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The Information Forensics and Security Technical Committee: Then, Now, and in the Future

The Information Forensics and Security Technical Committee (IFS-TC) is one of the 13 TCs in the IEEE Signal Processing Society (SPS). Its overarching mission is to foster and lead scientific and technological development in all aspects related to forensics and security in our society. With the ever-increasing sophistication of crimes and terrorism allied with the spread of fake news and misinformation, the need for scientifically based criteria to identify misconduct and crimes has surged. With the explosion of big data, the challenges became even greater. Designing techniques to aid in fighting back against such threats is the main objective of digital forensics. On the other hand, the questions regarding how to enforce proper communication channels, privacy, and public safety are the driving forces behind research in the security area.

The IFS-TC deals with topics that include creating ciphers for safe communications, designing biometric protection protocols to improve access control (e.g., mobile devices and protected facilities), and crowd monitoring in public spaces. It also considers topics related to identifying forgeries in multimedia objects, designing security protocols, communicating securely, and protecting digital (and sometimes physical) objects against copyright and trademark violation.

The committee comprises members from different backgrounds ranging from signal processing and computer vision to machine learning and artificial intelligence. Currently, the TC has 32 members but also counts more than 100 former members who contribute advice and direction.

Recent developments have driven the digital forensics and security areas to empower the existing techniques and widen their scope to consider social media and an ever more connected world. This increasingly high connectivity has brought a series of new research challenges, which now dictate the work in these areas. These new topics include how to deal with data protection in a highly connected society, preserve privacy, track criminal activities in the face of so many disguising options and immense troves of data, and process small messages and pinpoint authors, sentiments, trends, intents, and misinformation, among others. The techniques that have been developed to deal with the many previously mentioned problems range from finding telltales in the signals to sophisticated artificial intelligence-powered algorithms that sift through vast swaths of data looking for particular patterns.

These exciting research areas also need to be in agreement with the changes in our society, such as the recent General Data Protection Regulation law. Researchers in these areas need to be engaged in creating solutions that comply with and enforce the law.

In addition to fostering breakthrough research, the TC organizes several events in international workshops and conferences covering subjects related to forensics and security [e.g., the IEEE International Workshop on Information Forensics and Security (WIFS)]. The TC also oversees online challenges that seek to engage students to help solve particularly essential problems. Some examples include the IEEE IFS-TC International Challenge on Forensics to identify forgeries in images and the Break Our Steganographic System Challenge, which called the attention of students and researchers worldwide to detecting hidden messages in images.

In addition to sponsoring WIFS, the TC is strongly present in the organization of the two SPS flagship conferences, ICIP and ICASSP. The average number of IFS-TC papers in each of these events is more than 100.

The last TC-organized event was the 2019 WIFS, which took place in Delft, The Netherlands. The program chairs were Prof. Zekeriya Erkin (TU Delft), Prof. Luisa Verdoliva (University Federico II, Naples, Italy), and Prof. Rainer Böhme (University of Innsbruck, Austria). Figure 1 depicts the workshop's gala dinner event.

The committee also coordinates *IEEE Transactions on Information Forensics and Security* (*T-IFS*). *T-IFS* welcomes articles covering the science, technologies, and applications related to information forensics, information security, biometrics, surveillance, and systems applications. It is the top venue of publication in the mentioned areas with an impact factor above 6.0 at the time this article was written.

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Looking to the future, the main challenges we envision for the areas related to the TC include facing this new technological era with evermore connected services and appliances in a way that allows us to protect our citizens from abuses and, at the same time, prevent particular citizens from inflicting harm (physical or psychological) onto others. Furthermore, even in the case that we cannot stop such events from happening, we have to design techniques to make sure we understand who did it, how it happened, and in what circumstances.

The TC also maintains a website (https://signalprocessingsociety.org/get-involved/information-forensics-and-security/) packed with resources including data sets, job positions, ongoing technical challenges, and a bibliography, among others. Prospective readers interested in collaborating with the TC in these activities, and also in discussing new directions of research, technical challenges, and activities, can become an affiliate member through the webpage https://signalprocessingsociety.org/get-involved/information-forensics-and-security/affiliate-members. Join us. Become an affiliate member and help us shape a better society!

FIGURE 1. From left: Rainer Bohme (program chair), Zekeryia Erkin (general chair), Analisa Verdoliva (program chair), and Anderson Rocha (TC chair) smile at the 2019 WIFS gala dinner in Delft, The Netherlands.

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Anderson Rocha (anderson.rocha@unicamp.br) is currently the director of the Institute of Computing, University of Campinas, Brazil, and the 2019–2021 Information Forensics and Security Technical Committee chair. He has coordinated a series of international projects in digital forensics for the past 15 years, and has been recognized for his contributions to the field through important awards, such as the Google and Microsoft Research Faculty Fellow Awards and the Tan Chin Tuan Faculty Fellow award. He is a Senior Member of the IEEE.

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