SAM TC Meeting @ ICASSP 2021

Wei Liu

Tuesday, 18 May 2021
9:00am – 11:00am EDT
Virtual Meeting via WebEx

IEEE Advancing Technology for Humanity

IEEE Signal Processing Society

Agenda

- 1. Welcome
- 2. Report from Chair (Part 1)

  Membership Update

  DIS and DL, and SPS Awards
- 3. Workshop Reports

  SAM 2020, Hangzhou, (Zhiguo Shi, Martin Haardt)

  CAMSAP 2021/2023, Costa Rica (Martin Haardt, André L.F. de Almeida, Rémy Boyer)

  SAM 2022, Trondheim, Norway (Pierluigi Salvo Rossi, Stefan Werner)
- 4. Proposals requested for

  SAM 2024

  CAMSAP 2025 (?)
- 5. SPS Activities

  Synthetic Aperture TWG (Peter Vouras)

  TWG Integrated Sensing and Communication (Tsung-Hui Chang)

  Unified EDICS
- 6. Report from Chair (Part 2)

  ICASSP 2021 (SAM TC Area)

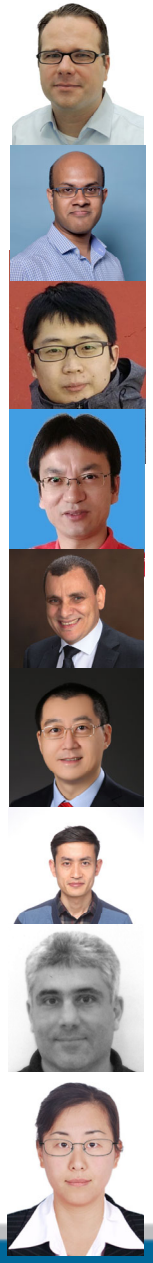
  TC status/review
- 7. Subcommittee Reports
- 8. Discussion about Initiating Possible Online Lecture Series
- 9. Miscellaneous (Job Posting, etc.)

IEEE Signal Processing Society

2: SAM Membership 2021

New Members

- Felix Antreich, Aeronautics Institute of Technology, Brazil
- Sundeep Chepuri, Indian Institute of Science, India.
- Xiao Fu, Oregon State University, USA.
- Yujie Gu, Aptiv-Advanced Safety and User Experience, USA.
- Aboulnasr Hassanien, Wright State University, USA.
- Gang Li, Tsinghua University, China.
- Jun Liu, University of Science and Technology of China, China.
- Peter Vouras, National Institute of Standards and Technology, USA.
- Xiangrong Wang, Beihang University, China.



Retiring Members (Dec 2020)

- Fulvio Gini
- Jarvis Haupt
- Eduard Jorswieck
- Frederic Pascal
- Brian Sadler
- Ba-Ngo Vo
- Birsen Yazici
- Yimin Zhang

Returning / Re-Elected

- Angeliki Alexiou (2nd term)
- Alexander Bertrand (2nd term)
- Nuria Gonzalez Prelcic (2nd term)
- Gonzalo Seco-Granados (2nd term)

Statistics

- 14 R1-6, 1 R7, 14 R8, 3 R9, 9 R10
- 4 Industry/Lab, 37 Academic
- 9 female, 32 male

IEEE Signal Processing Society

SAM Membership Structure 2021

- In total 41 regular members (including our current past chair Christoph Mecklenbräuker).
- Six Advisory Members (our past chairs): maximum one third of the regular membership.
- 20 Associate Members: maximum half the size of the regular membership.
- Affiliate Members: 141 (including 26 students).

Six Advisory Members

- Prof. Kon Max Wong, McMaster University, Canada
- Prof. Michael Zoltowski, Purdue University, USA
- Dr. Kristine L. Bell, Metron, USA
- Prof. Dominic K. C. Ho, University of Missouri, USA
- Prof. Peter Willett, University of Connecticut (CT), USA
- Prof. Martin Haardt, TU Ilmenau, Germany

2020 SAM Awards

10 TC Nominations, two selected for award:

Carl Friedrich Gauss Education Award awarded to **Louis Scharf**
for sustained contributions to education and mentorship in statistical signal processing.

IEEE SPS Young Author Best Paper Award awarded to
Bo Li, Athina Petropulu, and Wade Trappe
"Optimum Co-Design for Spectrum Sharing between Matrix Completion Based MIMO Radars and a MIMO Communication System," IEEE Transactions on Signal Processing, vol. 64, no. 17, pp. 4562-4575, Sept 2016

2021 Distinguished Lecturers of the IEEE SPS and their Topics

2021 Class of DL: 1 Nomination (Konstantinos Diamantaras), 0 selected

2021 Class of DIS: 0 Nominations

2021 Distinguished Lecturers
Pier Luigi Dragotti
Karen Livescu
Venkatesh Saligrama
Dimitri Van De Ville
Dong Xu

2021 Distinguished Industry Speakers
Achintya K. Bhowmik
Chienchung Chang
Mérouane Debbah
Dilek Hakkani-Tür
Xiaodong He

For 2022 Class of DL: Two candidates Yingbo Hua and Sergiy A. Vorobyov. Please vote (today is the deadline)

3: SAM TC Workshop Reports

- **SAM 2020**
  - ⇒ Hangzhou, China (Zhiguo Shi and Martin Haardt)
- **CAMSAP 2021/2023**
  - ⇒ Costa Rica (Martin Haardt, André L.F. de Almeida, Rémy Boyer et al.)
- **SAM 2022**
  - ⇒ Trondheim, Norway (Pierluigi Salvo Rossi, Stefan Werner)

IEEE Signal Processing Society

The 11-th IEEE Sensor Array and Multichannel Signal Processing Workshop (SAM 2020)

SAM TC Report

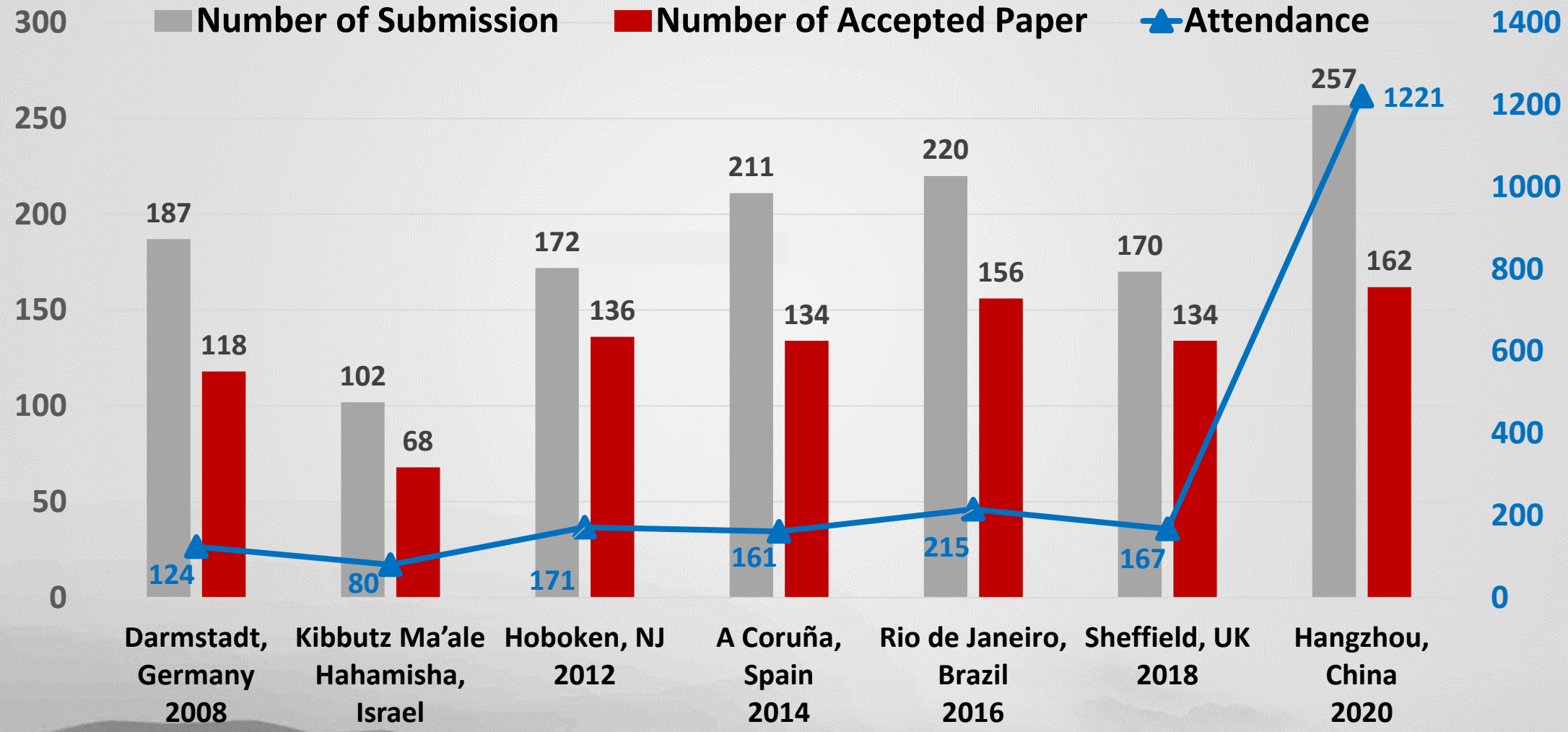
Hangzhou, China

(Fully Virtual Conference)

