ICASSP 2013 EDICS

1: Audio and Acoustic Signal Processing
- 1.1*: Room Acoustics and Acoustic System Modeling
- 1.2*: Transducers
- 1.3*: Loudspeaker and Microphone Array Signal Processing
- 1.4*: Active Noise Control
- 1.5*: Echo Cancellation
- 1.6*: Auditory Modeling and Hearing Aids
- 1.7*: Source Separation and Signal Enhancement
- 1.8*: Spatial and Multichannel Audio
- 1.9*: Audio Coding
- 1.10*: Audio Analysis and Synthesis
- 1.11*: Content-Based Audio Processing
- 1.12*: Audio for Multimedia
- 1.13*: Network Audio
- 1.14*: Audio Processing Systems
- 1.15*: Bioacoustics and Medical Acoustics
- 1.16*: Music Signal Processing

2: Bio Imaging and Signal Processing
- 2.1: Medical imaging
  - 2.1.1*: Image formation
  - 2.1.2*: Reconstruction and restoration
  - 2.1.3*: Computed tomography (CT, PET or SPECT)
  - 2.1.4*: Biomedical Imaging
  - 2.1.5*: Magnetic resonance imaging
  - 2.1.6*: Ultrasound imaging
- 2.2: Medical image analysis
  - 2.2.1*: Segmentation
  - 2.2.2*: Registration
  - 2.2.3*: Feature extraction and classification
- 2.3: Bioimaging and microscopy
  - 2.3.1*: Cellular and molecular imaging
  - 2.3.2*: Deconvolution and inverse problems
  - 2.3.3*: Segmentation and analysis
  - 2.3.4*: Tracking and motion analysis
- 2.4: Biomedical signal processing
  - 2.4.1*: Physiological signals (ECG, EEG, ...)
  - 2.4.2*: Detection and estimation

- 2.4.3*: Feature extraction and classification
- 2.4.4*: Multi-channel processing

2.5: Bioinformatics

- 2.5.1*: Genomics and proteomics
- 2.5.2*: Computational biology and biological networks

3: Image, Video, and Multidimensional Signal Processing

3.1: Image/Video Coding

- 3.1.1*: Still Image Coding
- 3.1.2*: Video Coding
- 3.1.3*: Stereoscopic and 3-D Coding
- 3.1.4*: Distributed Source Coding
- 3.1.5*: Image/Video Transmission

3.2: Image/Video Processing

- 3.2.1*: Image Filtering
- 3.2.2*: Restoration
- 3.2.3*: Enhancement
- 3.2.4*: Image Segmentation
- 3.2.5*: Video Segmentation and Tracking
- 3.2.6*: Morphological Processing
- 3.2.7*: Stereoscopic and 3-D Processing
- 3.2.8*: Image Feature Extraction
- 3.2.9*: Image Analysis
- 3.2.10*: Video Feature Extraction
- 3.2.11*: Video Analysis
- 3.2.12*: Modeling
- 3.2.13*: Biometrics
- 3.2.14*: Interpolation and Super-resolution
- 3.2.15*: Motion Detection and Estimation

3.3: Image Formation

- 3.3.1*: Remote Sensing Imaging
- 3.3.2*: Geophysical and Seismic Imaging
- 3.3.3*: Optical Imaging
- 3.3.4*: Synthetic-Natural Hybrid Image Systems

3.4: Image Scanning, Display, and Printing

- 3.4.1*: Scanning and Sampling
- 3.4.2*: Quantization and Halftoning
- 3.4.3*: Color Reproduction

- 3.4.4*: Image Representation and Rendering
- 3.4.5*: Display and Printing Systems
- 3.4.6*: Image Quality Assessment

3.5: Image/Video Storage, Retrieval

- 3.5.1*: Image and Video Databases
- 3.5.2*: Image Indexing and Retrieval
- 3.5.3*: Video Indexing, Retrieval and Editing

4: Design and Implementation of Signal Processing Systems

- 4.1*: Algorithm and architecture co-optimization
- 4.2*: Compilers and tools for DSP implementation
- 4.3*: DSP algorithm implementation in hardware and software
- 4.4*: Low-power signal processing techniques and architectures
- 4.5*: Programmable and reconfigurable DSP architectures
- 4.6*: System-on-chip architectures for signal processing

