



TC ANNUAL REPORTING FORM

IMS Technical Committee

TC-22 - Intelligent Measurement Systems

Reporting period

| Starting date (dd/mm/yy) | Ending date (dd/mm/yy) | Date of submission (dd/mm/yy) |
|--------------------------|------------------------|-------------------------------|
| 12/09/20 | 10/10/21 | 11/10/21 |

Website

<https://ieee-ims.org/technical-committee/tc-22>

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 |
|------------|-------------|-------------|-----------------------------------------|-------------------|------------------|--------------------------|------------------|
| Angelo | | Genovese | Università degli Studi di Milano, Italy | 92187688 | +39 02 503 16249 | angelo.genovese@unimi.it | |
| Mel | | Siegel | Carnegie Mellon University, USA | | +1 412 268 8742 | mws@cmu.edu | |

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 |
|------------|-------------|-------------|----------------------|-------------------|-------|----------------|------------------|
|------------|-------------|-------------|----------------------|-------------------|-------|----------------|------------------|

* Please add as many rows as needed

TC Membership list^(*)

| First Name | Second Name | Family Name | Affiliation /Address | Membership number | Phone | e-mail address | TC assignments (joining year) |
|-------------|-------------|-------------|--------------------------------------------|-------------------|------------------|-----------------------------|-------------------------------|
| Angelo | | Genovese | Università degli Studi di Milano, Italy | 92187688 | +39 02 503 16249 | angelo.genovese@unimi.it | |
| Mel | | Siegel | Carnegie Mellon University, USA | | +1 412 268 8742 | mws@cmu.edu | |
| Mario | | Diván | National University of La Pampa, Argentina | | | mjdivan@eco.unlpam.edu.ar | |
| Vincenzo | | Piuri | Università degli Studi di Milano, Italy | | +39 02 503 16244 | vincenzo.piuri@unimi.it | |
| Fabio | | Scotti | Università degli Studi di Milano, Italy | | +39 02 503 16229 | fabio.scotti@unimi.it | |
| Zsolt János | | Viharos | Hungarian Academy of Sciences, Hungary | | +36 1 279 6 195 | viharos.zsolt@sztaki.mta.hu | |

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

Scope:

Fostering development and use of artificial intelligence, computational intelligence, and soft computing in measurement systems and related applications.

Goals:

- Develop, promote, and support artificial intelligence and soft computing in instrumentation and measurement systems.
- Develop, promote, and support the integration of artificial intelligence and soft-computing technologies in advanced instrumentation and measurement procedures and systems.
- Develop, promote, and support standards in the field of artificial intelligence and soft-computing technologies for intelligent instrumentation and measurement applications.
- Disseminate information and knowledge about artificial intelligence and soft-computing technologies for instrumentation and measurement applications and attract a wider audience to their benefits.
- Maintain liaisons with other committees, groups, societies, and organizations working on artificial intelligence and soft-computing technologies and in the applications fields.

* Please add as many rows as needed

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) |
| 03/03/21 | Online | | Angelo Genovese | | | |

Minutes of the yearly meeting (separate file)¹:

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 |
| 2021 IEEE International Conference on Computational Intelligence and Virtual Environments for Measurement Systems and Applications (CIVEMSA 2021) | 18/06/21 | 19/06/21 | 18/06/21 | | | Submission of two papers |

Involvement in standard development^(*)

| Standard | Working Group | Revision | Activity in the reporting period, including dates | Notes, attendance |
|----------|---------------|----------|---------------------------------------------------|-------------------|
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Participation in the development of Society Educational Programs^(*)

| Program name | Involvement of chapters and sections | Activity in the reporting period, including dates | Notes, attendance |
|--------------|-----------------------------------------|---------------------------------------------------|-------------------|
|--------------|-----------------------------------------|---------------------------------------------------|-------------------|

¹ Yes/No, date of the yearly meeting;

² For example, Involvement in reviewing papers (and indicate approximate number of paper reviews for the listed event)

