

Chang D. Yoo

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Professional

Interests

Machine Learning for Speech/Music/Audio/Image/Video Processing

Education

Massachusetts Institute of Technology	Cambridge, MA
Ph.D. degree in Electrical Engineering (Advisor: Jae S. Lim)	September 1996
Cornell University	Ithaca, NY
M.S. degree in Electrical Engineering (Advisor: Simon Wong)	August 1988
California Institute of Technology	Pasadena, CA
B.S degree in Engineering and Applied Science (Advisor: Hardy Martel)	June 1986

Experience

Korea Advanced Institute of Science and Technology	Daejeon, Korea
<i>Professor</i>	March 1999—Present
Korea Advanced Institute of Science and Technology	Daejeon, Korea
<i>Dean of International Relations</i>	November 2013—2015
Korea Advanced Institute of Science and Technology	Daejeon, Korea
<i>Dean of Special Projects and Institutional Relations</i>	November 2011—2013
Massachusetts Institute of Technology	Cambridge, MA
<i>Visiting Scholar</i>	March 2005—March 2006 March 2015—March 2016
Samsung Research	Seoul, Korea
<i>Consultant</i>	October 2022 – October 2023
Korea Telecom	Seoul, Korea
<i>Senior Researcher</i>	January 1997—March 1999
Korean Military	Youngchun, Korea
<i>Officer training program. Second Lieutenant</i>	November 1988—May 1989

Professional

Activities

Editorial Board: Journal of Signal Processing Systems (Springer), 2015 – *Present*
Associate Editor: IEEE Transactions on Audio, Speech and Language Processing (2011-2014), IEEE Transactions on Information Forensics and Security (2012-2013), IEEE Signal Processing Letters (2011-2012)
TPC: ICSLP (Interspeech) 2004, ICONIP 2000, ACCV 2012, ICANN 2011
Tutorial Presenter: ICSLP, IEEE ROMAN 2007
General Chair: ICCE-ASIA 2018, IWDW 2018, IPFGRU 2011-2013
Area Chair: ICCV 2019, ECCV 2020, ICASSP 2022, ICASSP 2023, ECCV 2024
Tutorial Chair: ICSLP 2010, ACPR 2021

Awards and

Honorary/

Professional

Societies

Recipient of POSCO Scholarship (1986 – 1996)
Member of Tau Beta Pi (1984), Sigma Xi (1994)
SPIE'2013-2020 Program Committee Member, IEEE MLSP 2011-2013 Technical Committee Member, IEEE Senior Member (2011),
ISCA Member (2002 – *Present*)
Vice-President IEIE (2019 – *Present*)

President AI Association Korea (2019 – 2023)
Consulting Professor at Samsung Research (2022.10 – 2023.09)
Best Lecture Award (2009, awarded by the Department of Electrical Engineering)
Achievement Award (2011, The Institute of Electronics Engineers of Korea)
Excellence Award (2020 Engineering School Technology Innovation Award)