5: Industry Technology Track

5.1: DSP Chips and Architectures

- 5.1.1*: Mixed Signal Processing
- 5.1.2*: Special-Purpose and FPGA DSPs
- 5.1.3*: Host-Based Signal Processing
- 5.1.4*: Multiprocessor Architectures

5.2: DSP Tools and Rapid Prototyping

- 5.2.1*: DSP Simulation Tools
- 5.2.2*: Rapid Prototyping and languages
- 5.2.3*: DSP Libraries
- 5.2.4*: Operating Systems

5.3: Communication Technologies

- 5.3.1*: Cellular and Satellite Telephony
- 5.3.2*: Data Communications and Networking
- 5.3.3*: Sortware-Defined Radios
- 5.3.4*: Vocoders
- 5.3.5*: Power Line Communication
- 5.3.6*: RFID

5.4: Speech Processing Applications

- 5.4.1*: Speaker Recognition
- 5.4.2*: Speech Compression
- 5.4.3*: Speech Enhancement

5.4.4*: Speech Recognition
5.4.5*: Speech Synthesis

5.5: Multimedia and DTV Technologies
5.5.1*: DSP Implementations of Music, Speech, and Audio
5.5.2*: Image and Video Applications
5.5.3*: Standards and Format Conversions
5.5.4*: Internet and Teleconferencing

5.6: Adaptive Interference Cancellation
5.6.1*: Smart Antennas
5.6.2*: Active Sound Reduction
5.6.3*: Acoustic and Electrical Noise and Echo Cancellation
5.6.4*: Hands-Free Telephony

5.7: Automotive Applications
5.7.1*: Intelligent Dashboards, Vehicles, and Highways (IVHS)
5.7.2*: Engine Management
5.7.3*: Route Planning and Tracking
5.7.4*: New Consumer Applications

5.8: Defense and Security Applications
5.8.1*: Optical Correlation
5.8.2*: Decluttering Target Identification and Tracking
5.8.3*: DSP-Based Cryptography, Stenography, and Watermarking
5.8.4*: Radar and Sonar

5.9: Emerging DSP Applications
5.9.1*: Biometrics
5.9.2*: Biomedical
5.9.3*: Power Systems and Motor Controls
5.9.4*: Machine Learning

5.10*: Other ITT Topics

6: Information Forensics and Security

6.1: Watermarking and Steganography
6.1.1*: Theoretical models
6.1.2*: Algorithms
6.1.3*: Benchmarking and security analysis
6.1.4*: Steganography and steganalysis

6.2: Multimedia Forensics
6.2.1*: Sensor and channel forensics
6.2.2*: Tamper detection

- 6.2.3*: Anti-forensics and countermeasures
- 6.2.4*: Plagiarism and near-duplicate detection
- 6.2.5*: Robust hashing

6.3: Biometrics
- 6.3.1*: Biometric methods and modalities
- 6.3.2*: Biometric security
- 6.3.3*: Performance and evaluation

6.4: Communications and Network Security
- 6.4.1*: Jamming and anti-jamming
- 6.4.2*: Covert or stealthy communication
- 6.4.3*: Secret key extraction from channels
- 6.4.4*: Information theoretic security
- 6.4.5*: Network attacks, protection and monitoring

6.5: Signal Processing and Cryptography
- 6.5.1*: Multimedia encryption
- 6.5.2*: Signal processing in the encrypted domain
- 6.5.3*: Traitor tracing codes
- 6.5.4*: Visual secret sharing
- 6.5.5*: Side channel attacks
- 6.5.6*: Privacy protection

6.6: Applications
- 6.6.1*: Surveillance
- 6.6.2*: Content protection, identification and monitoring
- 6.6.3*: Cloud and distributed computing systems
- 6.6.4*: Smart grid and power/energy systems
- 6.6.5*: Social media and network systems

7: Machine Learning for Signal Processing
- 7.1*: Other applications of machine learning (MLR-APPL)
- 7.2*: Bayesian learning; Bayesian signal processing (MLR-BAYL)
- 7.3*: Cognitive information processing (MLR-COGP)
- 7.4*: Distributed and Cooperative Learning (MLR-DIST)
- 7.5*: Applications in Data Fusion (MLR-FUSI)
- 7.6*: Graphical and kernel methods (MLR-GRKN)
- 7.7*: Independent component analysis (MLR-ICAN)
- 7.8*: Information-theoretic learning (MLR-INFO)
- 7.9*: Learning theory and algorithms (MLR-LEAR)
- 7.10*: Applications in Music and Audio Processing (MLR-MUSI)