* Please add as many rows as needed

Other Activities (tutorials, teaching, career, cooperation, publications, joint activity with chapters or sections) (*)

| Type of activity | Starting date (dd/mm/yy) | Ending date (dd/mm/yy) | Activity in the reporting period | Notes, attendance |
|--------------------|--------------------------|------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|
| Teaching | | | Dr. Angelo Genovese, Ph.D. course: "Deep Learning for Signal and Image Processing", Università degli Studi di Milano, Italy, November-December 2020 | |
| Teaching | | | Prof. Fabio Scotti, Course: "Intelligent Systems for Industry, Supply Chain, and Environment", A. Y. 2020/2021 (March-June 2021) | |
| Thesis supervision | | | C. Governale, "Analisi e confronto di sistemi operativi real-time", B.Sc. thesis, 2021 | |
| Thesis supervision | | | M. Pirazzini, "Software systems for efficiently managing an integrated industrial productive process", M.Sc. thesis, 2020 | |
| Thesis supervision | | | L. Mattarucchi, "Computer science technologies for smart cities", B.Sc. thesis, 2020 | |
| Thesis supervision | | | I. Fumagalli, "Development of a conversational interface in a business intelligence software", 2020 | |
| Thesis supervision | | | M. Tedoldi, "Security in virtual environments", 2020 | |
| Thesis supervision | | | G. Galliani, "Cloud computing: resource allocation algorithms", 2020 | |
| Collaboration | | | Collaboration with STMicroelectronics, Catania, Italy (September 2020 – present) | |
| Collaboration | | | Collaboration with the Visual Information Processing and Protection Group, Università degli Studi di Siena, Italy (June 2019 – present) | |
| Publication | | | M. Abukmeil, S. Ferrari, A. Genovese, V. Piuri, and F. Scotti, "A survey of unsupervised generative models for exploratory data analysis and representation learning", in ACM Computing Surveys, vol. 54, no. 5, June, 2021, pp. 1-40. | |
| Publication | | | R. Donida Labati, A. Genovese, V. Piuri, F. Scotti, and S. Vishwakarma, "I-SOCIAL-DB: A labeled database of images collected from websites and social media for iris recognition", in Image and Vision Computing, vol. 105, no. 104058, January, 2021, pp. 1-9. | |
| Publication | | | D. Gümüşbaş, T. Yıldırım, A. Genovese, and F. Scotti, "A comprehensive survey of databases and Deep Learning methods for cybersecurity and intrusion detection systems", in IEEE Systems Journal, vol. 15, no. 2, June, 2021, pp. 1717-1731. | |
| Publication | | | M. Barni, R. Donida Labati, A. Genovese, V. Piuri, and F. Scotti, "Iris deidentification with high visual realism for privacy protection on websites and social networks", in IEEE Access, vol. 9, 2021, pp. 131995-132010. | |

