

TC ANNUAL REPORTING FORM

IMS Technical Committee

TC-20 Transportation Systems in Measurements

Reporting period

01/01/19

31/12/19

12/05/20

Starting date (dd/mm/yy)

Ending date (dd/mm/yy)

Date of submission (dd/mm/yy)

Website <http://ieee-ims.org/technical-committees>

Last update
(mm/yy)

TC Chair or co-Chairs

First Name	Second Name	Family Name	Affiliation /Address	Membership number	Phone	e-mail address	Date of election
Georg		Brasseur	Graz University of Technology			Georg.brasseur@tugraz.at	
Thomas		Bretterklieber	Graz University of Technology				
Anton		Fuchs	Virtual Vehicle Competence				

Secretary (check the right box)

Present

Not Present

First Name	Second Name	Family Name	Affiliation /Address	Membership number	Phone	e-mail address	Date of election

TC Membership list^(*)

First Name	Second Name	Family Name	Affiliation /Address	Country	Phone	e-mail address	TC assignments (joining year)
Georg		Brasseur	Graz University of Technology	Austria		Georg.brasseur@tugraz.at	

* Please add as many rows as needed

Thomas	Bretterklieber	Graz University of Technology	Austria	Thomas.bretterklieber@tugraz.at
Anton	Fuchs	Virtual Vehicle Competence	Austria	Anton.fuchs@v2c2
Lee	Barford	Keysight Laboratories, Reno	USA	lee_barford@ieee.org
Daniel	Watzenig	Virtual Vehicle Competence	USA	Daniel.Watzenig@v2c2.at
Voicu	Groza	University of Ottawa	Canada	vgroza@uottawa.ca
David	Hastie	University of Wollongong	Australia	dhastie@uow.edu.au
Gert	Holler	NXP	Austria	gert.holler@gmx.at
Olaf	Kanoun	Technische Universität Chemnitz	Germany	olfa.kanoun@etit.tu-chemnitz.de
Abdulmotaleb El	Saddik	University of Ottawa	Canada	elsaddik@uottawa.ca
Christian	Schuss	Universität Oulu	Finland	christian.schuss@ee.oulu.fi

* Please add as many rows as needed

TC mission – field of expertise (max. 1000 char. Including spaces)

Usually students collaborate in the scientific R&D work carried out by TC-20 members. The collaboration educates students in the TC field, TC-20 members profit from the legwork provided by the students during the R&D work and TC-20 members recruits new members for the I&M society. TC-20 bundles basic research activities, models, develops, promotes and applies measurement systems with energy and processing power limitations for and in transportation systems operated at harsh environments like oil well exploration, heavy industry and automotive.

- 2-D and 3-D tomographic flow measurement of transport processes,
- Nanoparticle flow sensing,
- Predictive maintenance at small and large combustion engines,
- Alternative energies vehicles and driver assist systems,
- Power measurements for electrical drivetrains.
- Provides forums such as workshops and symposia where such technologies can be discussed
- Maintains liaison with other societies and organizations working in the same or related areas.
- Develops and promotes sensor data processing, interpretation and fusion in
 - Alternative energies vehicles and driver assist systems,
 - Power measurements for electrical drivetrains,
 - Predictive maintenance at small and large combustion engines,

Transportation Systems in Measurements for

- Resource limited applications: energy and processing power
- Indirect measurements as the measurand can't be measured directly
- Harsh environments like automotive, heavy industry and oil well exploration
- Incorporating TC-20 member know-how into University lectures and curricula
- Electric, connected, automated (ECA) systems

TC meetings in the reporting period^(*)

Date (dd/mm/yy)	Online / Face2Face	Attendance (number)	TC Members	Information sent within 4 months to (Yes/No)		
				Chair of TSAC	IM Magazine	Other (specify)

Minutes of the yearly meeting (separate file)¹:

¹Yes/No, date of the yearly meeting;

* Please add as many rows as needed

Participation in Society sponsored Events (Conferences, Symposia, Workshops) (*)

Name of the Event	Starting date (event) (dd/mm/yy)	Ending date (event) (dd/mm/yy)	Date Participation (dd/mm/yy)	Type of participation (Yes/No)			
				Sponsorship	Session	Tutorial	Other (specify) ²

Involvement in standard development(*)

So far we are not involved in IEEE standards development.

Maybe transportation systems in measurements has the potential for standardizing specific hardware setups coupled to measurement procedures (algorithms). This aim was not in the TC-20 focus until now. It would be hard to save some time to move into this direction.

