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<i>Prasad Tapkir, Ankur Patil, Neil Shah, Hemant Patil, Dhirubhai Ambani Institute of Information and Communication Technology, India</i>	
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<i>Shahab Pasha, ARC Research Hub for Australian Steel Manufacturing, Australia; Christian Ritz, David Stirling, University of Wollongong, Australia; Paul Zulli, ARC Research Hub for Australian Steel Manufacturing, Australia; David Pinson, Sheng Chew, BlueScope Steel, Australia</i>	
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<i>Daichi Kitahara, Maya Nakahara, Akira Hirabayashi, Ritsumeikan University, Japan; Eiichi Yoshikawa, Japan Aerospace Exploration Agency, Japan; Hiroshi Kikuchi, Tomoo Ushio, Tokyo Metropolitan University, Japan</i>	
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<i>Eita Nakamura, Ryo Nishikimi, Kyoto University, Japan; Simon Dixon, Queen Mary University of London, United Kingdom; Kazuyoshi Yoshii, Kyoto University, Japan</i>	
<b>TH-A1-P.9: SINGING VOICE CONVERSION USING POSTED WAVEFORM DATA ON MUSIC SOCIAL MEDIA .....</b>	<b>1913</b>
<i>Koki Senda, Yukiya Hono, Kei Sawada, Kei Hashimoto, Keiichiro Oura, Yoshihiko Nankaku, Keichi Tokuda, Nagoya Institute of Technology, Japan</i>	
<b>TH-A1-P.10: WEAKLY LABELED LEARNING USING BLSTM-CTC FOR SOUND EVENT DETECTION .....</b>	<b>1918</b>
<i>Taiki Matsuyoshi, University of Tsukuba, Japan; Tatsuya Komatsu, Reishi Kondo, NEC Corporation, Japan; Takeshi Yamada, Shoji Makino, University of Tsukuba, Japan</i>	
<b>TH-A1-P.12: UNSUPERVISED SINGING VOICE SEPARATION USING GAMMATONE AUDITORY FILTERBANK AND CONSTRAINT ROBUST PRINCIPAL COMPONENT ANALYSIS .....</b>	<b>1924</b>
<i>Feng Li, Masato Akagi, Japan Advanced Institute of Science and Technology, Japan</i>	
<b>TH-A1-P.13: EXPLORING REDUNDANCY OF HRTFS FOR FAST TRAINING DNN-BASED HRTF PERSONALIZATION .....</b>	<b>1929</b>
<i>Tzu-Yu Chen, Po-Wen Hsiao, Tai-Shih Chi, National Chiao Tung University, Taiwan</i>	
<b>TH-A1-P.14: REWARD ONLY TRAINING OF ENCODER-DECODER DIGIT RECOGNITION SYSTEMS BASED ON POLICY GRADIENT METHODS .....</b>	<b>1934</b>
<i>Yilong Peng, Hayato Shibata, Takahiro Shinozaki, Tokyo Institute of Technology, Japan</i>	
<b>TH-A1-P.15: FACTORISED HIDDEN LAYER BASED DOMAIN ADAPTATION FOR RECURRENT NEURAL NETWORK LANGUAGE MODELS .....</b>	<b>1940</b>
<i>Michael Hentschel, Nara Institute of Science and Technology, Japan; Marc Delcroix, Atsunori Ogawa, Tomoharu Iwata, Tomohiro Nakatani, NTT Communication Science Laboratories, Japan</i>	
<b>TH-A1-P.18: MULTI-LABEL PLAYLIST CLASSIFICATION USING CONVOLUTIONAL NEURAL NETWORK .....</b>	<b>1957</b>
<i>Guan-Hua Wang, Chia-Hao Chung, National Taiwan University, Taiwan; Yian Chen, KKBOX Inc., Taiwan; Homer Chen, National Taiwan University, Taiwan</i>	
<b>TH-A2-P: IMAGE, VIDEO AND MULTIMEDIA</b>	
<b>TH-A2-P.1: REAL-TIME BACKGROUND SUBTRACTION VIA L1 NORM TENSOR DECOMPOSITION .....</b>	<b>1963</b>
<i>Taehyeon Kim, Yoonsik Choe, Yonsei University, Korea (South)</i>	
<b>TH-A2-P.2: ROBUST IMAGE IDENTIFICATION FOR DOUBLE-COMPRESSED AND RESIZED JPEG IMAGES .....</b>	<b>1968</b>
<i>Kenta Iida, Hitoshi Kiya, Tokyo Metropolitan University, Japan</i>	
<b>TH-A2-P.3: OPTIMIZING THE PERFORMANCE OF HALFTONING-BASED BLOCK TRUNCATION CODING .....</b>	<b>1975</b>
<i>Zi-Xin Xu, Chengdu University of Information Technology, China; Yuk-Hee Chan, P.K. Daniel Lun, The Hong Kong Polytechnic University, China</i>	