Research Grants

Multi-modal Generative AI for Summarization
Samsung 2023/06/01-
Development of Emergency Target Identification and Pose Estimation Technology Based on SAR Imagery
Hanwha System 2023/06/01-
Research on Scene Understanding and Causal Inference for Image-Based Surveillance and Reconnaissance
CARAI 2023/06/01-
Visual Dialogue System: Developing Visual and Language Capabilities for AI-Based Dialogue Systems
KT 2023/01/01-
Development of High-Performance Flexible Piezoelectric Smart Sensors for Enhanced Multisensory Hearing and Touch
HumanPlus 2023/01/01-2023/12/31
Development of Block Detection and Classification Model for Calculating Progress Based on Imaging
Hyundai Samho Heavy Industries 2023/01/01-2023/05/17
Development and Study of AI Technologies to Inexpensively Conform to Evolving Policy on Ethics
IITP 2022/04/01-
Development of Uncertainty-Aware Agents Learning by Asking Question
ETRI 2022/03/01-
Development of a Multimodal Dialogue System Capable of Continuous Learning and Causal Reasoning Based on Video Search
NRF, MSIT 2022/03/01-
Enhancing CD SEM Image Quality and Inter-Facility Image Transfer Technology using Deep Learning
Samsung 2021/06/01-2023/06/01
Development of Causal AI through Video Understanding and Reinforcement Learning, and Its Applications to Real Environments
IITP 2021/04/01-
Development of framework for analyzing, detecting, mitigating of bias in AI model and training data
IITP 2019/04/01-
Research on improvement of detection rate of radar target based on artificial intelligence
LIG 2019/04/01-2020/02/28
Research on status inference and risk prediction of power distribution facility based on image recognition
KEPCO 2017/09/01-2021/12/31
The technology development for event recognition/relational reasoning and learning knowledge based system for video understanding (VTT Center)
IITP, MSIT 2017/06/01-2021/12/31
Development for an Android Malware Detection Algorithm based on Deep Learning
Samsung Electronics 2015/07/10-2015/12/31
Deep Learning Research for Multiview Car Reidentification
Hanwha Techwin 2015/07/01-2015/12/31

Deep Learning Research for Crowd Behavior Analysis System	
Hanwha Techwin	2015/07/01-2015/12/31
Basic Research of Human-level Lifelong Machine Learning SW	
Ministry of Science, ICT and Future Planning Machine Learning Center	2014/04/01-
Automatic Speech Translation	
ETRI	2013/05/01-
Multi-modal Emotion Recognition based on Speech and Facial Expression	
Ministry of Trade, Industry and Energy	2012/12/01-
Driver-Assistant Active Safety System: Intelligent driver assistance system based on irregular behavior detection and augmented reality	
NCRC	2010/09/01-2013/02/28
Development of Analytical Techniques of Face Attribute	
Samsung Electronics	2014/05/10-2014/12/31
Object Classification for Automatic Image Annotation	
LG Electronics	2014/03/24-2014/11/28
Acoustic user interface	
Hyundai Motor	2013/05/01-2014/08/31
Cognitive Multimedia Fingerprinting for Next Generation Fast Semantic Retrieval on the Large Scale Data	
NRF	2011/05/01-2014/04/30
Intelligent behavior pattern analysis for surveillance system	
KT	2013/08/01-2013/12/31
Object Recognition for automatic tagging	
KT	2013/05/10-2013/12/31
Speech-based human-robot interaction system	
Robot Center	2013/05/01-2014/04/30
High-level image representation for visual recognition	
Confidential	2013/03/25-2013/11/25
P3 DigiCar: Smart Sensing Technique for Active Safety	
NCRC	2010/09/01-2013/02/28
21C Frontier Intelligent Robotics	
Ministry of Knowledge Economy	2009/06/01-2013/03/31
Research center for robot intelligence technology	
Ministry of Knowledge Economy	2009/05/01-2013/04/30
Airang Satellite Image Restoration	
KARI	2011/04/01-2012/06/30
Copyright protection for multimedia data	
Ministry of Culture, Sports and Tourism	2009/03/01-2012/02/29
Multimedia Retrieval, Analysis and Transmission System in Wireless Internet	
NRF	2007/09/01-2010/08/31
Image contents annotation, search/retrieval system	
KT	2009/12/28-2010/06/25
Media analysis, summary, and management system	
Pandora	2009/06/01-2010/01/31
Underdetermined Blind Source Separation	
ETRI	2009/05/01-2010/01/31
Basic Research Program	
Korea Research Foundation	2008/07/15-2009/07/14
Content Based Audio Retrieval/Classification System	
Pandora	2008/07/15-2009/02/28
Speaker Recognition System	
ETRI	2008/09/01-2009/02/28
21C Frontier Intelligent Robotics	
The Ministry of Commerce, Industry and Energy	2007/04/01-2009/03/31