Members of TC-20 are involved in two emerging standards on reliability and fault-tolerance of autonomous products covering both instrumentation hardware and embedded software. These are the ISO PAS 21448 on safety of the intended functionality (SOTIF) and the UL4600 (Carnegie Mellon and Edge Case Research are the initiators) on developing safe autonomous products (all kind of vehicles and transport systems)

Participation in the development of Society Educational Programs(*)

Program name	Involvement of chapters and sections	Activity in the reporting period, including dates	Notes, attendance
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Other Activities (tutorials, teaching, career, cooperation, publications, joint activity with chapters or sections) (*)

Interaction with other societies in IEEE:

PELS, Sensors Council, Vehicular Technology (VTS), Intelligent Transport Systems (ITSS)

Existing support being provided by the committee to conferences:

Committee members write papers and review papers for IEEE IMS conferences, in November 2019 the Int. Conf. on Connected and Automated Vehicles and Expo (ICCVE'19) was held for the first time with IMS as financial sponsor (ITSS as technical sponsor). Members from IEEE Austria and TC-20 did initiate this conference which will be continued by IMS every second year. The conference attracted a lot of patrons and speakers from the industry as well as public authorities and legal affairs.

Existing support being provided by the committee to publications (IMS Magazine and TIM):

No article published in IMS Magazine within the last 10 years but authors being member of TC-20 publish in TIM.

Industry links:

Numerous companies (OEMs, Tier 1 suppliers, I&M companies and semiconductor companies)

TC-20 Industrial and Academic Collaborations

- Monitoring of pneumatic conveying processes using electrical capacitance tomography. Ongoing academic and industrial cooperation with the Christian Doppler Laboratory on Particulate Flow Modelling (JKU/ Linz) and Voestalpine / Steel division and the Institute of Electrical Measurement and Sensor Systems (EMS/Graz). 2-D and 3-D tomographic flow measurement of transport processes.
- Instrumentation of Electric Drivetrains for Power Measurement Model based assessment of the measurement chain, sensor development, designing and manufacturing isolated high voltage probes and shunt sensors.
- Workshop on predictive maintenance for small combustion engines.

* Please add as many rows as needed

- Workshop on state estimation in engines
- Seminar on “The World of Nanoparticle Analysis” with TSI GmbH. Analysis of particles, measurement methods for particle emissions of motor vehicles and challenges of particle sensors for vehicles in general
- Collaboration with the Stanford University (autonomous systems including vehicles and drones), Florida State University (Battery modeling, thermal dynamics), UC Berkeley (intelligent transport systems)
- TC-20 members also contributed to the new European framework starting by 2021 ('Horizon Europe'). Two strategic research agendas have been influenced: European Green Deal "ToZero" and the Electronic Components and Systems (ECS) Innovation Plan

Recommended candidates^(*)

Type (ADCOM, Fellow, Award –specify-)	First Name	Second Name	Family Name	Affiliation /Address	Motivation
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² For example, Involvement in reviewing papers (and indicate approximate number of paper reviews for the listed event)

TC operating Plan: near-term plans for the upcoming year, including scheduled meetings, activities, and so on (max. 1000 char. Including spaces)

TC-20 Knowledge Transfer & Teaching

- Dedicated academic lectures and lab course program on measurement and measurement signal processing for transport systems in measurement
- Seminar on Nanoparticles: From Pollution to Energy Applications, TU Graz together with Adam Boies, University of Cambridge

Development of initiatives

- Development of a lecture at Graz University of Technology in the TC-20 field.
- ICCVE 2019+ is the new application-oriented conference of IMS (initiated by TC-20) to be held every two years. Main focus: Instrumentation, measurement, and processing topics of electric, connected, automated future transport

TC operating plan: long term vision from 2-5 years out, based on IMS Strategic Plan, including areas of strength, areas for improvement, how is the subject area going to change, planned actions for lifting achievement succession plans etc. (max. 1000 char. Including spaces)

The TC-9 SCS bundles research activities in the field of capacitive sensing and their application in industrial environments.

Research activities in the field of capacitive sensing:

- Develop, promote and support capacitive sensor-related technologies, user applications
- Develop new methods to meet industry's need for cost efficient, robust, reliable and accurate sensors
- Review capacitive sensors and their applications in the user community, government and industry

* Please add as many rows as needed



- Provide forums such as workshops and symposia where such technologies can be discussed
- Maintain liaison with other societies and organizations working in the same or related areas

Industrial and Academic Collaborations:

- Introducing Electrical Capacitance Tomography to industrial applications
- Expanding the global academic partner network; new partners found e.g. at Indian Institute of Technology Madras, University of Bayreuth etc.

Knowledge Transfer for Capacitive Sensing:

- Guest lectures on sensor modeling and simulation of capacitive sensors in several master programs
- Tutorials at relevant conferences (e.g. I2MTC)

TC convergence, synergy, cooperation with other TC, from I&M or other societies (max. 1000 char. Including spaces)

Picking research topics at the borderline between two or more IMS TCs to foster collaboration and student exchange.

Close cooperation between members of TC-20 "Transportation Systems in Measurements" and TC-9 SCS

Comments/Suggestions (max. 1000 char. Including spaces)

* Please add as many rows as needed