IEEE ComSoc Tactile Internet Technical Committee

ICC 2023 Virtual Meeting

Falko Dressler <dressler@ccs-labs.org>

Stefano Giordano <stefano.giordano@unipi.it>

Nikolaos Pappas <nikolaos.pappas@liu.se>

Agenda

- Welcome & Introduction
- Approval of the agenda
- Highlights of the GC 2022 meeting
- Approval of the meeting minutes
- Background about TI TC
- Report on activities
- Report on standards activities
- Project presentations
- Planning activities for 2023/2024
- 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/gfn5iZYW8QKdPLvs7

- 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 GC 2022 Meeting

- Meeting was online and chaired by Falko Dressler

- Discussed items:
  - Discussion on new activities
  - Report on conference and publication activities
  - Planned activities
  - Newsletter

- Motion to approve the meeting minutes:

  https://ti.committees.comsoc.org/meetings/

IEEE
Advancing Technology
for Humanity

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

- Elections 2022, new officers
  - Falko Dressler, Stefano Giordano, Nikolaos Pappas
  - Meryem Simsek as past chair

- 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

◆IEEE
Advancing Technology
for Humanity

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.

TI is Gaining Momentum with 6G, XR/MR and the Metaverse

NSF

RINGS

Merging digital/physical/virtual worlds

DFG Deutsche Forschungsgemeinschaft

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

NGMN

6G Drivers and Vision
v1.0
www.ngmn.org

6G

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

Many keynotes from major drivers and companies

Mixed reality

Holograms

Internet of Senses

Immersive Experiences

HCI

...

IEEE
Advancing Technology for Humanity

Research Highlights

Research Highlights

- Prof. Qi Zhang (Aarhus University), coordinator of the doctoral network, funded by the European Union's Horizon Europe research and innovation programme:
TOAST: *Touch-enabled Tactile Internet Training Network and Open Source Testbed*

- Prof. Matteo Bianchi (University of Pisa), expert in haptics, haptic interfaces, human-robot interaction

Report on Activities

General Overview of TC Activities

- Conferences
  - Sponsorship of symposia – nominations for symposium co-chairs
  - Endorsement of conferences
  - Sponsorship of workshops, special sessions, tutorials
- Nominations
  - Distinguished lectures
  - IEEE Senior/Fellow membership status
- Awards
  - Annually two awards: service award and technical contribution award
- Student competition
- Standardization activities
- Webinars
- Publications, e.g., Special issues, books
- Newsletter
- Collaborations with other TC/societies

General Overview of TC Activities

- GC 2024 symposium chair positions
  - Decisions to be taken by GC 2024 TPC chairs

- ICC 2025 call for nominations
  - Sent Mid April 2023

Report on Awards

- As a part of the TI activities, *Service Award* and *Technical Contribution Award* are established

- Current awards subcommittee:
  - Stefano Giordano, Universita di Pisa (chair)
  - Oliver Holland
  - Zaher Dawy
  - Sharief Oteafy
  - Nikolaos Pappasx

Tactile Internet TC Newsletter

- Newsletter
  - Guodong Zhao (Guodong.Zhao@glasgow.ac.uk) appointed as lead editor

  - Call for contributions is ongoing
  - Opportunity to:
    - disseminate your achievements within the TI community
    - Engage with the TI community
    - Share your upcoming events, openings etc. Within a global team
  - Please, submit your content!

  - First newsletter published
  - Second newsletter ready
  - https://ti.committees.comsoc.org/newsletter/

Publication Activities

- Special issues:
  - IEEE Internet of Things Journal "Age of Information and Data Semantics for Sensing, Communication and Control Co-Design in IoT", Published Oct. 2021.
  - Frontiers in Communications and Networks, Special Issue on "Age of Information"
  - IEEE Communications Standards Magazine „Autonomous Nteworks: Opportunities, Challenges, and Applications"
  - IEEE Network „Zero Touch Networks: Opportunities, Challenges, and Potential Applications"

  - IEEE Network „Tactile Internet"

Engagement/Collaboration with other TC/Societies

- 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
- Engagement with IEEE ComSoc SCV chapter
  - Joint webinars and other activities
- Engagement with IEEE Computer Society SCV chapter
  - Joint webinars (e.g., NFIC – next frontiers in computing) and other activites
- Collaboration with IEEE Robotics and Automation Society Telerobotics TC
  - Standardization
  - Joint Special Issues, e.g., IEEE Transactions on Human-Machine Systems
  - Joint Workshops and/or webinars
  - Joint SIG?
- Discussion with other TCs from other IEEE societies ongoing
- Organization of online webinars in collaboration with the IEEE ComSoc SCV and IEEE Computer Society SCV chapters