Development of interoperable wearable ubiquitous computer terminal device technology	Ministry of Information and Communication, Korea	2005/03/01-2008/02/29
Real-time multiview video coding	ETRI	2007/06/22-2007/11/30
Development of content-based music recommendation system	Pandora TV	2007/06/15-2008/11/30
Development of fingerprinting system supporting high speed search for large volume video/audio contents	Hanmaro	2006/04/01-2006/11/15
DSP implementation of MPEG-4 ER-BSAC	TI	2005/12/01-2006/11/30
Research of future video coding	ETRI	2006/06/01-2006/11/30
Recognition based on multimodal and integral processing method and 3-D audio Research	KOSEF	2003/09/01-2006/08/31
Development of IT-based robot system for intelligent services	ITRC	2003/08/01-2006/07/31
Audio and video fingerprinting systems for copyright protection	ETRI	2005/05/20-2005/12/10
Multiple description coding (MDC) for audio/video codec	ETRI	2005/11/01-2005/12/10
Development of acoustic echo cancellation algorithm	ETRI	2004/06/23-2004/12/31
Surveillance Real-Time MPEG4 Encoder	DVR	2004/06/01-2004/12/31
Audio fingerprinting system for copyright protection	ETRI	2004/02/01-2004/12/03
Efficient Signal Processing Methods for Multimedia Communications	KOSEF	2000/09/01-2003/08/31
Tandemless transcoding algorithm for SMV and VoIP system	ETRI	2002/04/12-2003/01/20
Development of remote speech recognition system	ETRI	2002/01/21-2002/10/20
Voiced Speech Extraction and Recognition System	SAIT	2001/03/01-2002/02/28
Speech Recognition System for Television Set	LG	2000/11/01-2002/01/31
Tandemless transcoding between AMR and EVRC	SAIT	2001/02/12-2001/11/30
Echo Cancellation for Mobile Communication	LG	2000/08/01-2001/07/31
Speech Recognition for Hurosot Robot	Hurosot	2000/06/01-2001/06/31
Video Watermarking for HDVDP	LG	2000/04/01-2001/03/31
DSP Implementation of Speech Coding	Dacom	1999/12/01-2000/11/30

Patents

Enrollment

Method and Device for Learning Neural Network Patent No. KR 10-2593438 (2023.10.19)
Method and Apparatus for Detecting Radar Target Based on Artificial Intelligence Patent No. KR 10-2557458 (2023.07.14)
Method and Device for Learning Multimodal Data Patent No. KR 10-2387305 (2022.04.12)

Environment sound recognition method based on convolutional neural networks, and system thereof Patent No. KR 10-2235568 (2021.03.29)

Apparatus and method for analyzing behavior pattern Patent No. KR 10-2217253 (2021-02-10)

Voice Recognition Method using Multiple Channels Patent No. KR 10-2184932 (2020.11.25)

Super-resolution Network Processing Method and System Patent No. KR 10-2059529 (2019.12.19)

Sampling-based DNA data compensation algorithm Patent No. KR 10-2059500 (2019.12.19)

Image Deblurring Network Processing Methods and Systems Patent No. KR 10-2056073 (2019.12.10)

Image Segmentation Method using Higher-Order Clustering, System for Processing the Same and Recording Medium for Storing the Same Patent No. US 9111356 (2015-08-18)

Method and system for producing multimedia fingerprint based on quantum hashing Patent No. US 8533848 (2013-09-10)

Face detection device and method using region-based feature Patent No. KR 10-1449744 (2014.10.02)

Method for Reversible Image Watermarking Based on Integer-to-Integer Wavelet Transform Patent No. US 8265334 (2012-09-11)

Apparatus and method of voice recognition system for AV system. Patent No. US 8046223 (2011-10-25)

Face Detection System using Skin Color Filtering and Morphology Process and Method. Patent No. KR 10-1143555 (2012-04-30)