June 8 – 11, 2020

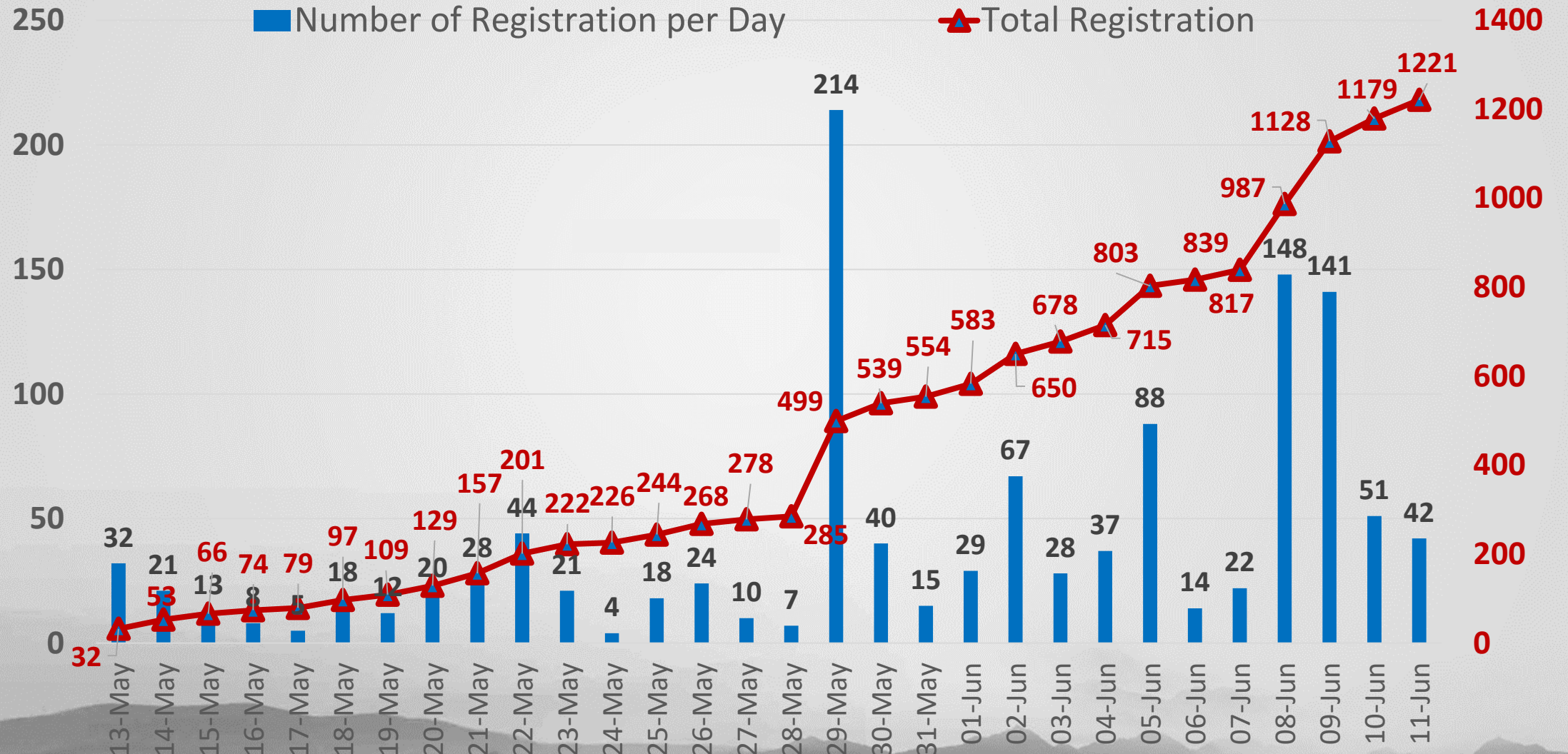
http://www.sam2020.cn/

Conference Statistics



Record Number

Conference Statistics (Number of Registrations)



Conference Statistics

Registration Type

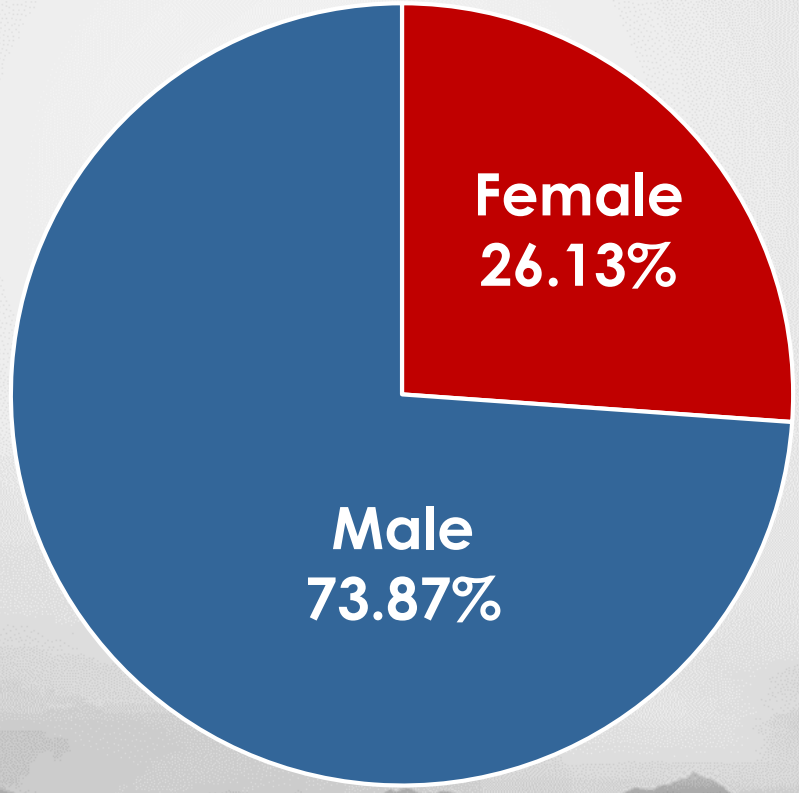
Total Registration	Author	Non-Author
1221	113	1108

- **Only** the authors that require to cover the accepted papers should select Author Registration (Paid Registration)
- One Paid Registration can cover up to **Four** papers
- The Non-Author Registration are **free** to encourage the participation enthusiasm for the virtual conference