<b>TH-A2-P.4: MODEL-BASED ENCODING PARAMETER OPTIMIZATION FOR 3D POINT CLOUD COMPRESSION</b>	<b>1981</b>
<i>Qi Liu, Hui Yuan, Shandong University, China; Junhui Hou, City University of Hong Kong, China; Hao Liu, Shandong University, China; Raouf Hamzaoui, De Montfort University, United Kingdom</i>	
<b>TH-A2-P.5: REFERENCE SAMPLES PADDING FOR INTRA-FRAME CODING OF OMNIDIRECTIONAL VIDEO</b>	<b>1987</b>
<i>Ning Li, Shuai Wan, Northwestern Polytechnical University, China; Fuzheng Yang, State Key Laboratory of Integrated Services Networks, Xidian University, China</i>	
<b>TH-A2-P.6: FULL COMPLEX HOLOGRAM REPRESENTATION METHOD USING DOE PHASE MASK</b>	<b>1991</b>
<i>Kwan-Jung Oh, Keehoon Hong, ETRI, Korea (South); Seung-Yeol Lee, KNU, Korea (South); Jisun Park, JLab, Korea (South)</i>	
<b>TH-A2-P.7: AUXILIARY STRUCTURE FOR CONVOLUTIONAL NEURAL NETWORK TRAINING</b>	<b>1995</b>
<i>Cheng-Yeh Chen, Chen-Kuo Chiang, National Chung Cheng University, Taiwan</i>	
<b>TH-A2-P.8: SUPERVISED SALIENCY MAPS FOR FIRST-PERSON VIDEOS BASED ON SPARSE CODING</b>	<b>2000</b>
<i>Yujie Li, The National Institute of Advanced Industrial Science and Technology (AIST), Japan; Atsunori Kanemura, The National Institute of Advanced Industrial Science and Technology (AIST), Advanced Telecommunications Research Institute International (ATR), LeapMind Inc., Japan; Hideki Asoh, The National Institute of Advanced Industrial Science and Technology (AIST), Japan; Taiki Miyanishi, Motoaki Kawanabe, Advanced Telecommunications Research Institute International (ATR), Japan</i>	
<b>TH-A2-P.9: FAST MONOCULAR VISION-BASED RAILWAY LOCALIZATION FOR SITUATIONS WITH VARYING SPEEDS</b>	<b>2006</b>
<i>Chu-Tak Li, Wan-Chi Siu, Hong Kong Polytechnic University, China</i>	
<b>TH-A2-P.10: ASSESSMENT OF VISION-BASED VEHICLE TRACKING FOR TRAFFIC MONITORING APPLICATIONS</b>	<b>2014</b>
<i>Dale Joshua Del Carmen, Rhandley Cajote, University of the Philippines Diliman, Philippines</i>	
<b>TH-A2-P.11: LAPPED CUBOID-BASED PERCEPTUAL ENCRYPTION FOR MOTION JPEG STANDARD</b>	<b>2022</b>
<i>Kosuke Shimizu, Taizo Suzuki, Keisuke Kameyama, University of Tsukuba, Japan</i>	
<b>TH-A2-P.12: SOUND RECOVERY USING VIBRATION MODES OF THE OBJECT IN A VIDEO</b>	<b>2027</b>
<i>Yohei Fuse, Yusuke Yasumi, Tetsuya Takiguchi, Kobe University, Japan</i>	
<b>TH-A2-P.13: A LUNG DISEASE CLASSIFICATION BASED ON FEATURE FUSION CONVOLUTIONAL NEURAL NETWORK WITH X-RAY IMAGE ENHANCEMENT</b>	<b>2032</b>
<i>Yue Cheng, Jinchao Feng, Kebin Jia, Beijing University of Technology, China</i>	
<b>TH-A2-P.14: IMPROVING POWER LINE DETECTION BASED ON PHASE DIFFERENCE IN RADAR IMAGE</b>	<b>2036</b>
<i>Dianqi Li, University of Washington, United States; Haoming Chen, Google, Inc, United States; Darren S. Goshi, Honeywell Corporation, United States; Ming-Ting Sun, University of Washington, United States</i>	
<b>TH-A2-P.15: IMPROVED VESSEL SEGMENTATION USING CURVELET TRANSFORM AND LINE OPERATORS</b>	<b>2041</b>
<i>Renoh Johnson Chalakkal, Waleed H Soni, The University of Auckland, New Zealand</i>	
<b>TH-A2-P.16: A DEEP LEARNING BASED FRAMEWORK FOR CONVERTING SIGN LANGUAGE TO EMOTIONAL SPEECH</b>	<b>2047</b>
<i>Nan Song, Hongwu Yang, Pengpeng Zhi, Northwest Normal University, China</i>	
<b>TH-A2-P.17: GPU-FRIENDLY APPROXIMATE BILATERAL FILTER FOR 3D VOLUME DATA</b>	<b>2054</b>
<i>Koichi Yano, Kenjiro Sugimoto, Sei-ichiro Kamata, Waseda University, Japan</i>	