SIG Activities

- SIG: IoT in the Tactile Internet
  - Together with the IoT, Ad Hoc & Sensor Networks TC a cross-TC SIG has been formed
  - The SIG activities are coordinated by Dr. Sharief Oteafy (soteafy@depaul.edu) from DePaul University and Dr. Nikolaos Pappas (nikolaos.pappas@liu.se) from Linköping University

- Other SIGs currently under discussion
  - Please, reach out to us in case you are interested to lead a SIG activity

◆IEEE
Advancing Technology
for Humanity

Webinar Series

- Started a webinar series with experts from diverse backgrounds
  - Roughly once a month, at 18:00 CET or CEST
  - Stay tuned for updates!

- Task-Oriented Cross System Design for Metaverse in the 6G Era
  - April 19th, 2023 | **Prof. Philip Guodong Zhao** (University of Glasgow, UK)
- Is the Internet ready to be tactile?
  - March 15th, 2023 | **Prof. Matthias Wählisch** (Freie Universität Berlin, Germany)
- Semantics-aware Goal-Oriented Communications: Age of Information and beyond
  - January 25, 2023 | **Prof. Nikolaos Pappas** (Linköping University, Sweden)
- 6G and Onward to Next G: Virtual Immortality, Eternal Life, and Other Metaverse Pastimes
  - December 14, 2022 | **Prof. Martin Maier** (National Institute for Scientific Research, INRS, Canada)
- Networked Cyber-Physical Systems for automotive applications
  - October 19, 2022 | **Prof. Stefano Giordano** (Università di Pisa, Italy)
- From Network Softwarization to In-Network Computing
  - September 28, 2022 | **Prof. Giang T. Nguyen** (CeTI, TU Dresden, Germany)

IEEE
Advancing Technology
for Humanity

Report on Standards Activities

- IEEE:
  - Both groups meeting monthly to discuss updates; additional ad-hoc meetings are schedule upon need
  - 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 kinaethetic codecs.

ComSoC TC Restructuring
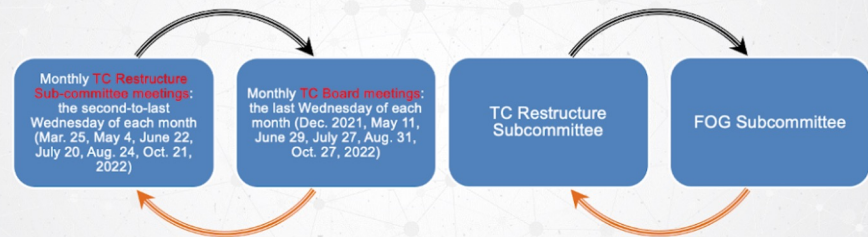
TC Restructure (update & draft)

Why Should We Restructure the TCs?

- Lack of industry participation
- Lack of diversity in YP & Students members
- Lack of coordination to form SIGs
- Lack of support for local chapters globally
- Lack of support for standard development
- Lack of educational services to members
- Lack of guidelines in creating TC awards
- Significant overlapping areas among some TCs

What we've done in 2022?

Iterative Procedure

▸ Iterative procedure to involve TCs/ICs in the process:

Monthly **TC Restructure Sub-committee meetings**: the second-to-last Wednesday of each month (Mar. 25, May 4, June 22, July 20, Aug. 24, Oct. 21, 2022) → Monthly **TC Board meetings**: the last Wednesday of each month (Dec. 2021, May 11, June 29, July 27, Aug. 31, Oct. 27, 2022) → TC Restructure Subcommittee → FOG Subcommittee

All meeting docs and slides are available at: https://tc.boards.comsoc.org/meeting-documents/

Your feedback is very important to us!

Please send your comments to
Shiwen Mao, TC Board Director, E-mail: smao@ieee.org
Wei Zhang, VP TEA, E-mail: weizhang@ieee.org

◆IEEE
Advancing Technology for Humanity

Planning Activities for 2023/2024

- 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 to be launched

- Engagement with other TCs and societies

- Additional (inter-disciplinary) webinars will be organized

- Social media engagement

◆IEEE
Advancing Technology
for Humanity

Summary of Call for Action/Inputs

- Input for newsletter. Please, reach out to Guodong.Zhao@glasgow.ac.uk

- Updates on activities, e.g., publications, webinars, workshops, tutorials, SIs, SSs, …

- Engagement with your local chapters

- Call for invited talks for the webinar series!

Other Business

- Total number of subscribers to the mailing list ~210

- Website administration

- Publicity activities, e.g., social media

- Suggestions for improvements?

- Further ideas?