Automatic Face Alignment System for Robust Face Recognition and Method Therefor. Patent No. KR 10-1096049 (2011-12-13)

Apparatus and method of classifying image block and apparatus and method of classifying scene using the same. Patent No. KR 10-1126364 (2012-03-06)

User adaptive image management system and user adaptive image management method. Patent No. KR 10-1134615 (2012-04-02)

Method and apparatus of clustering image and method and apparatus of recognizing image using the same. Patent No. KR 10-1089504 (2011-11-29)

An apparatus and a method for detecting pirated multimedia contents in user created contents. Patent No. KR 10-1094896 (2011-12-09)

Apparatus and Method for high-dimensional binary data search Patent No. KR 10-1081459 (2011-11-02)

Method for Melody Line Decision from Melody Pitch Candidates based on Melody Line Properties. Patent No. KR 10-1079743 (2011-10-28)

Method for Melody Pitch Candidate Extraction of Polyphonic Audio based on Harmonic Structure Model. Patent No. KR 10-1093725 (2011-12-07)

Method for Spectral Analysis of Polyphonic Audio by Using Variable Length Window Patent No. KR 10-1095968 (2011-12-13)

An apparatus and a method for Melody Extraction of Polyphonic Audio by using Harmonic Structure Model and Variable Length Window. Patent No. KR 10-1106185 (2012-01-09)

Method and apparatus for providing web storage service storing multimedia contents and metadata separately. Patent No. KR 10-1134597 (2012-04-02)

A speech emotion recognition model generation method using a Max-margin framework incorporating a loss function based on the Watson-Tellegen's Emotion Model. Patent No. KR 10-1116236 (2012-02-07)

Distance metric learning method for fingerprint matching of content identification system. Patent No. KR 10-1071728 (2011-10-04)

Method and system for producing multimedia fingerprint based on quantum hashing. Patent No. KR 10-1030306 (2011-04-13)

Apparatus and method for stereo matching which is robust to ambiguities in untextured regions and occlusions. Patent No. KR 10-1099648 (2011-12-21)

Method and apparatus for content-based image retrieval which is robust against resizing, rotation, and cropping. Patent No. KR 10-1063139 (2011-08-31)

Method for Eliminating aliasing in subband adaptive filtering system and alias free subband adaptive filtering system. Patent No. KR 10-0881698 (2009-01-28)
Method for reversible image watermarking based on integer-to-integer wavelet transform. Patent No. KR 10-0898329 (2009-05-12)
An apparatus for constructing a acoustic model based on the hidden markov model and a method thereof. Patent No. KR 10-0933774 (2009-12-16)
Fingerprint Producing Method and Audio Fingerprinting System Based on Normalized Spectral Subband Centroids. Patent No. KR 10-0733145 (2007-06-21)