7.11*: Neural network learning (MLR-NNLR)
7.12*: Pattern recognition and classification (MLR-PATT)
7.13*: Bounds on performance (MLR-PERF)
7.14*: Sequential learning; sequential decision methods (MLR-SLER)
7.15*: Source separation (MLR-SSEP)
7.16*: Applications in Systems Biology (MLR-SYSB)

8: Multimedia Signal Processing
- 8.1: Multimodal signal processing
  - 8.1.1*: Joint processing/presentation of audio-visual information
  - 8.1.2*: Synchronization of audio and visual data
  - 8.1.3*: Fusion/fission of sensor information or multimodal data
  - 8.1.4*: Integration of media, art, and multimedia technology
- 8.2: Virtual reality and 3D imaging
  - 8.2.1*: 2D and 3D graphics/geometry coding and animation
  - 8.2.2*: 3D audio and video processing
  - 8.2.3*: Virtual reality and mixed-reality in networked environments
- 8.3: Multimedia communications and networking
  - 8.3.1*: Wireless and mobile multimedia communication
  - 8.3.2*: Media streaming, media content distribution, and storage
  - 8.3.3*: Quality of service provisioning
  - 8.3.4*: Cross-layer design for multimedia communication
  - 8.3.5*: Overlay, peer-to-peer, and peer-assisted networking for multimedia
  - 8.3.6*: Home networking for multimedia
  - 8.3.7*: Location-aware multimedia computing
  - 8.3.8*: Multimedia sensor and ad hoc networks
  - 8.3.9*: Media compression and related standardization activities
  - 8.3.10*: Multimedia watermarking
  - 8.3.11*: Distributed source and source-channel coding
- 8.4: Multimedia security and content protection
  - 8.4.1*: Data hiding
  - 8.4.2*: Authentication
  - 8.4.3*: Access control
  - 8.4.4*: Single and multi-media security
  - 8.4.5*: Multimedia forensics
  - 8.4.6*: Security applications of watermarking and fingerprinting
- 8.5: Multimedia human-machine interface and interaction
  - 8.5.1*: Human perception modelling

- 8.5.2*: Modeling of multimodal perception
- 8.5.3*: Human-human and human-computer dialog
- 8.5.4*: Multimodal interfaces
- 8.5.5*: Brain-computer interfaces

8.6: Quality Assessment

- 8.6.1*: Subjective visual quality assessment
- 8.6.2*: Objective visual quality assessment
- 8.6.3*: Subjective auditory quality assessment
- 8.6.4*: Objective auditory quality assessment
- 8.6.5*: Evaluation of user experience, cross-modal assessment
- 8.6.6*: Standardization activities

8.7: Multimedia databases and digital libraries

- 8.7.1*: Visual indexing, analysis and representation
- 8.7.2*: Audio indexing, analysis and representation
- 8.7.3*: Content-based and context-based information retrieval
- 8.7.4*: Knowledge and semantics in media annotation and retrieval
- 8.7.5*: Fingerprinting and duplicate detection

8.8: Multimedia computing systems and applications

- 8.8.1*: Multimedia system design
- 8.8.2*: Distributed multimedia systems
- 8.8.3*: Entertainment and gaming
- 8.8.4*: e-Health and telemedicine
- 8.8.5*: IP video/web conferencing
- 8.8.6*: e-learning

8.9: Hardware and software for multimedia systems

- 8.9.1*: Multimedia hardware design
- 8.9.2*: Real-time multimedia systems
- 8.9.3*: Implementations on graphics processing units (GPUs)
- 8.9.4*: Implementations on general-purpose processors, multimedia processors, DSPs, multi-core processors
- 8.9.5*: Implementations in portable/wearable systems
- 8.9.6*: Power-aware systems for multimedia

8.10: Haptic technology and interaction

- 8.10.1*: Processing and rendering of haptic signals
- 8.10.2*: Compression and transmission of haptic signals
- 8.10.3*: Audio-visual-haptic environments
- 8.10.4*: Multimedia applications using haptics

