▶ Engagement with other TCs and societies
- ▶ Additional (inter-disciplinary) webinars will be organized
- ▶ Introduction of a newsletter

Other Business

- ▶ Total number of subscribers to the mailing list
~200↑
- ▶ Website administration
- ▶ Publicity activities & newsletter
- ▶ Suggestions for improvements?
- ▶ Further ideas?