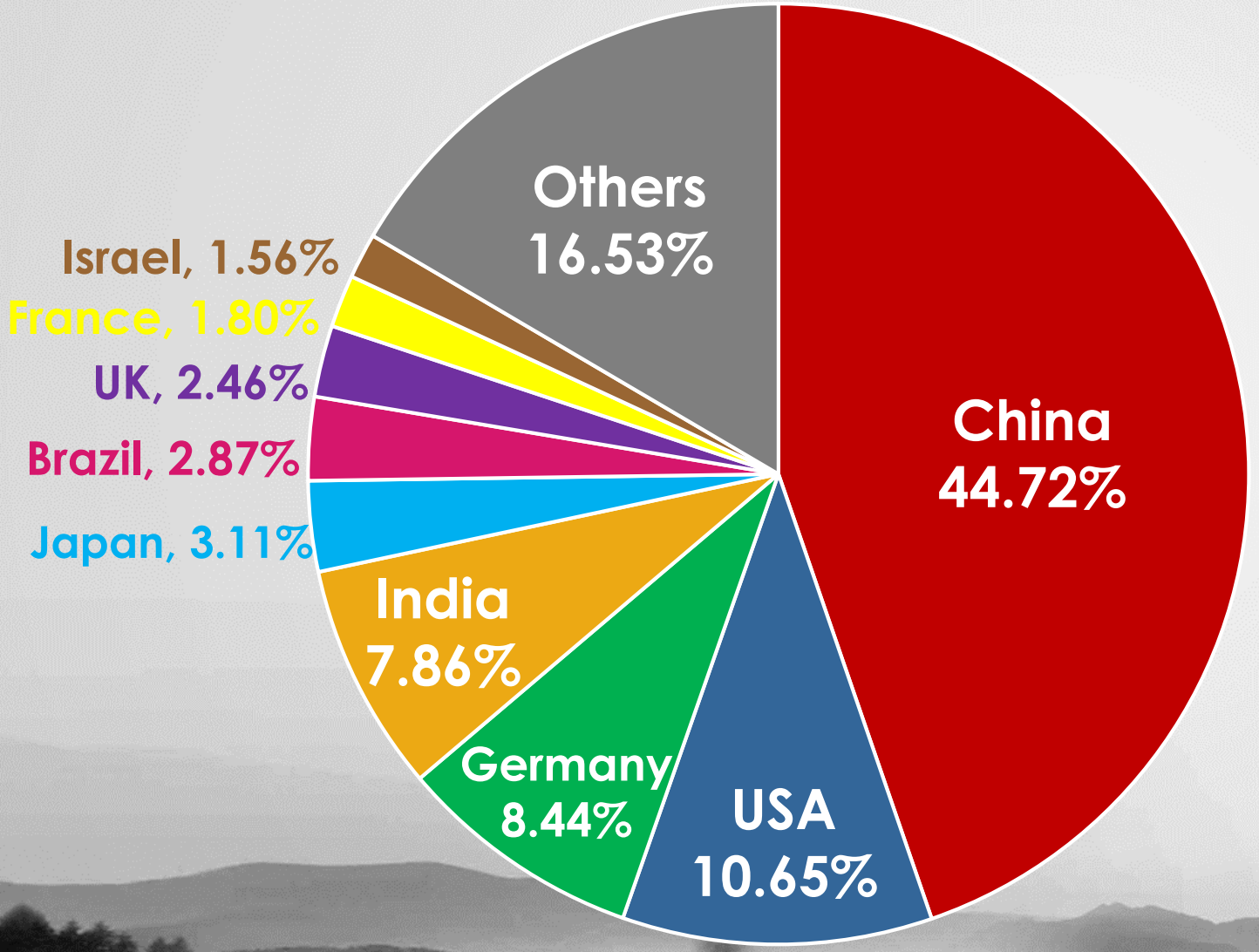
Conference Statistics

Gender of Attendees

Total Registration	Male	Female
1221	902	319



Conference Statistics



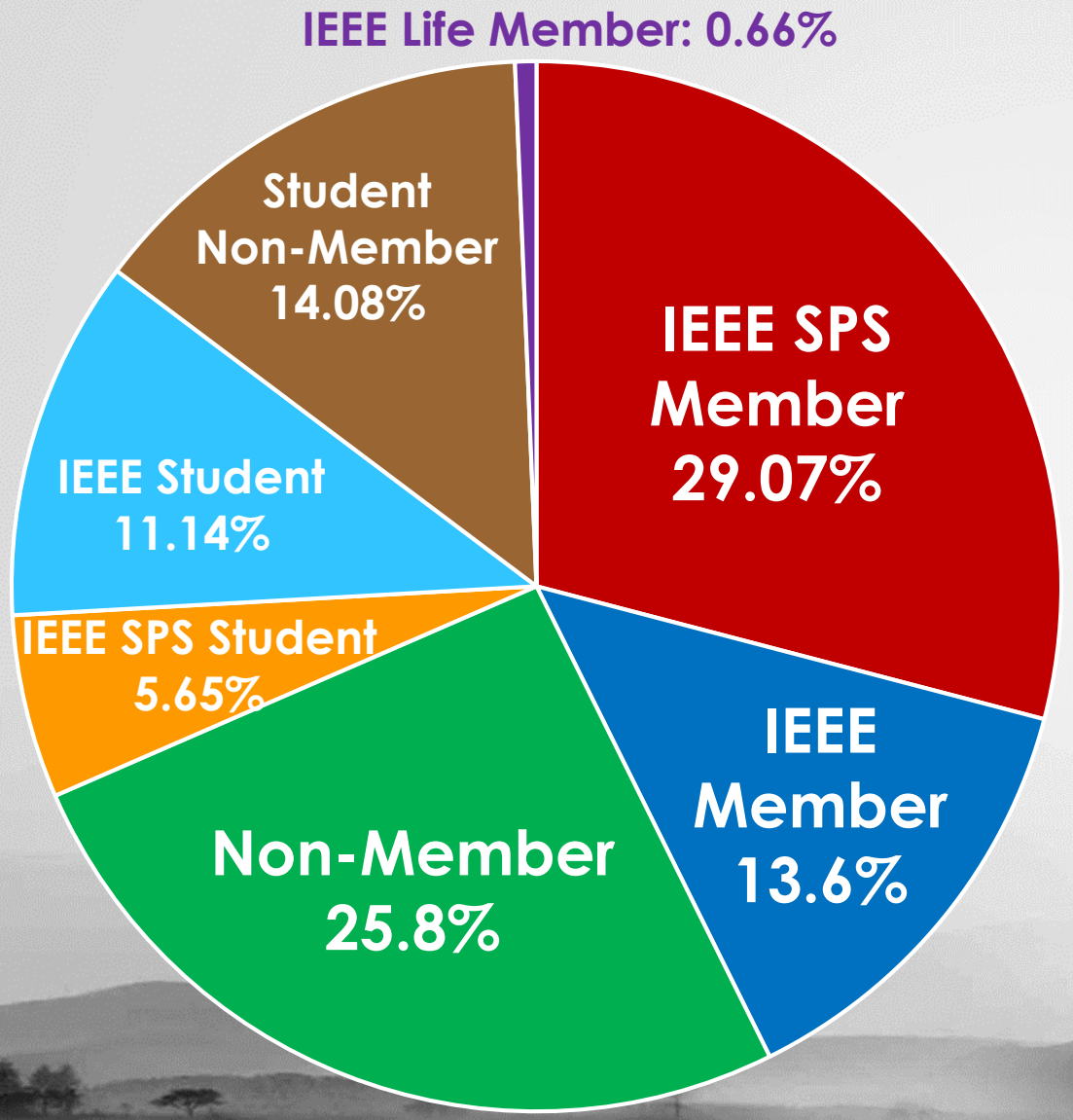
Attendee's Nationality

Country/Region	Attendees
China	546
United States	130
Germany	103
India	96
Japan	38
Brazil	35
United Kingdom (Great Britain)	30
France	22
Israel	19
Others	202

Thank You!

- 1221 Attendees from 59 Nations/Regions, Six Continents
- 188 TPC Members and 358 Reviewers

Conference Statistics



Attendee's Membership

Membership	Attendees
IEEE SPS Member	355
IEEE Member	166
Non-Member	315
IEEE SPS Student Member	69
IEEE Student Member	136
Student Non-Member	172
IEEE Life Member	8

Conference Statistics

Conference Income

Income Item	Number of Registration	Registration Rate (RMB)	Total Income (RMB)
IEEE SPS Member	52	3,085	160,420
IEEE Member	27	3,583	96,741
Non-Member	34	4,180	142,120
Total	**113**		**399,281**

Conference Statistics

Conference Expense

Item Category	Expense (RMB)
Management Services Expense	70106.64
Registration Expense	52800
Promotion Expense	8888.25
Publication Expense	13440.73
Local Arrangement Expense	25000
Remuneration and Award	40000
Total	**210235.62**
Surplus	**47%**

Conference Statistics

- ✓ **257** Submitted Papers (***Record Number***)
- ✓ **162** Accepted Papers (Including **90** invited paper)
- ✓ Acceptance Ratio: **49.66%** (Regular), **80.36%** (Invited)
- ✓ **1221** Registered Attendees

- ✓ **19** Special Sessions
- ✓ **13** Regular Sessions
- ✓ **6** Keynote Speakers
- ✓ **2** Tutorials

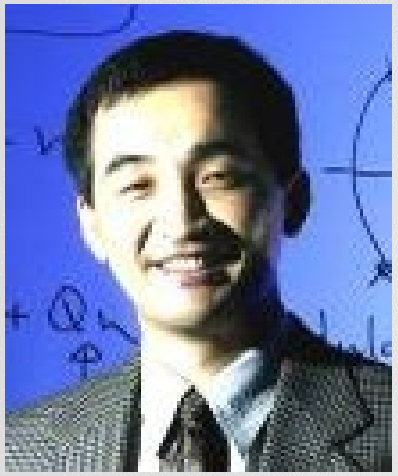
Program Overview

Virtual Platform Open Period:
8-June-2020 to 10-July-2020

Beijing Time Shanghai	CET Time Paris	EST Time New York	Monday, June 8	Tuesday, June 9	Wednesday, June 10	Thursday, June 11
14:00-14:30	8:00-8:30	2:00-2:30		**Regular&Special Sessions R01, R02, R03, R04 SS01, SS02, SS03, SS04, SS05, SS06**	**Regular&Special Sessions R05, R06, R07, R08 SS07, SS08, SS09, SS10, SS11, SS12**	**Regular&Special Sessions R09, R10, R11, R12, R13, SS13, SS14, SS15, SS16, SS17, SS18, SS19**
14:30-15:00	8:30-9:00	2:30-3:00				
15:00-15:30	9:00-9:30	3:00-3:30				
15:30-16:00	9:30-10:00	3:30-4:00				
16:00-16:30	10:00-10:30	4:00-4:30				
16:30-17:00	10:30-11:00	4:30-5:00	**Tutorial 1**			
17:00-17:30	11:00-11:30	5:00-5:30				
17:30-18:00	11:30-12:00	5:30-6:00				
18:00-18:30	12:00-12:30	6:00-6:30				
18:30-19:00	12:30-13:00	6:30-7:00				
19:00-19:30	13:00-13:30	7:00-7:30				
19:30-20:00	13:30-14:00	7:30-8:00				
20:00-20:30	14:00-14:30	8:00-8:30	**Tutorial 2**			
20:30-21:00	14:30-15:00	8:30-9:00		**Opening Ceremony**		
21:00-21:30	15:00-15:30	9:00-9:30		**Plenary 1**	**Plenary 3**	**Plenary 5**
21:30-22:00	15:30-16:00	9:30-10:00				
22:00-22:30	16:00-17:30	10:00-10:30		**Plenary 2**	**Plenary 4**	**Plenary 6**
22:30-23:00	17:30-18:00	10:30-11:00				
23:00-23:30	18:00-18:30	11:00-11:30				**Closing Ceremony**

Thank You!

Tutorial Speakers



Zhi-Quan (Tom) Luo

Marius Pesavento

Minh Trinh Hoang

Mats Viberg

Tutorial 1: Optimization Techniques for Beamforming

Tutorial 2: Four Decades of Array Signal Processing Research: An Optimization Relaxation Technique Perspective

Thank You!

Plenary Speakers

Ami Wiesel
The Hebrew University of Jerusalem

Anna Scaglione
University of Arizona

A. Lee Swindlehurst
University of California, Irvine

Plenary 1: Multitask Regression and Flood Forecasting

Plenary 2: Distributed Signal Processing Algorithms for Big Data Analytics: Principles and Techniques

Plenary 3: Symbol Level Precoding, or How I Learned to Stop Worrying and Love Interference

Thank You!

Plenary Speakers

Georgios Giannakis
University of Minnesota

Lieven De Lathauwer
KU Leuven

Wen Tong
Huawei Technologies Co., Ltd.

Plenary 4: Online Learning and Management for Edge Computing in IoT

Plenary 5: Tensor-Based Sensor Array and Multichannel Signal Processing

Plenary 6: 6G – The Next Technology Horizon

Lessons Learned

- ✓ Divide tutorial and plenary speech into several sessions with multiple Q&A sessions
- ✓ Reserve more time and make more flexible for Q&A in tutorials and hot-topic plenary speeches

Thank You!

Conference Management Staff

Samantha Walter
Conference Coordinator
IEEE Signal Processing Society

Laura LeBlanc
Conference Manager
Conference Catalysts

Thank You!