8.11: Bio-inspired multimedia systems and signal processing

- 8.11.1*: Bio-inspired signal processing for multimedia
- 8.11.2*: Multimodal signal fusion in humans and animals
- 8.11.3*: Joint bio-inspired and conventional multimedia signal processing

9: Sensor Array and Multichannel Signal Processing

- 9.1: Sensor Array Processing
  - 9.1.1*: Beamforming
  - 9.1.2*: Physics-based sensor array processing
  - 9.1.3*: Inverse methods
  - 9.1.4*: Array calibration methods
  - 9.1.5*: Synthetic aperture methods
  - 9.1.6*: Signal detection and parameter estimation
  - 9.1.7*: Direction-of-arrival estimation
  - 9.1.8*: Source localization, separation, classification, and tracking
  - 9.1.9*: Blind source separation and channel identification
- 9.2: Adaptive Array Signal Processing
  - 9.2.1*: Adaptive beamforming
  - 9.2.2*: Space-time adaptive processing
  - 9.2.3*: MIMO radar and waveform diversity
- 9.3: Multi-channel Signal Processing
  - 9.3.1*: Channel modelling and equalization
  - 9.3.2*: Multi-channel transceiver design
  - 9.3.3*: Sparsity structures in multichannel signal processing
  - 9.3.4*: Multi-channel processing with non-wave based sensors
  - 9.3.5*: Tensor-based signal processing for multi-sensor systems
- 9.4: Multi-antenna and Multi-channel Signal Processing for Communications
  - 9.4.1*: MIMO systems and algorithms
  - 9.4.2*: Space-time coding and decoding algorithms
  - 9.4.3*: MIMO space-time code design and analysis
  - 9.4.4*: Multi-user MIMO networks
  - 9.4.5*: Array processing for wireless communications
  - 9.4.6*: Multi-antenna/multi-channel processing for cognitive radios
- 9.5: Sensor and Relay Networks
  - 9.5.1*: Sensor and relay network signal processing
  - 9.5.2*: Network beamforming and coding
  - 9.5.3*: Distributed and cooperative processing
  - 9.5.4*: Data fusion and decision fusion from multiple sensor types
  - 9.5.5*: Multi-Sensor processing for smart grid and energy systems

9.6: Applications of Sensor Array and Multi-channel Signal Processing
- 9.6.1*: Radar array processing
- 9.6.2*: Sonar array processing
- 9.6.3*: Microphone array processing
- 9.6.4*: Multi-channel imaging
- 9.6.5*: Multi-channel biological and medical modelling and processing
- 9.6.6*: Other applications of SAM signal processing

10: Signal Processing Education
- 10.1*: Signal Processing Education

11: Signal Processing for Communications and Networking
- 11.1: Signal Transmission and Reception
  - 11.1.1*: Signal detection, estimation, separation and equalization
  - 11.1.2*: Channel modeling and estimation, training schemes
  - 11.1.3*: Capacity and performance analysis/optimization
  - 11.1.4*: Acquisition, synchronization and tracking
  - 11.1.5*: Signal representation, modulation, coding and compression
  - 11.1.6*: Joint source-channel coding and quantization, iterative decoding algorithms
- 11.2: Communication Systems and Applications
  - 11.2.1*: Multi-carrier, OFDM, and DMT communication
  - 11.2.2*: Multi-rate, CDMA and spread spectrum communication
  - 11.2.3*: Ultra wideband communication
  - 11.2.4*: Telephone networks, DSL and powerline communication
  - 11.2.5*: Applications involving signal processing for communication
  - 11.2.6*: Computation, Communication, and Control for Smart Grid
  - 11.2.7*: Communication/Networking Issues in Social Networks
  - 11.2.8*: Computation, Communication, and Control for Biological Networks
  - 11.2.9*: Underwater Communication Systems
  - 11.2.10*: Visible Light Communication Systems
  - 11.2.11*: Free Space Optical Communication
- 11.3: MIMO Communications and Signal Processing
  - 11.3.1*: MIMO precoder/decoder design, receiver algorithms
  - 11.3.2*: MIMO channel estimation and equalization
  - 11.3.3*: MIMO capacity and performance
  - 11.3.4*: MIMO space-time code design, analysis and decoding algorithms
  - 11.3.5*: MIMO multi-user and multi-access schemes