Pending

Training Device, Method, and Automatic Speech Recognition Device for Enhancing Voice Recognition of Non-Native Speakers Appl.No. KR 10-2023-0177087, (Pending)
Method and Device for Physical Knowledge Distillation for Diffusion Models Appl.No. KR 10-2023-0110575, (Pending)
Method and Device for Image Moment Retrieval Based on Selective Bias Elimination Appl.No. KR 10-2022-0154621, (Pending)
System and Method for Instance Segmentation on Point Clouds Appl.No. KR 10-2023-0075139, (Pending)
Disambiguation Device for Semantic Preservation in Sentence Blending Appl.No. KR 10-2022-0168934, (Pending)
System and Method for Performing Reinforcement Learning by Setting Hindsight Goal Ranking for Replay Buffer Appl.No. KR 10-2022-0176780, (Pending)
Computing Apparatus and Method for Implementing End-to-End Deep Learning Framework for Sample-Efficient Image-Based Reinforcement Learning Appl.No. KR 10-2022-0173811, (Pending)
Method and Apparatus for Weakly-Supervised Learning Video Corpus Moment Retrieval Appl.No. KR 10-2022-0168698, (Pending)
Method and apparatus for training a neural network using modality signals of different domains Appl.No. US 16/131,841, (Pending)
Method and System for Detection and Classifying Object of Image Appl.No. US, EU, CN, WO 18/023,056, 20951161.6, 2023071700346240, 012450 (Pending)
Electronic device and control method thereof Appl.No. US 16/764,677, (Pending)
Domain Hybrid Learning for Multimodal data Appl.No. US 16/764,677, (Pending)
Method for Detecting A Face Included In an Image and a Device Therefore Appl.No. US, KR 16/001,401, 10-2019-0060230, (Pending)
Domain Hybrid Learning for Multimodal data Appl.No. WO 013824, (Pending)
Multimodal Sequential learning based on sequence puzzle network Appl.No. US 16/131,841, (Pending)
Continuous phoneme recognition method using semi-markov model, system processing the method and recording medium. Appl.No. US/KR 10-2012-0006898, (Pending)
Image partitioning method using high-order correlation clustering, system processing the method and recording medium. Appl.No. US/KR 10-2012-0006668 , (Pending)
Image partitioning method using correlation clustering, system processing the method and recording medium. Appl.No. KR 10-2012-0006669, (Pending)
Augmented reality system for head-up display. Appl.No. KR 10-2011-0073883, (Pending)
Advanced Driver Assistance Systems for Active Safety Driving using Driver Adaptive Irregular Behavior Detection. Appl.No. KR 10-2011-0078637, (Pending)
System for extracting multimedia contents descriptor and method therefor. Appl.No. KR 10-2009-0075392 , (Pending)
Method and system for producing multimedia fingerprint based on quantum hashing. Appl.No. US 12/372,765 (Pending)
Apparatus and method for speaker-recognition using history of speaker-recognition result. Appl.No. KR 10-2007-0003798, (Pending)

Publications

Research Areas

Speech

Speech publications

Music/Audio

Image

Liming Wang, Mark Hasegawa-Johnson, Chang D. Yoo, “Unsupervised Speech Recognition with N-Skipgram and Positional Unigram Matching”, The International Conference on Acoustics, Speech, & Signal Processing (ICASSP) 2024.

Video

Robotics

Fairness/Causality

Heting Gao, Mark Hasegawa-Johnson, Chang D. Yoo, “G2PU: Grapheme-to-Phoneme Transducer with Speech Units”, The International Conference on Acoustics, Speech, & Signal Processing (ICASSP) 2024.

Language

SooHwan Eom, Eunseop Yoon, Hee Suk Yoon, Chanwoo Kim, Mark Hasegawa-Johnson, Chang D. Yoo, “ADAMER-CTC: Connectionist Temporal Classification with Adaptive Maximum Entropy Regularization for Automatic Speech Recognition”, The International Conference on Acoustics, Speech, & Signal Processing (ICASSP) 2024.

Eunseop Yoon*, Hee Suk Yoon*, Dhananjaya Gowda, SooHwan Eom, Daehyeok Kim, John Harvill, Heting Gao, Mark Hasegawa-Johnson, Chanwoo Kim, Chang D. Yoo, “Mitigating the Exposure Bias in Sentence-Level Grapheme-to-Phoneme (G2P) Transduction”, INTER-SPEECH 2023.

Liming Wang, Mark Hasegawa-Johnson and Chang D. Yoo, “A Theory of Unsupervised Speech Recognition”, Association for Computational Linguistics (ACL) 2023. (Long paper)

Liming Wang, Junrui Ni, Heting Gao, Jialu Li, Kai Chieh Chang, Xulin Fan, Junkai Wu, Mark Hasegawa-Johnson and Chang D. Yoo, “Speak, Decipher and Sign: Toward Unsupervised Speech-to-Sign Language Recognition”, Association for Computational Linguistics (ACL) 2023. (Long paper, Findings)