Organizing Committee

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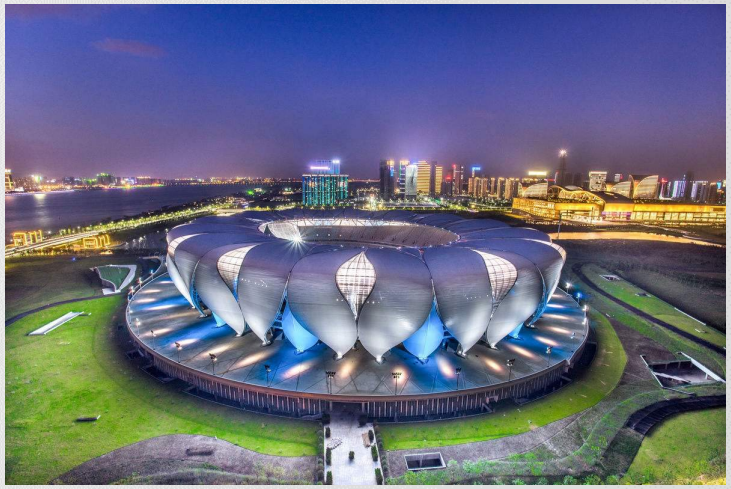
Local Chair

Welcome to Hangzhou

One of the most dynamic and potential cities in China

2016 G20 Hangzhou Summit

Headquarter of Alibaba



2022 Asian Games

Postponed to 2023

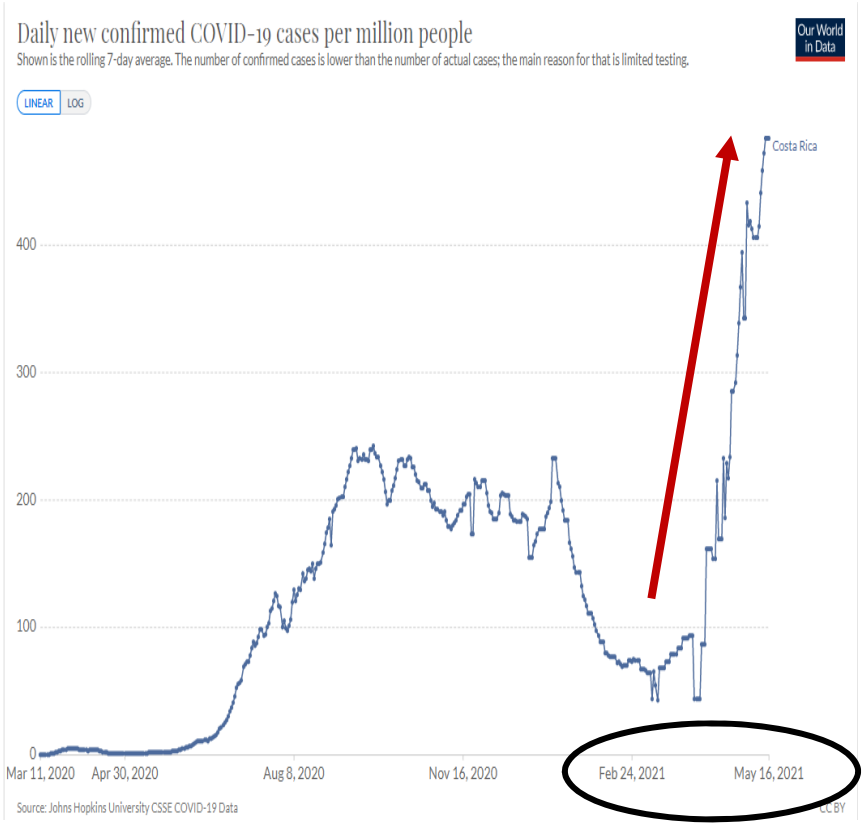
IEEE Signal Processing Society

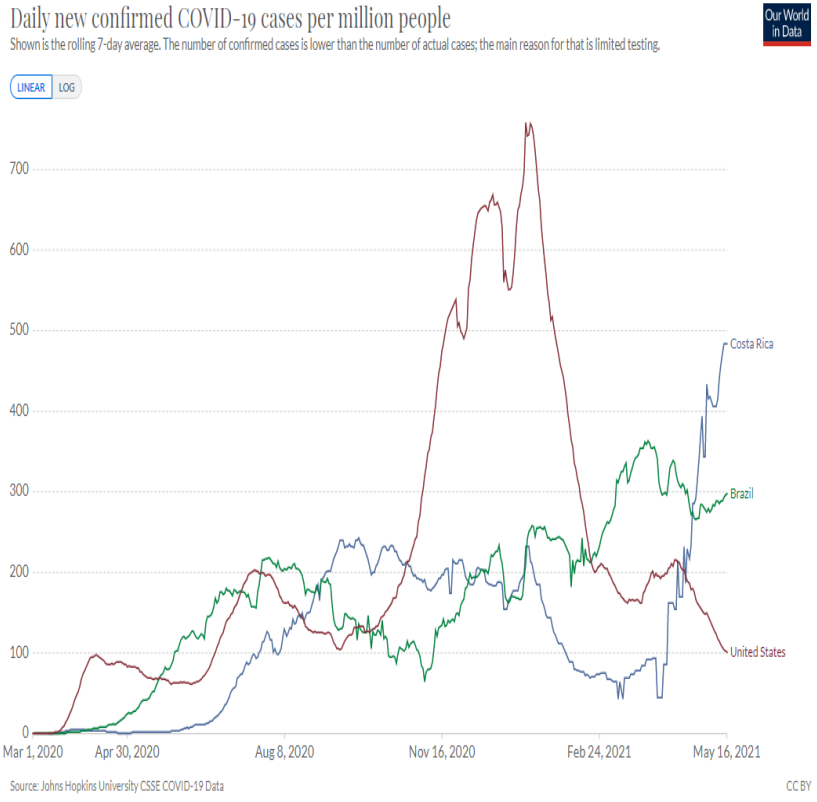

IEEE
IEEE Signal Processing Society
CAMSAP 2023
9th IEEE International Workshop on Computational Advances in Multi-Sensor Adaptive Processing
Costa-Rica, December ?, 2023

CAMSAP 2021 → 2023

- Uncertainty of a physical (even hybrid) event due to the COVID-19 pademic
- Pandemic is growing in Costa Rica (similarly in Central and South America regions)
- CAMSAP does not match with an online format (in-person interactions is a distinctive appeal of CAMSAP..)

COVID-19 evolution in Costa-Rica





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Federal Univ. of Ceará
Brazil

Rémy Boyer
University of Lille
France

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Institut de l'aéronautique et de l'espace
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STUDENT CHAIR

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Centrale Supélec
France

SPECIAL SESSION CHAIR

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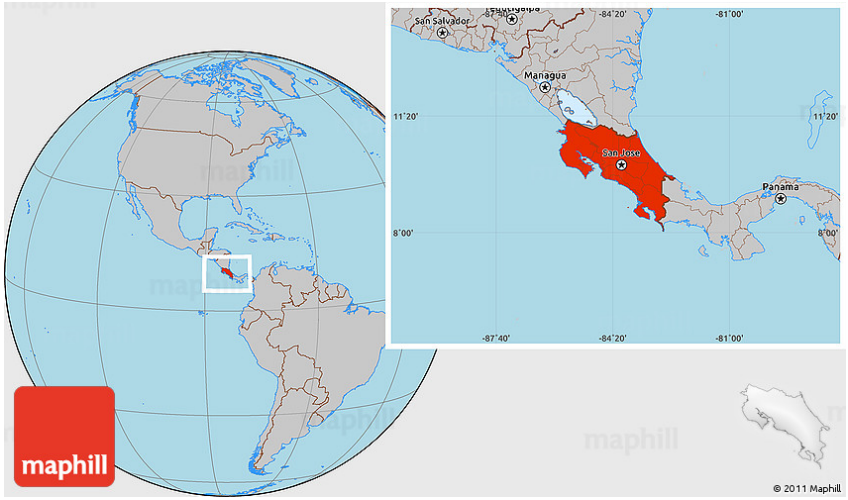
University of California
USA

Location: *Costa Rica*



Capital: San José

Official language: Spanish

51000 sq. km for a population of 5 millions

Time zone : UTC - 6 h

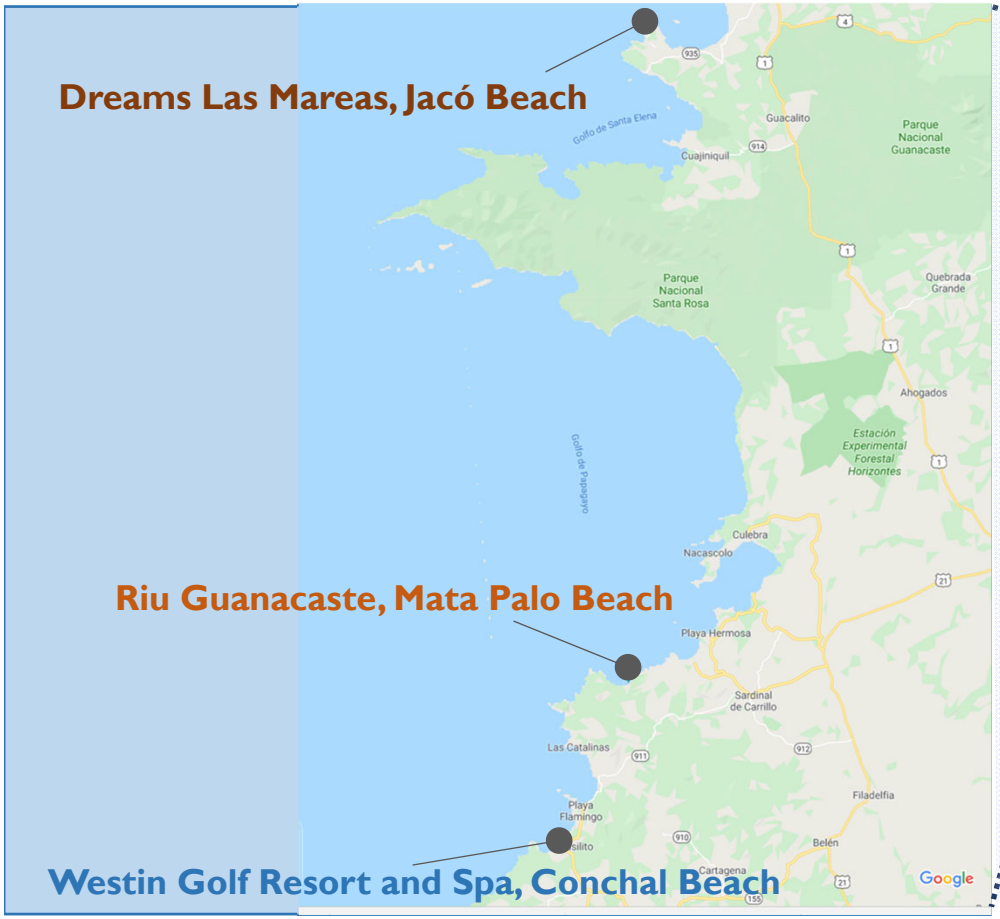
1 $ = 561 CRC (Costa Rican Colon)

