Spotlight on the Multimedia Signal Processing Technical Committee [In the Spotlight]

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The Multimedia Signal Processing Technical Committee (MMSP-TC) of the IEEE Signal Processing Society (SPS) promotes the advancement of multimedia signal processing technology. The scope of the TC includes joint processing/representation of audio-visual and multimodal information, fusion/fission of sensor information or multimodal data, integration of media, art and multimedia technology, and analysis and feature extraction of multimodal data. Other key areas encompass virtual reality and 3D imaging, multimedia communications and networking, human-machine interface and interaction, visual and auditory quality assessment, multimedia databases and digital libraries. In this context, the TC also serves as an incubator of technologies that lie in the gaps between traditional areas.

Each year, the MMSP-TC organizes the IEEE International Workshop on Multimedia Signal Processing (MMSP), which attracts researchers from SPS and related communities that work on multimedia topics. Running as a single-track event, the workshop consists of oral and poster sessions, including special sessions that capture specific research trends. It also includes invited plenary presentations (in 2018, G. Durity from Electronic Arts, J.-N. Hwang from University of Washington, and H. Malvar from Microsoft Research) and panel discussions (in 2017, on deep learning in multimedia signal processing research). The workshop typically receives around 150 paper submissions and has more than 100 attendees from all over the world. The workshop has been effective at building a community around the thematic of multimedia signal processing, and it enjoys a good reputation among researchers/academics. To further strengthen the event, the TC is also considering means to more effectively engage industry and students. Pictures of the 2017 and 2018 events are shown in Figure 1 and Figure 2.

Figure 1: MMSP 2017 in London-Luton, UK.

Figure 2: MMSP 2018 in Vancouver, Canada, social event in Grouse Mountain.

The topics covered by MMSP-TC are regularly represented at the IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP) where the TC handles the MMSP track, coordinating papers review and forming the conference sessions. The MMSP-TC is also involved in the organization of the IEEE International Conference on Multimedia and Expo (ICME), the flagship multimedia conference sponsored by four IEEE societies (Signal Processing, Circuits and Systems, Communications and Computer). With its rising popularity, this conference nowadays attracts more than 1,000 submissions for regular program, and hosts numerous side events, such as thematic workshops and grand challenges, serving as a forum to promote the exchange of the latest advances in multimedia technologies, systems, and applications. The MMSP-TC also contributes to the editorial work of several IEEE journals. In particular, the TC collaborates with other IEEE societies that cover multimedia, enabling joint sponsorship of IEEE Trans. on Multimedia.

Enabling innovations at the intersection of various application areas, the TC has in recent years contributed to the advancement of signal processing methods in areas such as 3D multimedia and Augmented Reality (AR) / Virtual Reality (VR). Furthermore, advances in Machine Learning (ML) had lately the most significant impact on the TC's work. In particular, artificial intelligence has been successfully applied to various problems in media applications, such as multimedia creation and enhancement, media classification and segmentation, object detection and tracking, pose and action recognition, emotion and gesture recognition, multimodal media analysis, and social media analysis. Advances in deep learning have especially led to significantly more effective approaches for various traditional MMSP tasks, such as denoising and super-resolution.

Recent applications of advanced deep learning based approaches in image/video coding, media quality evaluation, and multimedia forensics have also indicated that signal processing can benefit from additional interactions with ML. More specifically, this penetration of ML in some traditional SPS areas opens new challenges, such as compression of deep neural networks (to enable their more efficient handling) and interpretability of trained networks (to use ML in an accountable way, as well as to design ML-inspired low-complexity algorithms). Furthermore, the synergy between signal processing and ML is setting new targets for the MMSP community, in particular for applications that require low complexity solutions and/or do not have enough training data.

The TC runs an election every year in order to appoint new members, who have a formal role and voting rights. In addition, the TC also counts nearly 200 affiliate members, who regularly receive communications and participate in discussions. SPS members interested in this thematic are encouraged to sign-up as affiliates on the TC website at https://signalprocessingsociety.org/get-involved/multimedia-signal-processing. Moreover, in order to foster discussion and strengthen the sense of community, since 2017 the TC holds a TC meeting during MMSP as an open forum where all workshop participants are welcome to attend. The next MMSP edition will be held in Kuala Lumpur, Malaysia, in September 2019 (http://mmsp2019.org/). Finally, we observed an increased popularity of grand challenges. Opportunities to submit grand challenges proposals will be available at ICME 2020, to be held in London, UK, in July 2020 (http://www.2020.ieeeicme.org/).

Authors

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