

# Chi-Chun Lee (Jeremy)

## National Tsing Hua University

Department of Electrical Engineering

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### Professional Interests

Speech and Language Processing, Affective Computing, Behavioral Signal Processing

### Education

University of Southern California (USC), Signal Interpretation Analysis Laboratory (SAIL)

#### **Ph.D. in Electrical Engineering**

(Dec. 2012)

Thesis Advisor: Professor Shrikanth S. Narayanan

*BSP: Computational Approaches for Modeling and Quantifying Interaction Dynamics in Dyadic Human Interactions*

University of Southern California (USC), California, USA

#### **B.S. in Electrical Engineering**, emphasis in digital signal processing

(May 2007)

Minor in **Business Administration**

(May 2007)

### Professional Experiences

#### **Aug. 2018 – Present: Associate Professor**

National Tsing Hua University, Electrical Engineering, Hsinchu, Taiwan

#### **Feb. 2014 – Jul. 2018: Assistant Professor**

National Tsing Hua University, Electrical Engineering, Hsinchu, Taiwan

#### **Feb. 2013 – Dec. 2013: Data Scientist**

id:a Lab, ID Analytics Inc., San Deigo, USA

#### **Sept. 2007 – Dec. 2012: Graduate Research Assistant**

Signal Analysis and Interpretation Laboratory (SAIL Lab), USC, Los Angeles, USA

#### **Sept. 2006 – May 2007: Undergraduate Research Assistant**

Information Laboratory (INFO Lab), USC, Los Angeles, USA

#### **June 2006 – Sept. 2006: NSF Undergraduate Summer Research Program**

Undergraduate Summer Research at Institute for Pure and Applied Mathematics, UCLA, Los Angeles, USA

### Awards/Honors

**Most Cited Journal published in 2014 up to 2016** (Journal of Speech Communication)

**Magna Cum Laude** (2007)

**Annenberg Fellowship**, University of Southern California (2007-2009)

**Undergraduate Dean's List** (2003 – 2007)

**2018 Interspeech Best Paper Award Candidate (Top 12)**

**2018 IEEE EMBC Best Paper (Top 15)**

**2010 Interspeech Best Paper Award**

**2009 Interspeech Emotion Challenge First Place Winner** (Classifier Sub-Challenge)

**2008 Interspeech Student Best Paper Award Candidate**

**2017 ROCLING Student Best Paper Award Candidate**

**Honors Societies:** Phi Kappa Phi, Tau Beta Pi, Eta Kappa Nu

### Publications

### **Book**

- [1] **Chi-Chun Lee\***, "Modeling Human Behaviors in Psychology Using Engineering Methods", River Publishers' Series in Information Science and Technology, May 2014, ISBN: 9788793102606

### **Book Chapter**

- [1] **Chi-Chun Lee\***, Jangwon Kim, Angeliki Metallinou, Carlos Busso, Sungbok Lee, and Shrikanth S. Narayanan, "Speech in Affective Computing ", in: R.A. Calvo, S.K. D'Mello, J. Gratch and A. Kappas (Eds), Handbook of Affective Computing, Oxford University Press, 2014, ISBN: 9780199942237