Costa Rica is the **most industrialized** country in Central America

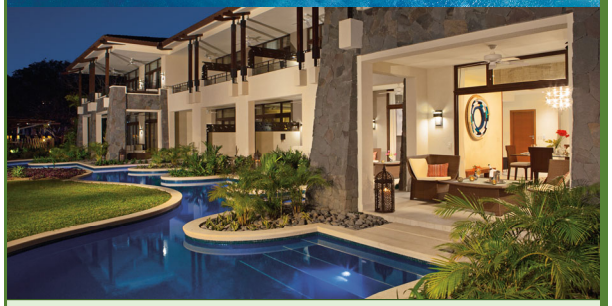
Costa Rica is a **largely safe** country, but petty crime can occur

Possible venues

ALL INCLUSIVE RESORTS



Selected views



Dreams Las Mareas

Westin Golf Resort and Spa

Riu Guanacaste

Costa Rica: airlines

SJO is the primary airport serving San José, the capital of Costa Rica (around 5 million of passagers)

From US

Alaska Airlines : Los Angeles
American Airlines : Charlotte, Dallas/Fort Worth, Miami, NY–JFK
Delta Air Lines : Atlanta, Los Angeles
United Airlines : Houston–Intercontinental, Newark
JetBlue : Fort Lauderdale, New York–JFK, Orlando
Spirit Airlines : Fort Lauderdale, Orlando

From central/south america

Air Panama : Panama City–Albrook
Avianca Costa Rica : Bogotá, Guatemala City, Lima, Managua, Panama
Avianca El Salvador : San Salvador
Avianca Guatemala : Guatemala City
Interjet : Mexico City
Volaris Costa Rica : Cancún, Guatemala City, Managua, Mexico City

From Europe, UK

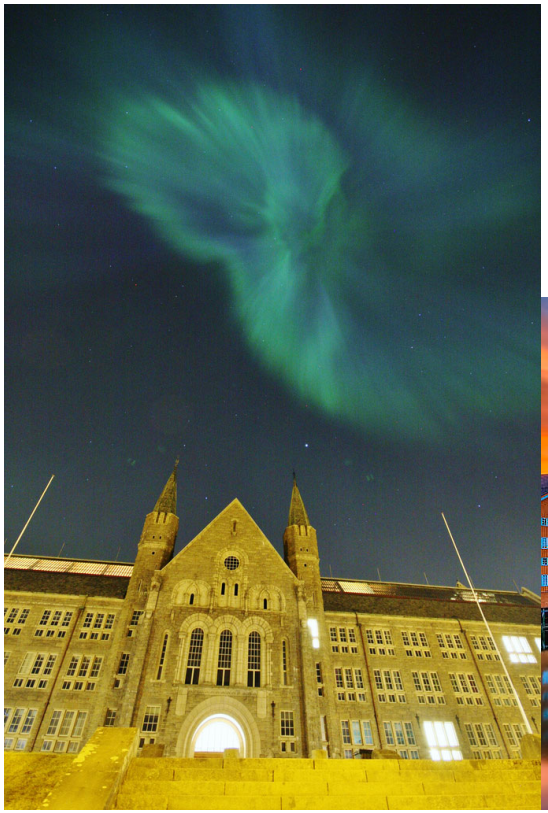
British Airways : London–Gatwick
Air France: Paris-Charles de Gaulle
Edelweiss Air : Zürich
Iberia : Madrid
Lufthansa : Frankfurt

Suggested schedule

December 2022 :	First annoucement and call for papers
March 2023 :	Special session proposals
July 2023 :	Full paper submission
September 2023 :	Notification of acceptance
October 2023 :	Camera-ready paper and tentative program
November 2023 :	Early registration due date

NTNU

Norwegian University of
Science and Technology



IEEE SAM 2022 in Trondheim?

A proposal by Pierluigi Salvo Rossi and Stefan Werner

Organizing Committee

General Chairs

- **Pierluigi Salvo Rossi**
  NTNU, Norway

- **Stefan Werner**
  NTNU, Norway

Technical Chairs

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- Yih-Fang Huang (University Notre Dame, US)

Special-Session Chairs

- Domenico Ciuonzo (University Naples “Federico II”, Italy)
- Elena Simona Lohan (Tampere University, Finland)

Tutorial Chairs

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- Milica Orlandic (NTNU, Norway)

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- Visa Koivunen (Aalto University, Finland)
- Antonio Ortega (University of Southern California, US)
- Athina Petropulu (Rutgers University, US)
- Pramod Varshney (Syracuse University, US)
- TBD
- TBD

Important Dates (Tentative)

- **Conference**: June 06-09, 2022
- **Special Session Proposal**: December 05, 2021
- **Tutorial Proposal**: December 19, 2021
- **Paper Submission**: January 23, 2022
- **Notification of Acceptance**: April 10, 2022
- **Early Registration**: May 15, 2022

Registration Fees (Tentative)

	Early Registration	Late Registration
IEEE SPS Member	600 €	700 €
IEEE Member	650 €	750 €
Non-Member	750 €	850 €
IEEE Student Member	350 €	450 €
Non-IEEE Student	400 €	500 €

Connecting Options

- Trondheim international airport (Værnes,19 km east of Trondheim) connects to
  - 15 domestic destinations
  - 15 international destinations
  - 18 charter destinations

- Direct flights to many airports in Europe:

  Amsterdam (KLM – Sky Team)

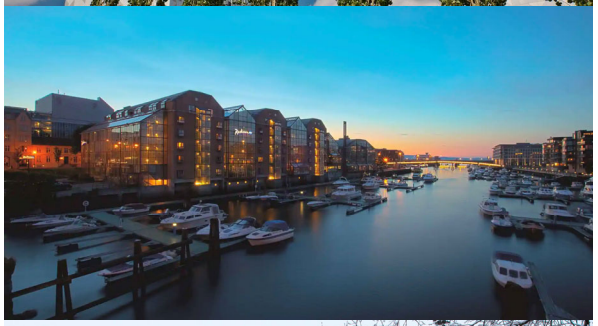
  Copenhagen (SAS – Star Alliance)

  Stockholm, Helsinki, London, Gdansk, Krakow, Malaga, Riga, Split, Alicante

- from Oslo airports several times an hour

Possible Venues

- Clarion Hotel & Congress Trondheim
- Scandic Lerkendal Hotel
- Radisson Blu Royal Garden Hotel
- Britannia Hotel



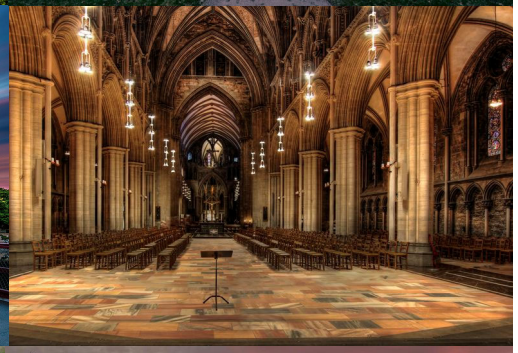
Potential Sponsors

- NTNU
- SINTEF
- Trondheim Municipality
- Disruptive Technologies
- Equinor
- Kongsberg
- Nordic Semiconductor
- Telia
- Telenor

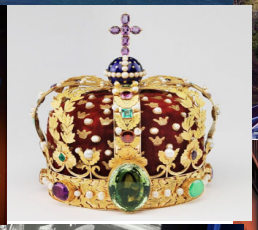
A foot in the Past

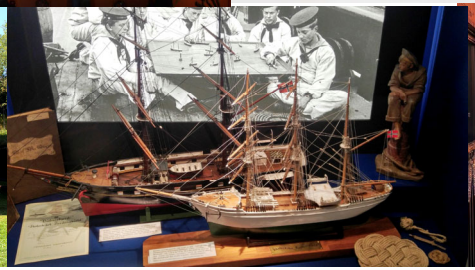






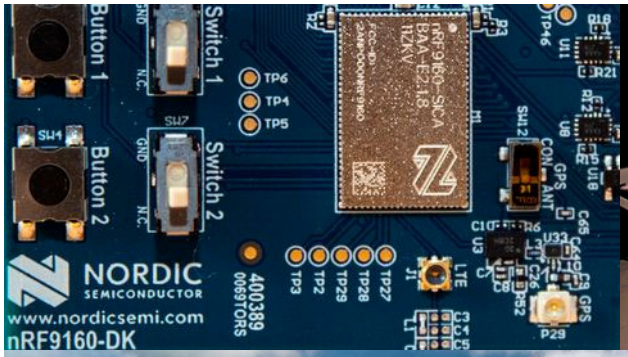


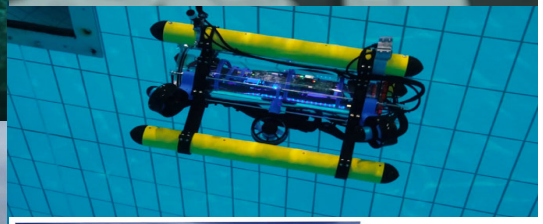




and a foot in the Future

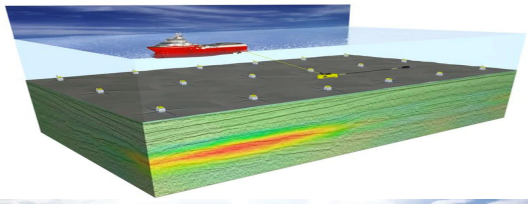
NTNU
Knowledge for a better world

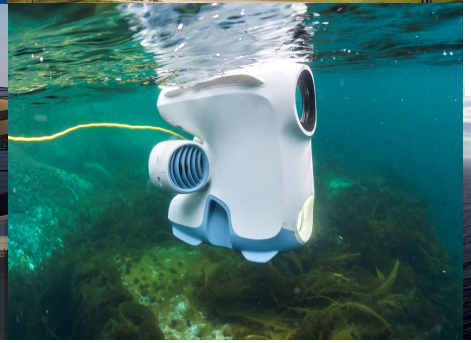


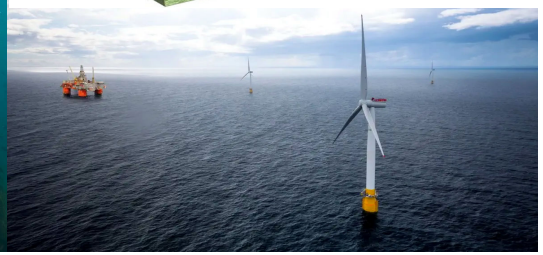


Kahoot!