11.4: Communication and Sensing aspects of Sensor Networks, Wireless and Ad-Hoc Networks

- 11.4.1*: Distributed and collaborative signal processing
- 11.4.2*: Distributed channel and source coding, information-theoretic studies
- 11.4.3*: Ad-hoc wireless networks
- 11.4.4*: Physical layer issues, cross-layer design
- 11.4.5*: Scheduling and queuing protocols
- 11.4.6*: Power control, resource management, system level optimization
- 11.4.7*: Cognitive Radio and Dynamic Spectrum Access
- 11.4.8*: Collaborative Signal Processing for Smart Grid

12: Signal Processing Theory and Methods

12.1: Sampling and Reconstruction

- 12.1.1*: Sampling theory and methods
- 12.1.2*: Quantization
- 12.1.3*: Extrapolation and interpolation
- 12.1.4*: Signal reconstruction, restoration and enhancement
- 12.1.5*: Multidimensional sampling and reconstruction

12.2: Signal and System Modeling, Representation and Estimation

- 12.2.1*: System modeling
- 12.2.2*: Signal and noise modeling
- 12.2.3*: System identification and approximation
- 12.2.4*: Multidimensional systems
- 12.2.5*: Non-stationary signals and time-varying systems
- 12.2.6*: Time-frequency and time-scale analysis
- 12.2.7*: Blind and semi-blind source separation

12.3: Statistical Signal Processing

- 12.3.1*: Detection and estimation theory and methods
- 12.3.2*: Classification and pattern recognition
- 12.3.3*: Cyclostationary signal analysis
- 12.3.4*: Higher-order and fractional lower-order statistical methods
- 12.3.5*: Performance analysis and bounds
- 12.3.6*: Spectrum estimation theory and methods
- 12.3.7*: Robust methods
- 12.3.8*: Independent component analysis
- 12.3.9*: Monte-Carlo based signal processing methods

12.4: Adaptive Signal Processing

- 12.4.1*: Adaptive filter analysis and design

12.4.2*: Fast algorithms for adaptive filtering
12.4.3*: Frequency-domain and transform-based adaptive filtering
12.4.4*: Sequential decision theory and methods
12.4.5*: Performance analysis and bounds
12.4.6*: Distributed and collaborative signal processing

12.5: Nonlinear Systems and Signal Processing
12.5.1*: Median, rank-order and stack type filters
12.5.2*: Non-Gaussian distribution filters
12.5.3*: Nonlinear signal and system models
12.5.4*: Nonlinear random process models
12.5.5*: Nonlinear adaptive filters

12.6: Filter Design
12.6.1*: Filter design criteria and optimization methods
12.6.2*: Filter architectures
12.6.3*: Performance analysis

12.7: Multirate Signal Processing
12.7.1*: Multirate architectures
12.7.2*: Filterbanks and wavelets
12.7.3*: Multirate processing and multiresolution methods
12.7.4*: Hierarchical models and tree-structured signal processing

13: Speech Processing

13.1: Speech Production (SPE-SPRD)
13.1.1*: Physical models of the vocal production system
13.1.2*: Singing and properties of the musical voice

13.2: Speech Perception and Psychoacoustics (SPE-SPER)
13.2.1*: Models of Speech Perception
13.2.2*: Hearing and Psychoacoustics
13.2.3*: Physiological models and applications thereof
13.2.4*: Audiology applications

13.3: Speech Analysis (SPE-ANLS)
13.3.1*: Spectral and other time-frequency analysis techniques
13.3.2*: Distortion measures
13.3.3*: Pitch/fundamental frequency analysis
13.3.4*: Timing/duration/speaking rate analysis
13.3.5*: Acoustic-phonetic features (e.g., formants etc)
13.3.6*: Extraction of non-linguistic information (e.g., gender, emotion, etc)
13.3.7*: Voice quality/speech disorders

13.4: Speech Synthesis and Generation, including TTS (SPE-SYNT)

