

Chang D. Yoo

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Korea Advanced Institute of Science and Technology
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Professional Interests Education

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

Massachusetts Institute of Technology	Cambridge, MA
Ph.D. degree in Electrical Engineering	September 1996
Cornell University	Ithaca, NY
M.S. degree in Electrical Engineering	August 1988
California Institute of Technology	Pasadena, CA
B.S. degree in Engineering and Applied Science	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>	2013—2015
Korea Advanced Institute of Science and Technology	Daejeon, Korea
<i>Dean of Special Projects and Institutional Relations</i>	2011—2013
Massachusetts Institute of Technology	Cambridge, MA
<i>Visiting Scholar</i>	March 2005—March 2006
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), *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: IEEE MLSP 2009-2011, IS&T/SPIE Electronic Imaging 2010-2011, ICSLP (Interspeech) 2004, ICONIP 2000, ACCV 2012, ICANN 2011
Tutorial Presenter: ICSLP, IEEE ROMAN 2007

Awards and Honorary/ Professional Societies

Recipient of POSCO Scholarship (1986-1996)
Member of Tau Beta Pi (1984), Sigma Xi (1994)
SPIE'2013 Program Committee Member(2012), IEEE Senior Member (2011), ISCA Member (2002)
Best Lecture Award (2009, awarded by Dept. of EE, KAIST)
Achievement Award (2011, 2013, The Institute of Electronics and Information Engineers)

Research Grants

Development for an Android Malware Detection Algorithm based on Deep Learning
Samsung Electronics 2015/07/10-

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

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

Face detection device and method using region-based feature Patent No. KR 0107452 (2013-06-05)

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 Therefor 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 1094896 (2011-12-09)

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

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

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

Method for Spectral Analysis of Polyphonic Audio by Using Variable Length Window Patent No. KR 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 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 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

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)
BSAC arithmetic decoding method based on plural probability model. Appl.No. KR 10-2006-0117773 , (Pending)

Publications

Research Areas

Speech

Music/Audio

Image

Video

Speech publications

Janghoon Cho and Chang D. Yoo, "Underdetermined Convolutional BSS: Bayes Risk Minimization Based on a Mixture of 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: A 2nd-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", *IEEE Transactions on Audio, Speech and Language Processing*, vol. 20, no. 2, pp. 585-598, February, 2012.

Janghoon Cho, Jinho Choi and Chang D. Yoo, "Underdetermined Convolutional BSS based on a Novel Mixing Matrix Estimation and MMSE based Source Estimation," in Proceedings of *IEEE International Workshop on Machine Learning for Signal Processing*, Beijing, China, September 2011.

Sungwoong Kim, Sungrack Yun, and Chang D. Yoo , "Large Margin Discriminative Semi-Markov Model for Phonetic Recognition", *IEEE Transactions on Audio, Speech and Language Processing*, vol. 19, no. 7, pp. 1999-2012, September 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 Chand 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.

Sunil Lee, Seongho Seo, Dalwon Jang and Chang D. Yoo, ”A Novel Transcoding Algorithm for AMR and EVRC Speech Coders via Direct Parameter Transformation,” in Proceedings of *IEEE International Conference on Acoustics, Speech and Signal Processing*, Hong Kong, China, vol. 2, pp. 177-180, April 2003.

Jong Uk Kim, Sang G. Kim and Chang D. Yoo, ”The Incorporation of Masking Threshold to Subspace Speech Enhancement,” in Proceedings of *IEEE International Conference on Acoustics, Speech and Signal Processing*, Hong Kong, China, vol. 1, pp. 76-79, April 2003.

Gyuchoel Jang, Sooyoung Woo, Minho Jin and Chang D. Yoo, ”Improvements in speaker adaptation using weighted training,” in Proceedings of *IEEE International Conference on Acoustics, Speech and Signal Processing*, Hong Kong, China, vol. 1, pp. 548-551, April 2003.

Sukhyun Yoon and Chang D. Yoo, ”Speech Enhancement Based on Speech/Noise-Dominant Decision,” *IEICE Transactions on Information and Systems*, vol. E85-D, no. 4, pp. 744-750, April 2002.

Sang G. Kim and Chang D. Yoo, ”Acoustic echo cancellation based on M-channel IIR cosine-modulated filter bank,” in Proceedings of *International Conference on Spoken Language Processing, Denver, Colorado, USA*, vol. 2, pp. 789-792, September 2002.

Jong Uk Kim and Chang D. Yoo, ”Subspace Speech Enhancement Using Subband Whitening Filter,” in Proceedings of *International Conference on Spoken Language Processing*, Denver, Colorado, USA, vol. 2, pp. 1085-1088, September 2002.

Jin S. Seo and Chang D. Yoo, ”On the design of template in the autocorrelation domain,” in Proceedings of *IS&T/SPIE Electronic Imaging*, vol. 4675, pp. 305-312, San Jose, California, USA, January 2002.