SINTEF







Excellent Food

- 3 Michelin Restaurants
  - Credo
  - Fagn
  - Speilesalen

- Several opportunities for
  - Local tradition
  - International cuisine

Vibrant Music Scene

- Trondheim Symphony Orchestra

- Ringve

The National Museum for Music and Musical Instruments

- Rockheim

The National Museum for Popular Music

- Live Concerts
  - Local artists
  - International artists

A City in the Nature

4: SAM TC Workshop Proposals

- **SAM 2024**

  ⇒ Preparation of proposals is encouraged. Decision by SAM2022.

⇒ **CAMSAP 2025**

  ⇒ A bit early?

5: SPS Activities

- **Synthetic Aperture TWG (Peter Vouras)**
- **TWG Integrated Sensing and Communication (Tsung-Hui Chang)**
- **Unified EDICS**

SPS Technical Working Groups

(approved by the SPS BoG in Oct 2019)

- Technical Subgroups redefined as Technical Working Groups (TWG).
- TWG resides under a primary TC.
- TWG covers a specific topic within SPS Field of Interest.

TWG Synthetic Aperture

- Approval by IEEE SPS on 15 April 2020
- TWG resides under SAM TC
- TWG Chair: Peter Vouras (NIST)

Overview of Synthetic Aperture Technical Working Group

May 18, 2021

History and Background

- Synthetic Aperture Technical Working Group (SA-TWG) was approved in April 2020. Kickoff meeting on May 19, 2020
- Creation of the SA-TWG was motivated by a desire to bring together researchers working independently in many different applications of synthetic apertures
- Examples include Synthetic Aperture Radar (SAR), Millimeter-Wave Channel Sounding, Medical Imaging, Sonar, Optics, Radio Astronomy
- Meets monthly to review developments relevant to synthetic apertures and to plan activities
- On February 18, 2021, the Radar Splinter Group (RSG) held its first meeting
  - The RSG meets immediately after the regular SA-TWG meetings and is focused exclusively on the radar aspects of synthetic apertures

ICASSP 2021

- Several members of the TWG submitted and will be presenting papers related to synthetic apertures at the ICASSP 2021 conference
- ``*Fundamental Trade-Offs in Noisy Super-Resolution with Synthetic Apertures*,'' Sina Shahsavari, Jacob Millhiser, Piya Pal
- ``*Temporal Exemplar Channels In High-Multipath Environments*,'' Mohamed Kashef, Peter Vouras, Robert Jones, Richard Candell, Kate A. Remley

JSTSP Proposal

- Group is preparing to submit proposal to Journal of Selected Topics in Signal Processing (JSTSP) titled, ``*Recent Advances in Wideband Signal Processing and Delay Estimation for Classical and Quantum Synthetic Apertures*''

- Proposal solicits papers describing new advances in the signal processing aspects of delay estimation for

1. Synthetic aperture systems that have no inherent bandwidth. For example, optical systems that estimate delay or distance with machine learning techniques that determine depth in 2D images

2. Systems that operate over discontinuous regions of spectrum. These systems include quantum apertures that rely on atomic vapors to measure electric fields. Typically, the atoms are tuned to specific frequencies and continuous frequency coverage is not possible

3. Systems that synthesize wide bandwidths from narrowband signals. Examples include synthetic apertures used in channel sounding for wireless communications that rely on a Vector Network Analyzer (VNA)

4. Wideband systems with a large instantaneous signal bandwidth. These synthetic apertures may include SAR operating at millimeter-wave frequencies with signals that have a relatively large bandwidth in absolute terms (several GHz), or radars operating at lower frequencies with signals that occupy a larger fractional bandwidth

Technical Overview Paper

Group has long-term ongoing effort to submit a technical overview paper to the IEEE Transactions on Computational Imaging describing recent advances in computational imaging techniques that rely on synthetic apertures

Theme	Synthetic Aperture Application							
	Radar	Channel Sounding	Optics	Sonar	Seismology	PET	Ultrasound	MRI
Machine Learning								
Inverse Problems								
New Optimization Approaches								
Unconventional Geometries								
Unconventional Frequencies								

Radar Splinter Group

- ***Formed***: January 2021
- ***Meetings held***: 18-Feb-2021, 11-Mar-2021, 8-Apr-2021, 13-May-2021
- ***Led by:*** Dr. Kumar Vijay Mishra, US Army Research Laboratory
- ***Objective***: Facilitate discussions on SA focused on radar, which form a bulk of SA applications. This aids in proportionate efforts devoted to other applications in the main TWG-SA.
- ***Activities***:
  - Current objective is to contribute the radar content to the main SA overview paper of the TWG to be submitted to *IEEE Transactions on Computational Imaging*
  - Generate best readings on radar SA
  - Participate and contribute to the IEEE Journal of Selected Topics in Signal Processing (JSTSP) and Signal Processing Magazine (SPM) special issue proposals on wideband SA
  - A separate proposal for IEEE JSTSP SI on wideband radar is also being actively discussed for next year

香港中文大學(深圳) The Chinese University of Hong Kong, Shenzhen | 理工学院 School of Science and Engineering

IEEE Signal Processing Society

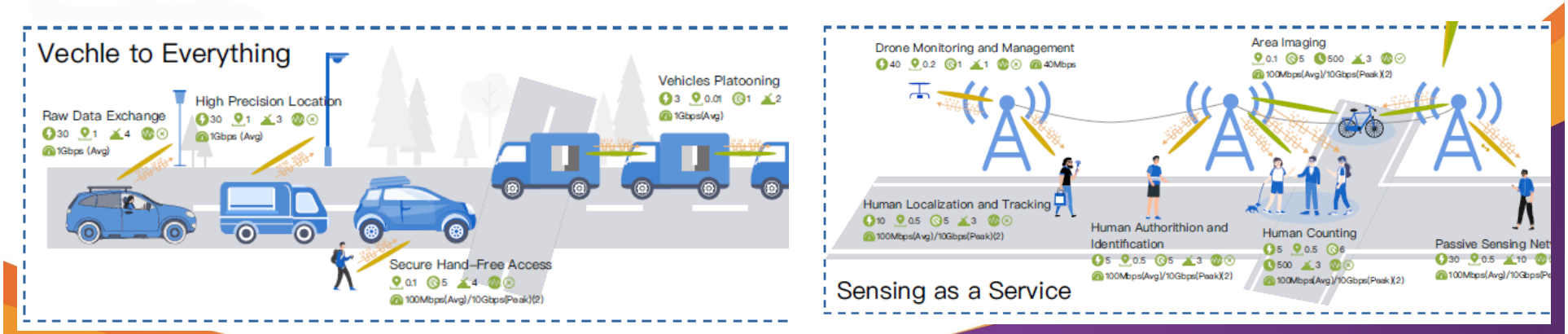
Integrated Sensing and Communication Technical Working Group (ISAC TWG)

Tsung-Hui Chang
Associate Professor
The Chinese University of Hong Kong, Shenzhen
Shenzhen Institute of Big Data
tsunghui.chang@ieee.org

Motivation

- Radar and comms have become more and more similar in hardware architecture, channel model, as well as in signal processing at the mmWave band.

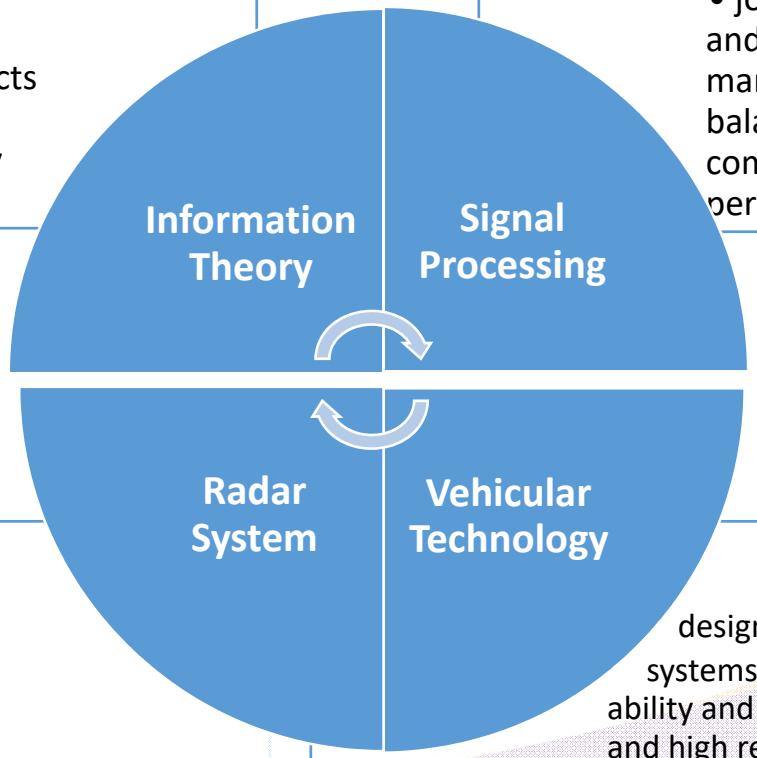
- ISAC refers to the design paradigm and corresponding enabling technologies that combine sensing and communication systems to utilize wireless resources efficiently, realize wide area environment sensing, and even to pursue mutual benefits.