Eunseop Yoon*, Hee Suk Yoon*, John Harvill, Mark Hasegawa-Johnson and Chang D. Yoo, “Information-Theoretic Adversarial Prompt Tuning for Enhanced Non-Native Speech Recognition”, Association for Computational Linguistics (ACL) 2023, (Short paper, Findings)

Young HoonJung*, Trung Xuan Pham*, Dias Issa, Hee SeungWang, Jae HeeLee, Mingi Chung, Bo-Yeon Lee, Gwangsu Kim, Chang D.Yoo, Keon Jae Lee, “Deep Learning-based Noise Robust Flexible Piezoelectric Acoustic Sensors for Speech Processing”, Nano Energy, 2022.

Liming Wang, Mark Hasegawa, Chang D. Yoo, “Self-supervised Semantic-driven phoneme Discovery for Zero-resource Speech Recognition ” Association for Computational Linguistics (ACL) 2022.

John Harvill, Dias Issa, Mark Hasegawa-Johnson, Chang D. Yoo, “Synthesis of New Words for Improved Dysarthric Speech Recognition on an Expanded Vocabulary”, The International Conference on Acoustics, Speech, & Signal Processing (ICASSP) 2021.

Leda Sari, Mark Hasegawa-Johnson, and Chang D. Yoo, “Counterfactually Fair Automatic Speech Recognition”, IEEE/ACM Transactions on Audio, Speech & Language Processing (ICASSP) 2021.

H. Gao, X. Wang, Chang D. Yoo et al, “Seamless equal accuracy ratio for inclusive CTC speech recognition.” Speech Communication (2021).

Kiran Ramnath, Leda Sari, Mark Hasegawa-Johnson and Chang Yoo ”Worldly Wise (WoW) - Cross-Lingual Knowledge Fusion for Fact-based Visual Spoken-Question Answering”, Annual Conference of the North American Chapter of the Association for Computational Linguistics, 2021.

Young Hoon Jung, Seong Kwang Hong, Hee Seung Wang, Jae Hyun Han, Trung Xuan Pham, Hyunsin Park, Junyeong Kim, Sunghun Kang, Chang D. Yoo, and Keon Jae Lee, ”Flexible Piezoelectric Acoustic Sensors and Machine Learning for Speech Processing”, *Advanced*

Materials, Oct 2019.

Jae Hyun Han, Kang Min Bae, Seong Kwang Hong, Hyunsin Park, Jun-Hyuk Kwak, Hee Seung Wang, Daniel Juhung Joe, Jung Hwan Park, Young Hoon Jung, Shin Hur, Chang D. Yoo and Keon Jae Lee, "Machine Learning-based Self-powered Acoustic Sensor for Speaker Recognition", *Nano Energy*, 53, 658, 2018.

Janghoon Cho and Chang D. Yoo, "Underdetermined Convolutional BSS: Bayes Risk Minimization Based on a Super-Gaussian Posterior Approximation", *IEEE Transactions on Audio, Speech and Language Processing*, vol. 23, no. 5, pp. 828-839, March 2015.

Jinho Choi and Chang D. Yoo, "Underdetermined High-Resolution DOA Estimation: A2pth-Order Source-Signal/Noise Subspace Constrained Optimization", *IEEE Transactions on Signal Processing*, vol. 63, no. 7, pp. 1858-1873, February 2015.

Hyunsin Park, Sungrack Yun, Jongmin Kim, Sanghyuk Park, and Chang D. Yoo, "Phoneme Classification using Constrained Variational Gaussian Process Dynamical System" in Proceedings of *Neural Information Processing Systems*, Lake Tahoe, Nevada, United States, December 2012.

Sungrack Yun and Chang D. Yoo, "Loss-scaled Large Margin Gaussian Mixture Models for Speech Emotion Classification", accepted for publication in *IEEE Transactions on Audio, Speech and Language processing*.