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| Publication | F. Rundo, A. Genovese, R. Leotta and F. Scotti, V. Piuri, and S. Battiato, "Advanced 3D deep non-local embedded system for self-augmented X-ray-based COVID-19 assessment", in Proc. of the 2021 IEEE/CVF Int. Conf. on Computer Vision Workshop (ICCVW 2021), October 11-17, 2021, pp. 1-10 |
| Publication | F. Rundo, R. Leotta, V. Piuri, A. Genovese, F. Scotti, and S. Battiato, "Intelligent road surface deep embedded classifier for an efficient physio-based car driver assistance", in Proc. of the 1st IEEE Int. Conf. on Autonomous Systems (ICAS 2021), Montreal, Canada, August 11-13, 2021, pp. 1-5. ISBN: 978-1-7281-7289-7. |
| Publication | M. Abukmeil, A. Genovese, V. Piuri, F. Rundo, and F. Scotti, "Towards explainable semantic segmentation for autonomous driving systems by multi-scale variational attention", in Proc. of the 1st IEEE Int. Conf. on Autonomous Systems (ICAS 2021), Montreal, Canada, August 11-13, 2021, pp. 1-5. ISBN: 978-1-7281-7289-7. |
| Publication | A. Genovese, M. S. Hosseini, V. Piuri, K. N. Plataniotis, and F. Scotti, "Histopathological transfer learning for Acute Lymphoblastic Leukemia detection", in Proc. of the 2021 IEEE Int. Conf. on Computational Intelligence and Virtual Environments for Measurement Systems and Applications (CIVEMSA 2021), June 18-20, 2021, pp. 1-6. ISBN: 978-1-6654-1249-0. |
| Publication | A. Genovese, M. S. Hosseini, V. Piuri, K. N. Plataniotis, and F. Scotti, "Acute Lymphoblastic Leukemia detection based on adaptive unsharpening and Deep Learning", in Proc. of the 2021 IEEE Int. Conf. on Acoustics, Speech, and Signal Processing (ICASSP 2021), Toronto, ON, Canada, June 6-11, 2021, pp. 1205-1209. ISBN: 978-1-7281-7605-5. |
| Publication | F. Rundo, R. Leotta, F. Trenta and G. Bellitto, F. Proietto Salanitri, V. Piuri, A. Genovese and R. Donida Labati, F. Scotti and C. Spampinato, and S. Battiato, "Advanced car driving assistant system: A deep non-local pipeline combined with 1D dilated CNN for safety driving", in Proc. of the 2021 Int. Conf. on Image Processing and Vision Engineering (IMPROVE 2021), April 28-30, 2021, pp. 81-90. ISBN: 978-989-758-511-1. |
| Publication | A. Genovese, V. Piuri, F. Rundo, F. Scotti, and C. Spampinato, "Driver attention assistance by pedestrian/cyclist distance estimation from a single RGB Image: A CNN-based semantic segmentation approach", in Proc. of the 22nd IEEE Int. Conf. on Industrial Technology (ICIT 2021), Valencia, Spain, March 10-12, 2021, pp. 875-880. ISBN: 978-1-7281-5730-6. |
| Publication | M. Abukmeil, S. Ferrari, A. Genovese, V. Piuri, and F. Scotti, "Unsupervised learning from limited available data by β -NMF and dual autoencoder", in Proc. of the 27th IEEE Int. Conf. on Image Processing (ICIP 2020), Abu Dhabi, UAE, October 25-28, 2020, pp. 81-85. ISBN: 978-1-7281-6395-6. |
| Publication | R. Donida Labati, A. Genovese, V. Piuri, and F. Scotti, "Touchless palmprint and fingerprint recognition", in Advances in Computing, Informatics, Networking and Cybersecurity - A |

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| | Book Honoring Prof. Mohammad S. Obaidat's Significant Scientific Contributions, P. Nicopolitidis, S. Mistra, L. Yang, B. Zeigler, and Z. Ning (eds.), Springer-Nature, 2021 |
| Publication | A. Genovese, and M. Siegel, "The IEEE Instrumentation and Measurement Society Technical Committee TC-22: Intelligent Measurement Systems", in IEEE Instrumentation & Measurement Magazine, 2021, pp. 1-4 |
| Publication | Y. Zhai, Q. Ke, X. Liu, W. Zhou, Y. Xu, Z. Ying and J. Gan, J. Zeng, R. Donida Labati, V. Piuri, F. Scotti, "AntennaNet: Antenna Parameters Measuring Network for Mobile Communication Base Station Using UAV", in IEEE Transactions on Instrumentation and Measurement, February 16, 2021 |
| Publication | J. Zeng, B. Zhu, Y. Huang, C. Qin, J. Zhu, F. Wang, Y. Zhai, Y. Gan, Y. Chen, Y. Wang, R. Donida Labati, V. Piuri, F. Scotti, "Real-Time Segmentation Method of Lightweight Network For Finger Vein Using Embedded Terminal Technique", in IEEE Access, pp. 303-316, 2021 |
| Publication | T. Wang, N. Tan, X. Zhang, G. Li, S. Su, J. Zhou, J. Qiu, Z. Wu, Y. Zhai, R. Donida Labati, V. Piuri, F. Scotti, "A Time-Varying Sliding Mode Control Method for Distributed-Mass Double Pendulum Bridge Crane With Variable Parameters", in IEEE Access, pp. 75981-75992, 2021. ISSN: 2169-3536. |
| Publication | D. Braga, A. Madureira, F. Scotti, V. Piuri, A. Abraham, "An Intelligent Monitoring System for Assessing Bee Hive Health", in IEEE Access, pp. 89009-89019, 2021 |
| Publication | R. Donida Labati, D. De Angelis, B. Bertoglio, C. Cattaneo, F. Scotti and V. Piuri, "Automatic Face Recognition for Forensic Identification of Persons Deceased in Humanitarian Emergencies", in Proc. of the 2021 IEEE Int. Conf. on Computational Intelligence and Virtual Environments for Measurement Systems and Applications (CIVEMSA 2021), pp. 1-6, June 18-20, 2021 |
| Publication | F. Rundo, F. Trenta, R. Leotta, C. Spampinato, V. Piuri, S. Conoci, R. Donida Labati, F. Scotti, S. Battiato, "Advanced Temporal Dilated Convolutional Neural Network for a Robust Car Driver Identification", in Pattern Recognition. ICPR International Workshops and Challenges, Springer International Publishing, 2021. ISBN: 978-3-030-68792-2. |
| Publication | R. Donida Labati, V. Piuri, F. Rundo, F. Scotti, C. Spampinato, "Biometric Recognition of PPG Cardiac Signals Using Transformed Spectrogram Images", in Pattern Recognition. ICPR International Workshops and Challenges, Springer International Publishing, 2021. ISBN: 978-3-030-68792-2. |
| Research project | PSR 2020 – SEED. 3SUN – Real-world assessment of 3rd-generation Solar cells: a UNified scientific approach. |
| Research project | EU Horizon 2020 Research and Innovation Programme. MARSAL – Machine Learning-based Networking and Computing Infrastructure Management for Beyond 5G. |