Picture courtesy of Prof Fan Liu at SUSTech

Scope

- The state-of-the-art ISAC research mainly includes, but not limited to the following areas



- reveal the theoretical limits and fundamental tradeoffs from the aspects of information and signal processing theory

- jointly design the waveform and interference management to achieve a balance between good communication and sensing performance

- integrate the communication functionality into the current radar systems to improve spectrum efficiency

design the next generation vehicular systems with enhanced communication ability and sensing range with lower latency and high reliability at lower cost

Related Activites

- Academia
  - special sessions in ICASSP 2020/2021, GLOBECOM 2020, ICC 2020, WCNC 2021 and special issues in JSAC and JSTSP
- Industry
  - Huawei identifies ISAC as one of the three major scenarios in their vision of 5.5G
  - Nokia Bell proposes a unified mm-wave system for combined communication and sensing
  - Docomo identifies sensing capabilities as the key requirements for 6G wireless technology
- Funding agency
  - Horizon 2020 program of EU, DARPA of USA , NSFC/MOST of China
- Standardization
  - WLAN sensing (SENS) Task Group for IEEE 802.11bf

Related Activites

IEEE ComSoc ISAC SIG

https://wtc.committees.comsoc.org/sig/

IEEE WTC Special Interest Group (SIG) on Integrated Sensing and Communication (ISAC)

- **Name of SIG:**

  Integrated Sensing and Communication (ISAC)

- **Organizers**:

  Chair: Jie Xu, The Chinese University of Hong Kong, Shenzhen, China (Email: xujie@cuhk.edu.cn)
  Vice-Chair: Tony Xiao Han, Huawei Technologies Co., Ltd., China (Email: tony.hanxiao@huawei.com)
  Vice-Chair: Christos Masouros, University College London, UK (Email: c.masouros@ucl.ac.uk)

- **Scope and Objectives**:

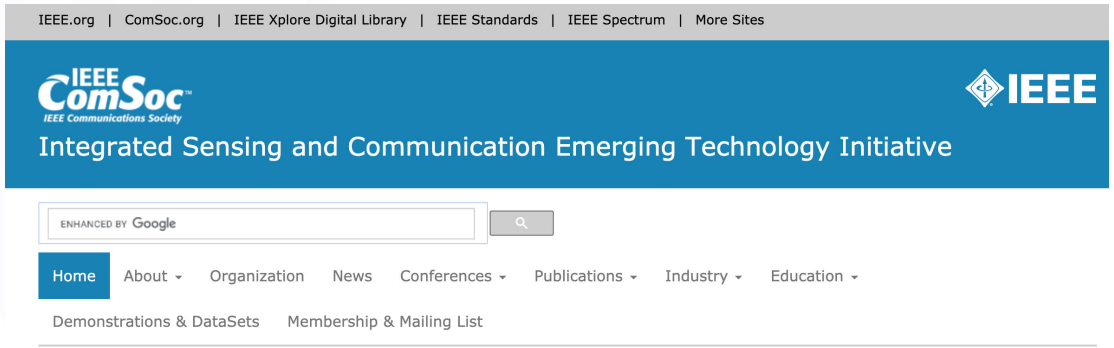
  Recently, the integrated sensing and communications (ISAC), in which the sensing and communications share the same frequency band and hardware, has emerged as a key technology in future wireless systems (e.g., 6G and WiFi 7) to enable many important applications such as autonomous vehicles and extended reality (XR). Despite these early research efforts on ISAC, many open problems about ISAC still remain open, such as the unified theoretical frameworks, the fundamental performance limits, the ISAC waveform design, and the ISAC signal processing algorithms. In this SIG group, we provide a platform to bring together academic and industrial researchers to share their ideas and discuss the major technical challenges, recent breakthroughs, and new applications related to ISAC. Topics of interest of this SIG include, but are not limited to:

  1. Fundamental information theoretical limits for ISAC
  2. Network architectures and communication protocols for ISAC
  3. Waveform/sequence/coding/modulation/beamforming design for ISAC
  4. MIMO, massive MIMO, and intelligent reflecting surface (IRS) for ISAC
  5. Millimeter wave and THz ISAC
  6. ISAC in unmanned aerial vehicle (UAV) and vehicular-to-everything (V2X) networks
  7. Machine learning/AI enhanced ISAC
  8. Channel measurement and modelling for ISAC
  9. System-level simulation, prototyping, and field-tests for ISAC
  10. Standardization of ISAC

Related Activites

IEEE ComSoc ISAC ETI

https://isac.committees.comsoc.org/



ISAC
EMERGING TECHNOLOGY INITIATIVE

Welcome to the Integrated Sensing and Communication Emerging Technology Initiative

Organization

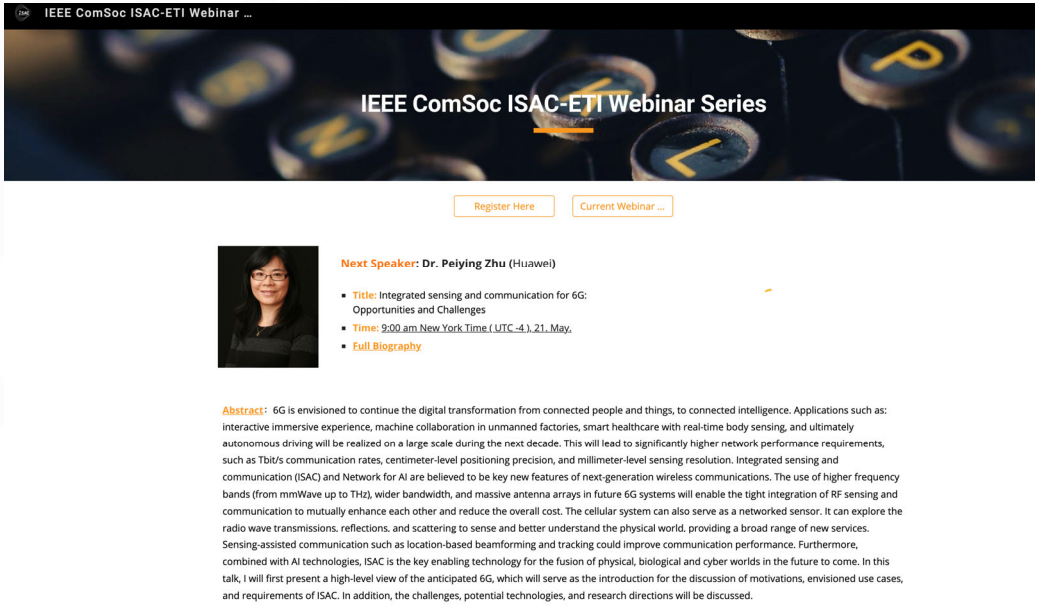
Founding Leadership Team

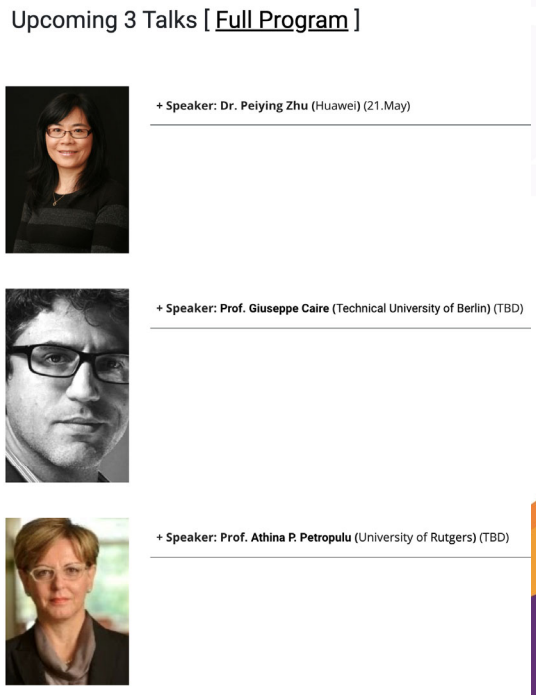
Academic Chair	Fan Liu	Southern University of Science and Technology
Industrial Chair	Tony Xiao Han	Huawei
Vice-Chair US Region	Athina Petropulu	Rutgers University
Vice-Chair UK&Ireland Region	Christos Masouros	University College London
Vice-Chair Asia Region	Jie Xu	The Chinese University of Hong Kong, Shenzhen
Vice-Chair EU Region	Taneli Riihonen	Tampere University
Vice-Chair Industry	Jianmin Lu	Huawei
Vice-Chair Industry	Carlos Cordeiro	Intel
Secretary	Yuanhao Cui	Beijing University of Posts and Telecommunications

Related Activites

IEEE ComSoc ISAC-ETI Webinar Series

https://sites.google.com/view/isac-webinar-series/home





Target tasks

1. Special tracks, workshops, and the international conference

   ICASSP, SPAWC, SSP, SAM, GLOBECOM, ICC and INFOCOM

2. Special issues in top-tier IEEE journals

   SPM, JSTSP, JOJSP and TSIPN in the SPS, and top journals in ComSoc/AESS/VTS/ITSS

3. Tutorials, invited talks, and industry panels
4. Introduction of new EDICS
5. Standardization

   IEEE 802.11 standards for ISAC application in vehicle network, IEEE 802.11 bf for WLAN sensing, as well as 3GPP NR Release 18 and beyond

6. Datasets, competitions, and reproducible research

   Encourage the ISAC-related datasets to provide a baseline for novel applications

7. Research Library and Best Readings

Join the TWG

- Let me know by email (tsunghui.chang@ieee.org) and indicate what you would like to contribute about the above target tasks; good if you are particularly interested in **leading** some task
- Due to limited number of membership, we may only accept few to join if there are many colleagues interested.
- Comments and suggestions are welcome!