- 13.4.1*: Segmental-Level and/or concatenative synthesis
- 13.4.2*: Signal Processing/Statistical Model for synthesis
- 13.4.3*: Articulatory Synthesis
- 13.4.4*: Parametric Synthesis
- 13.4.5*: Prosody, Emotional, and Expressive Synthesis
- 13.4.6*: Text-to-phoneme conversion
- 13.4.7*: Voice Quality
- 13.4.8*: Voice Transformation
- 13.4.9*: Audio/Visual speech synthesis
- 13.4.10*: Multilingual synthesis
- 13.4.11*: Quality assessent/evaluation metrics in synthesis
- 13.4.12*: Tools and data for speech synthesis
- 13.4.13*: Text processing for speech synthesis (text normalization, syntactic and semantic analysis)

13.5: Speech Coding (SPE-CODI)

- 13.5.1*: Narrow-band and wide-band Speech Coding
- 13.5.2*: Theory and techniques for signal coding (e.g., waveform, transform)
- 13.5.3*: Modulation and source/channel coding
- 13.5.4*: Quantization and compression
- 13.5.5*: Robust coding for noisy channels
- 13.5.6*: Voice Over IP (VOIP)
- 13.5.7*: Quality assessent/evaluation metrics (e.g., PESQ) in coding

13.6: Speech Enhancement (SPE-ENHA)

- 13.6.1*: Control and reduction of channel noise (e.g., reverb, room response)
- 13.6.2*: Perceptual enhancement of non-noisy speech
- 13.6.3*: Speech enhancement for humans with hearing impairments
- 13.6.4*: Non-acoustic microphones for enhancement
- 13.6.5*: Bandwidth expansion
- 13.6.6*: Noise Reduction

13.7: Acoustic Modeling for Automatic Speech Recognition (SPE-RECO)

- 13.7.1*: Feature Extraction
- 13.7.2*: Low-level feature modeling - Gaussians & beyond
- 13.7.3*: Pronunciation modeling at the acoustic level
- 13.7.4*: State clustering and novel state definitions
- 13.7.5*: Prosody and other speech characteristics
- 13.7.6*: Dialect, accent, and idiolect at the acoustic level
- 13.7.7*: Discriminative Acoustic Training Methods for ASR

- 13.7.8*: Articulatory and physiological modeling
- 13.7.9*: Feature Transformation and Normalization

13.8: Robust Speech Recognition (SPE-ROBU)

- 13.8.1*: Features specifically for robust ASR (noise, channel, etc)
- 13.8.2*: Model/backend based robust ASR
- 13.8.3*: Confidence measures and rejection
- 13.8.4*: Speech Activity/End-point/Barge-in detection
- 13.8.5*: Non-acoustic microphones for ASR

13.9: Speech Adaptation/Normalization (SPE-ADAP)

- 13.9.1*: Speaker adaptation and normalization (e.g., VTLN)
- 13.9.2*: Speaker adapted training methods
- 13.9.3*: Environmental/Channel adaptation
- 13.9.4*: Idiolect adaptation
- 13.9.5*: Register and/or dialect adaptation

13.10: General Topics in Speech Recognition (SPE-GASR)

- 13.10.1*: Distributed Speech Recognition - Client/Server methods
- 13.10.2*: Alternative Statistical/Machine Learning Methods (e.g., no HMMs)
- 13.10.3*: Word spotting
- 13.10.4*: Metadata (e.g., emotion, speaker, accent) extraction from acoustics
- 13.10.5*: New algorithms, computational strategies, data- structures for ASR
- 13.10.6*: Multi-modal (such as audio-visual) speech recognition
- 13.10.7*: Corpora, annotation, and other resources
- 13.10.8*: Algorithm approximation methods in ASR
- 13.10.9*: Structured classification approaches

13.11: Multilingual Recognition and Identification (SPE-MULT)

- 13.11.1*: Language (LID) and dialect (DID) identification
- 13.11.2*: Multilingual Speech recognition
- 13.11.3*: Processing of non-native accents

13.12: Lexical Modeling and Access (SPE-LEXI)

- 13.12.1*: Pronunciation modeling at the lexical level
- 13.12.2*: Dialect, accent, and idiolect at the lexical level
- 13.12.3*: Multilingual aspects (e.g., unit selection)
- 13.12.4*: Automatic lexicon learning

13.13: Large Vocabulary Continuous Recognition/Search (SPE-LVCR)

- 13.13.1*: Decoding algorithms and implementation
- 13.13.2*: Lattices
- 13.13.3*: Multi-pass strategies
- 13.13.4*: Miscellaneous Topics