Sungwoong Kim, Sungrack Yun, and Chang D. Yoo, "Large Margin Discriminative Semi-Markov Model for Phonetic Recognition", to appear for publication in *IEEE Transactions on Audio, Speech and Language processing*, September 2011.

Jinho Choi and Chang D. Yoo, "A High Resolution Multiple Source Localization based on Generalized Cumulant Structure (GCS) Matrix," in Proceedings of *Interspeech*, Florence, Italy, August 2011.

Seokhwan Jo and Chang D. Yoo, "Psychoacoustically Constrained and Distortion Minimized Speech Enhancement", *IEEE Transactions on Audio, Speech and Language processing*, vol.18, no.8, pp.2099-2110, November 2010.

Jinho Choi and Chang D. Yoo, "A Maximum a Posteriori Sound Source Localization in Reverberant and Noisy Conditions", in Proceedings of *Interspeech*, Makuhari, Japan, September 2010.

Sungwoong Kim, Sungrack Yun and Chang D. Yoo, "Large margin training of semi-Markov model for phonetic recognition", in Proceedings of *IEEE International Conference on Acoustics, Speech and Signal Processing*, Dallas, USA, March 2010.

Yoonsung Park, Sungrack Yun and Chang D. Yoo, "Parametric emotional singing voice synthesis", in Proceedings of *IEEE International Conference on Acoustics, Speech and Signal Processing*, Dallas, USA, March 2010.

Sanggyun Kim and Chang D. Yoo, "Underdetermined blind source separation based on subspace representation", *IEEE Transactions on Signal Processing*, vol. 57, no. 7, pp.2604-2614, July 2009.

Sungwoong Kim, Sungrack Yun, and Chang D. Yoo, "Margin-Enhanced Maximum Mutual Information Estimation for Hidden Markov Models", in Proceedings of *IEEE International Symposium on Industrial Electronics (ISIE 2009)*, Seoul, Korea, July 2009.

Minho Jin, Jaewook Kim, and Chang D. Yoo, "Humming-Based Human Verification and Identification", in Proceedings of *IEEE International Conference on Acoustics, Speech and Signal Processing*, Taipei, Taiwan, April 2009.

Seokhwan Jo, Chang D. Yoo, "Psychoacoustically Constrained and Distortion Minimized Speech Enhancement Algorithm", in Proceedings of *IEEE International Conference on Acoustics, Speech and Signal Processing*, Taipei, Taiwan, April 2009.

Sungrack Yun and Chang D. Yoo, "Speech Emotion Recognition Via A Max-margin Framework Incorporating A Loss Function Based on The Watson and Tellegen's Emotion Model", in Proceedings of *IEEE International Conference on Acoustics, Speech and Signal Processing*, Taipei, Taiwan, April 2009.