### **Journal**

- [1] Wei-Cheng Lin, **Chi-Chun Lee\***, "Computational Analyses of Thin-sliced Behavior Segments in Session-level Affect Perception" IEEE Transactions on Affective Computing (2018) DOI: 10.1109/TAFFC.2018.2816654
- [2] Shan-Wen Hsiao, Hung-Ching Sun, Ming-Chuan Hsieh, Ming-Hsueh Tsai, Yu Tsao, **Chi-Chun Lee\***, "Toward Automating Oral Presentation Scoring during Principal Certification Program using Audio-video Low-level Behavior Profiles", in IEEE Transactions on Affective Computing (2017) DOI: 10.1109/TAFFC.2017.2749569
- [3] Tassadaq Hussain, Sabato Marco Siniscalchi, **Chi-Chun Lee**, Syu-Siang Wang, Yu Tsao and Wen-Hung Liao, "Experimental Study on Extreme Learning Machine Applications for Speech Enhancement", in IEEE Access (2017) DOI: 10.1109/ACCESS.2017.276667
- [4] Daniel Bone, **Chi-Chun Lee**, Theodora Chaspari, James Gibson, Shrikanth Narayanan, "Signal Processing and Machine Learning for Mental Health Research and Clinical Applications", in IEEE Signal Processing Magazine 34(5), 196 – 195, 2017
- [5] Stephenson J. Beck, Annika L. Meinecke, Yoichi Matsuyama, **Chi-Chun Lee**, "Initiating and Maintaining Collaborations and Facilitating Understanding in Interdisciplinary Group Research", in Small Group Research 48(5), 532-543, 2017
- [6] Daniel Bone, Matthew Goodwin, Matthew Black, **Chi-Chun Lee**, Kartik Audhkhasi, and Shrikanth Narayanan, "Applying Machine Learning to Facilitate Autism Diagnostics: Pitfalls and Promises" in: Journal of autism and developmental disorders 45(5) 1121-1136, 2015
- [7] Angeliki Metallinou, Zhaojun Yang, **Chi-Chun Lee**, Carlos Busso, Sharon Carnicke, and Shrikanth Narayanan, "The USC CreativeIT Database of Multimodal Dyadic Interactions: From Speech and Full Body Motion Capture to Continuous Emotional Annotations" in: Journal of Language Resources and Evaluation 50(3) 497-512, 2015
- [8] Daniel Bone, **Chi-Chun Lee**, and Shrikanth S. Narayanan, "Robust Unsupervised Arousal Rating: A rule-based framework with knowledge-inspired vocal features", in IEEE Transaction of Affective Computing, 5(2): 201-213, May 2014
- [9] Daniel Bone, **Chi-Chun Lee**, Matthew Black, Marian Williams, Sungbok Lee, Pat Levitt, and Shrikanth S. Narayanan, "The Psychologist as an Interlocutor in ASD Assessment: Insights from a Study of Spontaneous Prosody", in: Journal of Speech, Language, and Hearing Research, 57(1):1162-1177, August 2014, doi: 10.1044/2014\_JSLHR-S-13-0062
- [10] **Chi-Chun Lee**, Athanasios Katsamanis, Matthew Black, Brian Baucom, Andrew Christensen, Panayiotis G. Georgiou, and Shrikanth S. Narayanan, "Compute Vocal Entrainment: A Signal-Derived PCA-based Quantification Scheme with Application for Affect Analysis in Married Couple Interactions ", in: Journal of Computer Speech and Language, 28(2): 518-539 doi:10.1016/j.csl.2012.06.006
- [11] Matthew Black, Athanasios Katsamanis, Brian Baucom, **Chi-Chun Lee**, Adam Lammert, Andrew Christensen, Panayiotis G. Georgiou, and Shrikanth S. Narayanan, "Toward Automating a Human Behavioral Coding System for Married

*Couples' Interactions using Speech Acoustic Features*", in: Journal of Speech Communication Speech Communication, 55:1 (1-21)

- [12] **Chi-Chun Lee**, Emily Mower, Carlos Busso, Sungbok Lee, and Shrikanth S. Narayanan, "*Emotion Recognition Using a Hierarchical Binary Decision Tree Approach*", in: Journal of Speech Communication, 53:9-10(1162-1171)
- [13] Carlos Busso, Murtaza Bulut, **Chi-Chun Lee**, Abe Kazemzadeh, Emily Mower, Samuel Kim, Jeannette Chang, Sungbok Lee, and Shrikanth S. Narayanan, "*IEMOCAP: Interactive emotional dyadic motion capture database (2008)*", in: Journal of Language Resources and Evaluation, 42:4 (335-359)