13.14: Speaker Recognition and Characterization (SPE-SPKR)
- 13.14.1*: Features and characteristics for speaker recognition
- 13.14.2*: Robustness to variable and degraded channels
- 13.14.3*: Verification, identification, segmentation, and clustering
- 13.14.4*: Speaker characterization and adaptation
- 13.14.5*: Speaker recognition with speech recognition
- 13.14.6*: Speaker confidence estimation
- 13.14.7*: Multimodal and multimedia human speaker recognition
- 13.14.8*: Corpora, annotation, evaluation, and other resources
- 13.14.9*: Higher-level knowledge in speaker recognition
- 13.14.10*: Speaker localization (space) (e.g., in meetings)
- 13.14.11*: Speaker diarization (time) (e.g., in meetings)
- 13.14.12*: Speaker clustering (e.g., in Broadcast news)

13.15: Resource constrained speech recognition (SPE-RCSR)
- 13.15.1*: Low-power speech recognition
- 13.15.2*: Reduced computation speech recognition
- 13.15.3*: ASR techniques for highly portable/mobile devices

14: Spoken Language Processing

14.1: Spoken Language Understanding (SLP-UNDE)
- 14.1.1*: Semantic classification
- 14.1.2*: Entity extraction from speech
- 14.1.3*: Spoken document summarization
- 14.1.4*: Topic spotting and classification
- 14.1.5*: Question/answering from speech
- 14.1.6*: Paralinguistic (emotion, age, gender, rate, etc.) information
- 14.1.7*: Nonlinguistic (meaning external to language) information, gestures, etc.
- 14.1.8*: Detecting linguistic/discourse structure (e.g., disfluencies, sentence/topic boundaries, speech acts)
- 14.1.9*: Relation to and interpretation of sign language

14.2: Human Spoken Language Acquisition, Development and Learning (SLP-LADL)
- 14.2.1*: Language acquisition, development, and learning models
- 14.2.2*: Computer aids for language learning
- 14.2.3*: Attributes and modeling techniques for assessment of language fluency

14.3: Spoken and Multimodal Dialog Systems and Applications (SLP-SMMD)
- 14.3.1*: Spoken and multimodal dialog systems, applications, and architectures
- 14.3.2*: Stochastic Learning for dialog modeling
- 14.3.3*: Response Generation

- 14.3.4*: Technologies for the aged
- 14.3.5*: Evaluation metrics and standards
- 14.3.6*: Speech/voice-based human-computer interfaces (HCI)
- 14.3.7*: Speech HCI for individuals with impairments (blindness, etc.) and universal access (UA)
- 14.3.8*: Other applications

14.4: Speech Data Mining (SLP-DM)

- 14.4.1*: Analysis, Tools, Evaluations, and Applications for mining spoken data
- 14.4.2*: Speech data mining theory, algorithms, and methods
- 14.4.3*: Mining heterogeneous speech and multimedia data

14.5: Speech Retrieval (SLP-IR)

- 14.5.1*: Spoken term detection
- 14.5.2*: Search/retrieval of speech documents
- 14.5.3*: Voice search

14.6: Machine Translation of Speech (SLP-SSMT)

- 14.6.1*: Semi-automatic and data driven methods
- 14.6.2*: Speech processing for MTS
- 14.6.3*: Corpora, annotation, and other resources
- 14.6.4*: Interlingua and transfer approaches
- 14.6.5*: Integration of speech and linguistic processing
- 14.6.6*: Machine transliteration for named entities
- 14.6.7*: Evaluation metrics (e.g., BLEU)
- 14.6.8*: Systems and applications for MTS

14.7: Language Modeling, for Speech and SLP (SLP-LANG)

- 14.7.1*: N-grams, their generalizations and smoothing methods.
- 14.7.2*: Language Model Adaptation
- 14.7.3*: Grammar based language modeling
- 14.7.4*: Maxent and feature based language modeling
- 14.7.5*: Dialect, accent, and idiolect at the language level
- 14.7.6*: Discriminative LM Training Methods
- 14.7.7*: Other approaches to LMs
- 14.7.8*: Structured classification approaches

14.8: Spoken language resources and annotation (SLP-REAN)

- 14.8.1*: General corpora, annotation, and other resources