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|---------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Research project | EU Horizon 2020 Research and Innovation Programme. MOSAICrOWN – Multi-Owner data Sharing for Analytics and Integration respecting Confidentiality and OWNeR control. |
| Research project | PRIN 2017 HOPE – High quality Open data Publishing and Enrichment. |
| Paper presentation | "Acute Lymphoblastic Leukemia detection based on adaptive unsharpening and Deep Learning", 2021 IEEE Int. Conf. on Acoustics, Speech, and Signal Processing (ICASSP 2021), Toronto, ON, Canada, June 9, 2021 |
| Paper presentation | "Pedestrian/cyclist distance estimation from a single RGB Image: A CNN-based semantic segmentation approach", 22nd IEEE Int. Conf. on Industrial Technology (ICIT 2021), Valencia, Spain, March 10, 2021 |
| Chairing activities | IEEE Italy Section Systems Council Chapter (April 2021 – Present) |

Recommended candidates^(*)

| Type (ADCOM, Fellow, Award –specify-) | First Name | Second Name | Family Name | Affiliation /Address | Motivation |
|---------------------------------------|------------|-------------|-------------|----------------------|------------|
| | | | | | |

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

The TC will organize, together with other IEEE members, the next edition of the International Conference on Computational Intelligence and Virtual Environments for Measurement Systems and Applications (CIVEMSA 2022). As the previous years, the conference will be an interesting venue for researchers and interested scholars to publish works and exchange ideas related, among others, to the key activities of the TC.

Topics in the scope of the CIVEMSA conference include

- Intelligent Measurement Systems
- Multi-Sensor Data Fusion & Intelligent Sensor Fusion
- Intelligent Monitoring & Control Systems
- Neural & Fuzzy Signal/Image Processing for Industrial, Environmental & Domotics Applications
- Machine & Deep Learning for Intelligent Systems
- Computational Intelligence Technologies for Robotics & Vision
- Computational Intelligence Technologies for Medical & Bioengineering Applications
- Hardware Implementation of Neural & Fuzzy Systems for Measurements
- Neural & Fuzzy Techniques for Quality Measurement

* Please add as many rows as needed

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)

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- Organization of internships on intelligent measurement systems
 - Theses supervision on intelligent measurement systems
 - Organization and promotion of conferences and workshops
 - Organization and chairing of special sessions
 - Presentation and dissemination of papers and tutorials
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TC convergence, synergy, cooperation with other TC, from I&M or other societies (max. 1000 char. Including spaces)

The TC-22 is planning joint activities with other societies and councils that have a similar scope, including organization and sponsorship of conferences and workshops, organization of special sessions, and organization of special issues in journals in the field of intelligent measurement systems.

Societies and councils include:

- IEEE Computational Intelligence Society
 - IEEE Systems Council
 - IEEE Biometrics Council
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Comments/Suggestions (max. 1000 char. Including spaces)