### **Conference Paper**

- [1] Chih-Chuan Lu, Jhen-Lin Li, and **Chi-Chun Lee\***, "Learning an Arousal-Valence Speech Front-End Network using Media Data In-the-Wild for Emotion Recognition", in Proceedings of ACM on the Audio/Visual Emotion Challenge and Workshop (AVEC), 2018
- [2] Yi-Ying Kao, Hsiang-Ping Hsu, Chien-Feng Liao, Yu Tsao, Hao-Chun Yang, Jeng-Lin Li, **Chi-Chun Lee**, Hung-Shin Lee and Hsin-Min Wang, "Automatic Detection of Speech under Cold using Discriminative Autoencoder and Strength Modeling with Multiple Sub-dictionary Generation", in Proceedings of International Workshop on Acoustic Signal Enhancement (IWAENC), 2018
- [3] Gao-Yi Chao, Chun-Min Chang, Jeng-Lin Li, Ya-Tse Wu, **Chi-Chun Lee\***, "Generating fMRI-Enriched Acoustic Vectors using a Cross-Modality Adversarial Network for Emotion Recognition" in Proceedings of ACM International Conference on Multimodal Interaction (ICMI), 2018
- [4] Yun-Shao Lin, **Chi-Chun Lee\***, "Using Interlocutor-Modulated Attention BLSTM to Predict Personality Traits in Small Group Interactions", in Proceedings of ACM International Conference on Multimodal Interaction (ICMI), 2018
- [5] Yun-Shao Lin, Susan Shur-Fen Gau and **Chi-Chun Lee\***, "An Interlocutor-Modulated Attentional LSTM for Differentiating between Subgroups of Autism Spectrum Disorder ", in Proceedings of the International Speech Communication Association (Interspeech), 2018 **[Best Student Paper Finalist]**
- [6] Jeng-Lin Li, Yi-Ming Weng, Chip-Jin Ng and **Chi-Chun Lee\***, "Learning Conditional Acoustic Latent Representation with Gender and Age Attributes for Automatic Pain Level Recognition", in Proceedings of the International Speech Communication Association (Interspeech), 2018
- [7] Jeng-Lin Li and **Chi-Chun Lee\***, "Encoding Individual Acoustic Features using Dyad-Augmented Deep Variational Representations for Dialog-level Emotion Recognition", in Proceedings of the International Speech Communication Association (Interspeech), 2018
- [8] Fu-Sheng Tsai, Hao-Chun Yang, Wei-Wen Chang and **Chi-Chun Lee\***, "Automatic Assessment of Individual Culture Attribute of Power Distance using a Social Context-Enhanced Prosodic Network Representation ", in Proceedings of the International Speech Communication Association (Interspeech), 2018
- [9] Bo-Hao Su, Sung-Lin Yeh, Ming-Ya Ko, Huan-Yu Chen, Shun-Chang Zhong, Jeng-Lin Li and Chi-Chun Lee, "Self-Assessed Affect Recognition using Fusion of Attentional BLSTM and Static Acoustic Features ", in Proceedings of the International Speech Communication Association (Interspeech), 2018
- [10] Chen-Ying Hung, Ching-Heng Lin, Chi-Chun Lee\*, "Improving Young Stroke Prediction by Learning with Active Data Augmenter in a Large-Scale Electronic Medical Claims Database" in Proceeding of the IEEE Engineering in Medicine and Biology Society (EMBC), 2018 **[Best Student Paper Finalist]**