- Sanggyun Kim, Chang D. Yoo and Truong Q. Nguyen, "Alias-free subband adaptive filtering with critical sampling," *IEEE Transactions on Signal Processing*, vol. 56, no. 5, pp.1894-1904, May 2008.
- Minho Jin, Frank K. Soong and Chang D. Yoo, "A syllable Lattice Approach to Speaker Verification," *IEEE Transactions on Audio, Speech and Language processing*, vol. 15, no. 8, pp. 2476-2484, Nov. 2007.
- Sungrack Yun and Chang D. Yoo, "Automatic Floating-point to Fixed-point Conversion for Speech Recognition in Fixed-point DSP," in Proceedings of *The 22nd International Technical Conference on Circuits/Systems, Computers and Communications*, Busan, Korea, vol. 2, pp. 837-838, July 2007.
- Sungrack Yun and Chang D. Yoo, "The p-Norm of Likelihood Difference Estimation Algorithm for Hidden Markov Models," in Proceedings of *The 22nd International Technical Conference on Circuits/Systems, Computers and Communications*, Busan, Korea, vol. 3, pp. 1215-1216, July 2007.
- Seokhwan Jo and Chang D. Yoo, "Speech Enhancement Based on the Decomposition of Speech into Deterministic and Stochastic Components and Psychoacoustic Model," in Proceedings of *IEEE International Conference on Acoustics, Speech and Signal Processing*, Honolulu, Hawaii, USA, vol. 4, pp. 897-900, April 2007.
- SangGyun Kim and Chang D. Yoo, "Underdetermined Blind Source Separation Based on Generalized Gaussian Distribution," in Proceedings of *IEEE International Workshop on Machine Learning for Signal Processing*, Maynooth, Ireland, pp. 103-108, September 2006.
- Minho Jin, Frank K. Soong and Chang D. Yoo, "Syllable Lattice Based Re-Scoring For Speaker Verification," in Proceedings of *IEEE International Conference on Acoustics, Speech and Signal Processing*, Toulouse, France, vol. 1, pp. 921-924, May 2006.
- SangGyun Kim and Chang D. Yoo, "Blind Separation of Speech and Sub-Gaussian Signals in Underdetermined Case," in Proceedings of *International Conference on Spoken Language Processing*, Jeju, Korea, pp. 2861-2864, October 2004.
- Minho Jin, Gyucheol Jang, Sungrack Yun, Chang D. Yoo, "Hybrid Utterance Verification based on N-best Models and Model derived from Kullback-Leibler Divergence," in Proceedings of *International Conference on Spoken Language Processing, Jeju, Korea*, pp. 1529-1532, October 2004.
- SangGyun Kim and Chang D. Yoo, "Underdetermined Independent Component Analysis by Data Generation," in Proceedings of *Independent Component Analysis and Blind Signal Separation*, Granada, Spain, pp. 445-452, September 2004.
- S.G. Kim and C.D. Yoo, "Highly Selective M-Channel IIR Cosine-Modulated Filter Banks," *Electronics Letters*, Vol. 39, No. 20, pp. 1478-1479, October 2003.
- Gyucheol Jang, Minho Jin, and Chang D. Yoo, "Speaker Adaptation Based on Confidence-Weighted Training," in Proceedings of *Eurospeech, Geneva, Switzerland*, pp. 1617-1620, September 2003.
- Seongho Seo, Dalwon Jang, Sunil Lee, and Chang D. Yoo, "A Novel Transcoding Algorithm for SMV and G.723.1 Speech Coders via Direct Parameter Transformation," in Proceedings of *Eurospeech, Geneva, Switzerland*, pp. 2861-2864, September 2003.
- Dalwon Jang, Seongho Seo, Sunil Lee, and Chang D. Yoo, "A Novel Rate Selection Algorithm for Transcoding CELP-type Codec and SMV," in Proceedings of *Eurospeech, Geneva, Switzerland*, pp. 2865-2868, September 2003.
- SangGyun Kim, Jong Uk Kim, and Chang D. Yoo, "Accuracy Improved Double-Talk Detector Based on State-Transition Diagram," in Proceedings of *Eurospeech, Geneva, Switzerland*, pp. 1421-1424, September 2003.
- Jong Uk Kim, SangGyun Kim, and Chang D. Yoo, "A Robust and Sensitive Word Boundary Decision Algorithm," in Proceedings of *Eurospeech, Geneva, Switzerland*, pp. 2857-2860, September 2003.
- SangGyun Kim and Chang D. Yoo, "Acoustic Echo Cancellation with Double-talk Detector

in Subbands,” in Proceedings of *Internoise*, Jeju, Korea, pp. 2631-2638, August 2003.

Jong Kwan Lee and Chang D. Yoo, ”Wavelet Speech Enhancement Based on Voiced/Unvoiced Decision,” in Proceedings of *Internoise*, Jeju, Korea, pp. 4149-4156, August 2003.

Jong Uk Kim and Chang D. Yoo, ”Psychoacoustically Motivated Subspace Speech Enhancement,” in Proceedings of *Internoise*, Jeju, Korea, pp. 4157-4164, August 2003.

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