SangGyun Kim and ChangDong Yoo, ”Oversampled adaptive subband structure,” in Proceedings of *International Conference on Speech Processing*, Daejeon, Korea, vol. 2, pp. 907-910, August 2001.

Gyuchoel Jang, Sooyoung Woo and Chand D. Yoo, ”Voice segmentation algorithm,” in Proceedings of *International Conference on Speech Processing*, Daejeon, Korea, vol. 2, pp. 593-596, August 2001.

Sukhyun Yoon and Chang D. Yoo, ”Novel speech enhancement based on speech/noise-dominant decision,” in Proceedings of *International Conference on Speech Processing*, Daejeon, Korea, vol. 2, pp. 911-914, August 2001.

Wonil Lee, Sunil Lee and Changdong Yoo, ”Improvement of tandemless transcoding from AMR to EVRC,” in Proceedings of *International Conference on Speech Processing*, Daejeon, Korea, vol. 1, pp. 334-339, August 2001.

Sukhyun Yoon and Chang D. Yoo, "Speech/Noise dominant decision for speech enhancement," in Proceedings of *Eurospeech*, Aalborg, Denmark, vol. 3, pp. 1941-1944, September 2001.

Jin S. Seo and Chang D. Yoo, "Comparison of acoustic echo cancellers based on neural network," in Proceedings of *International Conference on Neural Information Processing*, Daejeon, Korea, vol. 2, pp. 1363-1366, November 2000.

Chang D. Yoo, "Utilizing Interband Acoustical Information for Modeling Stationary Time-Frequency Regions of Noisy Speech," in Proceedings of *IEEE International Conference on Acoustics, Speech and Signal Processing*, Phoenix, Arizona, USA, vol. 2, pp. 809-812, March 1999.

Chang D. Yoo, "Selective All-Pole Modeling of Degraded Speech using M-Band Decomposition," in Proceedings of *IEEE International Conference on Acoustics, Speech and Signal Processing*, Atlanta, Georgia, USA, vol. 2, pp. 641-644, May 1996.

Chang D. Yoo and Jae S. Lim, "Speech Enhancement Based on the Generalized Dual Excitation Model with Adaptive Analysis Window," in Proceedings of *IEEE International Conference on Acoustics, Speech and Signal Processing*, Detroit, Michigan, USA, vol. 1, pp. 832-835, May 1995.

John Hardwick, Chang D. Yoo and Jae S. Lim, "Speech Enhancement using the Dual Excitation Speech Model," in Proceedings of *IEEE International Conference on Acoustics, Speech and Signal Processing*, Minneapolis, Minnesota, USA, vol. 2, pp. 367-370, May 1993.

Research Areas

Speech

Music/Audio

Image

Video

Music/Audio publications

Janghoon Cho, Chang D. Yoo, "A Maximum Likelihood Approach For Underdetermined TDOA Estimation" in Proceedings of *International Conference on Acoustics, Speech, and Signal Processing*, Vancouver, Canada, May 2013.

Sihyun Joo, Sanghun Park, Seokhwan Jo and Chang D. Yoo, "Melody Extraction based on Harmonic Coded Structure," in Proceedings of *ISMIR 2011*, Miami, USA, October 2011.

Juwan Lee, Sanghun Park, Seokhwan Jo and Chang D. Yoo, "Music Plagiarism Detection System," in Proceedings of *The 26th International Technical Conference on Circuits/Systems, Computers and Communications*, Gyeongju, Korea, June 2011.

Seokhwan Jo, Chang D. Yoo and Arnaud Doucet, "Melody Tracking based on Sequential Bayesian Model," *IEEE Journal of Selected Topics in Signal Processing*, vol. 5, no. 6, pp. 1216-1227, October 2011.

Seokhwan Jo, Sihyun Joo and Chang D. Yoo, "Melody pitch estimation based on range estimation and candidate extraction using harmonic structure model", in Proceedings of *Interspeech*, Makuhari, Japan, September 2010.

Seokhwan Jo and Chang D. Yoo, "Melody extraction from polyphonic audio based on particle filter", in Proceedings of *ISMIR 2010*, Utrecht, Netherlands, August 2010.

Dalwon Jang, Chang D. Yoo, Sunil Lee, Sungwoong Kim, and Ton Kalker, "Pairwise Boosted Audio Fingerprint" *IEEE Transactions on Information Forensics and Security*, vol.4, no.4, pp.995-1004, December 2009.

Dalwon Jang and Chang D. Yoo, "Music information retrieval using novel features and a weighted voting method", in Proceedings of *IEEE International Symposium on Industrial Electronics (ISIE 2009)*, Seoul, Korea, July 2009.