Thank you

Unified EDICS for SAM TC

SAM-APPL	Applications of sensor & array multichannel processing
SAM-BEAM	Beamforming
SAM-CALB	Array calibration
SAM-CSSM	Compressed sensing and sparse modeling
SAM-DOAE	Direction of arrival estimation
SAM-GSSP	Geophysical and seismic signal processing
SAM-IMGA	Inverse methods and imaging with array data
SAM-LRNM	Learning models and methods for multi-sensor systems
SAM-MCHI	Multichannel processing, identification, and modelling
SAM-MAPR	Microphone array processing
SAM-NWAV	Non-wave based array processing
SAM-PERF	Performance analysis and bounds
SAM-SDET	Source detection and separation
SAM-SENS	Multi-sensor remote sensing
SAM-STAP	Space-time adaptive methods
SAM-TNSR	Tensor-based signal processing for multi-sensor systems
SAM-MUCN	Multi-user and cooperative networks
SAM-CAMS	Computational advances for multi-sensor systems

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Unified EDICS for SAM TC

RAS-DTCL	Target detection, classification, localization
RAS-LCLZ	Source localization
RAS-MIMO	MIMO Radar and waveform design
RAS-SARI	Synthetic aperture radar/sonar and imaging
RAS-SONR	Sonar and underwater signal processing
RAS-TRCK	Target tracking
BIO-SENS	Sensor arrays for medical signal and image processing
SPC-MIMO	Multiple-input multiple-output communication systems
SPC-MMIMO	Massive MIMO communication systems

Unified EDICS List including update procedure:

https://signalprocessingsociety.org/publications-resources/unified-edics

Agenda

- 1. Welcome
- 2. Report from Chair (Part 1)

  Membership Update

  DIS and DL, and SPS Awards
- 3. Workshop Reports

  SAM 2020, Hangzhou, (Zhiguo Shi, Martin Haardt)

  CAMSAP 2021/2023, Costa Rica, postponed (Martin Haardt, André L.F. de Almeida, Rémy Boyer)

  SAM 2022, Trondheim (Pierluigi Salvo Rossi, Stefan Werner)
- 4. Proposals requested for

  SAM 2024

  CAMSAP 2025 (?)
- 5. SPS Activities

  Synthetic Aperture TWG (Peter Vouras)

  TWG Integrated Sensing and Communication (Tsung-Hui Chang)

  Unified EDICS
- 6. Report from Chair (Part 2)

  ICASSP 2021 (SAM TC Area)

  TC status/review
- 7. Subcommittee Reports
- 8. Discussion about Initiating Possible Online Lecture Series
- 9. Miscellaneous (Job Posting, etc.)

IEEE Signal Processing Society

6: History of ICASSP SAM Area Submissions

- Annual figures for SAM submissions as a fraction of total ICASSP submissions:

⇒ **2021: 145 / 3610 = 4.0 %**	**Toronto, Canada**
⇒ 2020: 189 / 3951 = 4.8 %	Barcelona, Spain
⇒ 2019: 140 / 3510 = 4.0 %	Brighton, UK
⇒ 2018: 147 / 2738 = 5.4 %	Calgary, Canada
⇒ 2017: 170 / 2697 = 6.3 %	New Orleans, USA
⇒ 2016: 200 / 2682 = 7.5 %	Shanghai, China
⇒ 2015: 212 / 2322 = 9.1 %	Brisbane, Australia
⇒ 2014: 222 / 3544 = 6.3 %	Florence, Italy
⇒ 2013: 216 / 3362 = 6.4 %	Vancouver, Canada
⇒ 2012: 171 / 2615 = 6.5 %	Kyoto, Japan

Virtual ICASSP 2021 Toronto versus previous two years:

With 3610 (3951, 3510) submissions, 1734 (1881, 1725) accepted papers, at an acceptance rate of 48.0% (47.6%, 49.1%), and ? (67, 41) presentations of journal articles recently published in Society's Transactions and Letters.

ICASSP 2021 SAM Area

- 145 papers submitted
- 72 accepted, which means an acceptance rate of 49.7%.
- Additionally there are 4 Signal Processing Letters to be presented in SAM sessions (originally 6 but 2 withdrawn).
- 13 poster sessions with 6 papers each (2 papers withdrawn).

1144: Direction of Arrival
1145: Beamforming
1146: Sparse Array Design and Processing
1147: MIMO Radar Array Processing
1148: Detection and Classification
1149: Tracking and Localization
1150: MIMO and Massive MIMO Array Processing
1151: Microphone Array Signal Processing
1152: Detection and Estimation I
1153: Direction of Arrival Estimation II
1154: Array Calibration and Performance Analysis
1155: Multi-Channel Data Fusion and Processing
1295: Detection and Estimation II

SAM TC Status/Review

Comment on the strengths of the TC:

Overall, the SAM TC is in a healthy state.

We have been receiving a good number of submissions at ICASSP and our two flagship workshops, and we have also built a pool of quality reviewers (about 250) to handle each year's ICASSP submissions promptly and effectively. We have had a strong history of successful nominations for major SPS individual and paper awards, and our TC members are very actively involved in SPS business. One particular example is our current IEEE SPS President-Elect Prof. Athina P. Petropulu who is a past member of our TC; four members of the organizing committee of ICASSP2021 including one general co-chair are current/former members of the SAM TC; we have also successfully organized the first IEEE Five-Minute Video Clip Contest (5-MICC) "Let There Be a Beam" at ICASSP2020. In terms of membership diversity and gender equality, SAM-TC now has a number of female (9 out of 41 or 22%, which doubles the 11% of current female SPS membership percentage) and Region 10 (9 out of 41) members, presumably thanks in part to its "two-step" voting process; we have also elected our second female vice-chair Prof. Maria Sabrina Greco, who will be the second female SAM TC Chair in two years' time.

Comment on the weaknesses of the TC:

While SAM TC is proud of its inclusion along gender and regional lines, it has not been as successful with recruiting members from industry and government labs. In terms of student involvement, SAM-TC would like to increase the pool of student affiliate members (currently 26 out of the 141 affiliate members) and increase their participation in the TC activities, which will be crucial to the continued success of the SAM TC.

Comment on the opportunities for the TC:

In the era of artificial intelligence, multi-sensor based systems and techniques are ubiquitous and will play an even greater role in the future. This is an exciting time for the SAM TC to promote its activities, make a more extensive and deeper impact in the real world and further enhance its standing in the society as a technical group.

Comment on the threats to the TC:

The opportunity provided to us in this AI era is also a threat and challenge as the ubiquitous employment of multi-sensor based systems and techniques will also mean that this could dilute the focus of our TC and there will be increasing overlaps between the SAM TC and other committees and societies.

Describe how you plan to address Opportunities and Threats:

This is a long term issue and we will have continuous discussions in our coming TC meetings about the direction/focus of the TC addressing both the opportunities and threats. For the two weaknesses, the key is communication, and we will have more regular email communications /newsletters with all membership categories, and promote our TC activities to a wider audience in various events. In particular, we will discuss the possibility of creating a lecture series focused on the SAM TC area in the coming TC meeting, with both advanced topics and tutorial-style presentations; we will also encourage our members and their organizations to promote their job opportunities related to SAM using our email lists.

7: Subcommittee 2021 Reports

- **Technical Directions** (Maria Sabrina Greco, Jun Liu, Peter Vouras)
- **Awards** (Antonio Napolitano, Xiangrong Wang, Lei Huang, Walter Kellermann)
- **Nominations and Elections** (Xiao-Ping (Steven) Zhang, Aboulnasr Hassanien, Gang Li, Vincenzo Matta)
- **Workshops** (André L. F. de Almeida, Sundeep Chepuri, Bin Liao)
- **Webmaster** (Alexander Bertrand, Waheed U. Bajwa)
- **Newsletter** (Hongbin Li, Yao Xie, Nuria González Prelcic)
- **Membership** (Yongwei Huang, Elias Aboutanios)
- **Industry/Government** (Pascal Chevalier, Hassan Mansour, Yujie Gu)
- **Education** (Adel Belouchrani, Henry Arguello, Xiao Fu)
- **EDICS** (Wei Liu, Maria Sabrina Greco, Usman Khan)
- **Student** (Ali Moussa)

(Underline means chair)

7: Subcommittee 2021 Reports

Area Chairs

Applications of SAM processing	Yuejie Chi
Beamforming and space-time processing	Gonzalo Seco-Granados
Detection, estimation, and source separation	Karim Abed-Meraim
Multi-antenna and multi-channel comm.	Piya Pal
Radar array processing	Fauzia Ahmad
Sensor array processing	Rémy Boyer
Sensor networks	Ashish Pandharipande

Four Regional Representatives

1. USA (1-6)	Gonzalo Mateos Buckstein
2. Canada/Latin America (7/9)	Felix Antreich
3. Europe/Mid East/Africa (8)	Angela Alexiou
4. Asia/Pacific (10)	Qian He

https://drive.google.com/file/d/14MsPdL34IWBEmGNUVLwFTlAw8wwSvcGw/view?usp=sharing

Archiving of SAM Workshop Websites

- Responsible: Webmaster Subcommittee
- Past workshops are often housed on University servers, and eventually are removed.
- Lost TC memory (and memories).
- IEEE is willing to house them, link from web page.
- Presently the following workshops have been archived:
  - SAM 2018
  - CAMSAP 2017
  - SAM 2016
  - CAMSAP 2015
  - SAM 2014
  - CAMSAP 2013
  - CAMSAP 2011
  - SAM 2010
  - CAMSAP 2009
  - SAM 2008
  - CAMSAP 2007
  - CAMSAP 2005
  - SAM 2002
- To Do: CAMSAP 2019, SAM2020
- Missing: SAM 2012, SAM 2006, SAM 2004.

8: Discussion about Initiating Possible Online Lecture Series

- Yes or no?
- Tutorial and research and any other nature such as demonstration
- Who gives the talk?
- How often?
- Organizer?

8: Miscellaneous (Job Posting, etc.)

Job posting: we could encourage our members and their organizations to promote their job opportunities related to SAM using our email lists, but it turned out that SPS does not allow using the email list in this way. Any other ideas?

Newsletter: The Speech and Language Processing TC newsletter

https://signalprocessingsociety.org/community-involvement/speech-and-language-processing/speech-and-language-technical-committee

Main Task List 2021-2022 (1/2)

- **May 31, 2021:**

  Nominations for Distinguished Lecturers and DIS (Responsibility: TC chair, Awards subcommittee)

- **September 1, 2021:**

  Nominations for Paper Awards: BPA, YABPA, MBPA, LBPA, OPA, SIPA (Responsibility: TC Vice-Chair, Awards subcommittee)

  Nominations for Society Award, Technical Achievement Award (Responsibility: TC Chair, Awards subcommittee)

- **November 15, 2021:**

  Membership election completed (Responsibility: Elections and nominations subcommittee)

- **November – December 2020:**

  ICASSP 2022 Paper Reviews and Decisions (Responsibility: TC-chair)

  Paper acceptance communicated to authors January xx, 2022.

Main Task List 2021-2022 (2/2)

- **December/January 2022:**
  Checking the progress of SAM2022
- **January 31, 2022:**
  Update of IEEE SAM TC website: Membership 2022
  Assignment of new members to subcommittees
  Make sure that mailing lists reflect updated membership
- **January - April 2022:**
  Preparation of proposals for SAM 2024
- **June 2022:**
  SAM2022

Thank You!