Dalwon Jang, Minho Jin, and Chang D. Yoo, "Music Genre Classification using Novel Features and a Weighted Voting Method," in Proceedings of *IEEE International Conference on Multimedia and Expo*, Hannover, Germany, June 2008.

Minho Jin and Chang D. Yoo, "Temporal Dynamics for Spectral Sub-band Centroid Audio Fingerprints," in Proceedings of *IEEE International Conference on Multimedia/Expo, Beijing, China*, pp. 180-183, July 2007.

Sungwoong Kim and Chang D. Yoo, "Boosted Binary Audio Fingerprint Based on Spectral

Subband Moments,” in Proceedings of *IEEE International Conference on Acoustics, Speech and Signal Processing*, Honolulu, Hawaii, USA, vol. 1, pp. 241-244, April 2007.

JunSeong Kim, SangGyun Kim and Chang D. Yoo, “A Novel Adaptive Crosstalk Cancellation Using Psychoacoustic Model for 3D Audio,” in Proceedings of *IEEE International Conference on Acoustics, Speech and Signal Processing*, Honolulu, Hawaii, USA, vol. 1, pp. 185-188, April 2007.

Jin S. Seo, Minho Jin, Sunil Lee, Dalwon Jang, Seungjae Lee, and Chang D. Yoo, “Audio fingerprinting based on normalized spectral subband moments,” *IEEE Signal Processing Letters*, vol. 13, no. 4, pp. 209-212, April 2006.

Dalwon Jang, Seungjae Lee, Jun Seok Lee, Minho Jin, Jin S. Seo, Sunil Lee and Chang D. Yoo, “Automatic Commercial Monitoring for TV Broadcasting Using Audio Fingerprinting,” in Proceedings of *The 29th Audio Engineering Society Conference, Seoul, Korea*, pp. 38-43, September 2006.

Jin S. Seo, Minho Jin, Sunil Lee, Dalwon Jang, Seungjae Lee and Chang D. Yoo, “Audio Fingerprinting Based on Normalized Spectral Subband Centroids,” in Proceedings of *IEEE International Conference on Acoustics, Speech and Signal Processing*, Philadelphia, Pennsylvania, USA, vol. 3, pp. 213-216, March 2005.

Research Areas

Speech

Music/Audio

Image

Video

Image publications

Haeyong Kang, Chang D. Yoo, and Yongcheon Na, “Maximum Margin Learning of t-SPNs for Cell Classification with Filtered Input”, *IEEE Journal of Selected Topics in Signal Processing*, accepted for publication.

Sanghyuk Park and Chang D. Yoo, “Dense Image Registration and Deformable Surface Reconstruction in Presence of Occlusions and Minimal texture”, in Proceedings of International Conference on Computer Vision, Santiago, Chile, 2015.

Changhoon Lee and Chang D. Yoo, “Segment-wise Online Learning based on Greedy Algorithm For Real-time Multi-target Tracking”, in Proceedings of International Conference on Image Processing, Quebec, Canada, 2015.

Sunghun Kang, Donghoon Lee, and Chang D. Yoo, “Face attribute classification using attribute-aware correlation map and gated convolutional neural networks”, in Proceedings of International Conference on Image Processing, Quebec, Canada, 2015.

Donghoon Lee, Hyunsin Park, and Chang D. Yoo, “Face Alignment Using Cascade Gaussian Process Regression Trees”, in Proceedings of International Conference on Computer Vision and Pattern Recognition, Boston, USA, 2015.

Chulhee Yun, Donghoon Lee, and Chang D. Yoo, “Face Detection using Local Hybrid Patterns, “Face Detection using Local Hybrid Patterns,” in Proceedings of *International Conference on Acoustics, Speech, and Signal Processing*, Brisbane, Australia, 2015.

Donghoon Lee, Junyoung Chung, Chang D. Yoo, “Joint Estimation of Pose and Face Landmark”, in Proceedings of Asian Conference on Computer Vision,” in Proceedings of *Asian Conference on Computer Vision*, Singapore, 2014.

Jungyu Kang and Chang D. Yoo, “Learning of a Discriminative Dictionary based on Non-negative Mutual Incoherency”, accepted for publication in *IEEE Letters on Signal Processing*, 2014.

Sungwoong Kim, Chang D. Yoo, Sebastian Nowozin, and Pushmeet Kohli, “Image Segmentation Using Higher-Order Correlation Clustering”, *IEEE Transactions on Pattern Analysis and Machine Intelligence*, vol. 36, no. 9, pp. 1761-1774, September 2014.

Tae-Ho Kim, Changhoon Lee, Chang D. Yoo, ‘A hierarchical structured dictionary algorithm for classification,’ in Proceedings of *International Conference on Image Processing*, Paris, France, 2014.

Jaesik Yoon, Jin Ho Choi and Chang D. Yoo, ‘A hierarchical structured dictionary algorithm for classification,’ in Proceedings of *International Conference on Image Processing*, Paris,

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