- [11]Wei-Hao Chang, Jeng-Lin Li, Yun-Shao Lin, **Chi-Chun Lee\***, "A Genre-Affect Relationship Network with Task-Specific Uncertainty Weighting for Recognizing Induced Emotion in Music" in Proceedings of the IEEE International Conference on Multimedia & Expo (ICME), 2018 (Oral)
- [12]Yu-Shuo Liu, Chin-Po Chen, Susan Shur-Fen Gau, **Chi-Chun Lee\***, "Learning Lexical Coherence Representation using LSTM forget gate for Children with Autism Spectrum Disorder during Story-telling" in Proceedings of the International Conference on Acoustics, Speech, and Signal Processing (ICASSP), 2018
- [13]Wan-Ting Hsieh, Hao-Chun Yang, Ya-Tse Wu, Fu-Sheng Tsai, Li-Wei Kuo, **Chi-Chun Lee\***, "Integrating Perceivers Neural-Perceptual Responses using a Deep Voting Fusion Network for Automatic Vocal Emotion Decoding" in Proceedings of the International Conference on Acoustics, Speech, and Signal Processing (ICASSP), 2018
- [14]Hao-Chun Yang, Fu-Sheng Tsai, Yi-Ming Weng, Chip-Jin Ng, Chi-Chun Lee\*, "A Triplet-loss Embedded Deep Regressor Network for Estimating Blood Pressure Changes using Prosodic Features" in Proceedings of the International Conference on Acoustics, Speech, and Signal Processing (ICASSP), 2018
- [15]Chun-Min Chang, Bo-Hao Su, Shih-Chen Lin, Jeng-Lin Li, **Chi-Chun Lee\***, "A Bootstrapped Multi-View Weighted Kernel Fusion Framework for Cross-Corpus Integration of Multimodal Emotion Recognition" in Proceedings of ACII, pp. 377-382, 2017
- [16]Huang-Cheng Chou, Wei-Cheng Lin, Lien-Chiang Chang, Chyi-Chang Li, Hsi-Pin Ma, **Chi-Chun Lee\***, "NNIME: The NTHU-NTUA Chinese Interactive Multimodal Emotion Corpus" in Proceedings of ACII, pp. 292-298, 2017
- [17]Fu-Sheng Tsai, Yi-Ming Weng, Chip-Jin Ng, **Chi-Chun Lee\***, "Embedding Stacked Bottleneck Vocal Features within an LSTM Architecture for Automatic Pain Level Classification during Emergency Triage" in Proceedings of ACII, pp. 313-318, 2017
- [18]Chen-Ying Hung, Wei-Chen Chen, Po-Tsun Lai, Ching-Heng Lin, **Chi-Chun Lee\***, "*Comparing Deep Neural Network and Other Machine Learning Algorithms for Stroke Prediction in a Large-Scale Population-Based Electronic Medical Claims Database*" in IEEE Engineering in Medicine and Biology Society (EMBC), pp. 3110-3113, 2017
- [19]Ya-Tse Wu, Hsuan-Yu Chen, Yu-Hsien Liao, Li-Wei Kuo, **Chi-Chun Lee\***, "*Modeling Perceivers Neural-Responses using Lobe-dependent Convolutional Neural Network to Improve Speech Emotion Recognition*" in Proceedings of the International Speech Communication Association (Interspeech), pp. 3261-3265, 2017
- [20]Yun-Shao Lin, **Chi-Chun Lee\***, "*Deriving Dyad-Level Interaction Representation using Interlocutors Structural and Expressive Multimodal Behavior Features*" in Proceedings of the International Speech Communication Association (Interspeech), pp. 2366-2370, 2017
- [21]Chin-Po Chen, Xian-Hong Tseng, Susan Shur-Fen Gau, **Chi-Chun Lee\***, "*Computing Multimodal Dyadic Behaviors during Spontaneous Diagnosis Interviews toward Automatic Categorization of Autism Spectrum Disorder*" in Proceedings of the International Speech Communication Association (Interspeech), pp. 2361-2365, 2017
- [22]Chun-Min Chang, **Chi-Chun Lee\***, "*Fusion of Multiple Emotion Perspectives: Improving Affect Recognition Through Integrating Cross-Lingual Emotion Information*" in Proceedings of the International Conference on Acoustics, Speech, and Signal Processing (ICASSP), pp.5820-5824, 2017
- [23]Hung-Shin Lee, Yu Tsao, **Chi-Chun Lee**, Hsin-Min Wang, Wei-Cheng Lin, Wei-Chen Chen, Shan-Wen Hsiao, Shyh-Kang Jeng, "*Minimization of Regression and Ranking Loss with Shallow Neural Network on Automatic Sincerity Evaluation*" in Proceedings of the International Speech Communication Association (Interspeech), pp. 2031-2035, 2016

- [24]Fu-Sheng Tsai, Ya-Ling Hsu, Wei-Chen Chen, Yi-Ming Weng, Chip-Jin Ng, **Chi-Chun Lee\***, "Toward Development and Evaluation of Pain Level-Rating Scale for Emergency Triage based on Vocal Characteristics and Facial Expressions" in Proceedings of the International Speech Communication Association (Interspeech), pp. 92-96, 2016
- [25]Wen-Yu Huang, Shan-Wen Hsiao, Hung-Ching Sun, Ming-Chuan Hsieh, Ming-Hsueh Tsai, **Chi-Chun Lee\***, "Enhancement of Automatic Oral Presentation Assessment System using Latent N-Grams Word Representation and Part-of-Speech Information " in Proceedings of the International Speech Communication Association (Interspeech), pp. 1432-1436, 2016
- [26]Wei-Cheng Lin, **Chi-Chun Lee\***, "A Thin-slice Perception of Emotion? An Information Theoretic-based Framework to Identify Locally Emotion-rich Behavior Segments for Global Affect Recognition" in Proceedings of the International Conference on Acoustics, Speech, and Signal Processing (ICASSP), pp. 5790-5794, 2016
- [27]Hsuan-Yu Chen, Yu-Hsien Liao, Heng-Tai Jan, Li-Wei Kuo, **Chi-Chun Lee\***, "A Gaussian Mixture Regression Approach toward Modeling the Affective Dynamics between Acoustically-derived Vocal Arousal Score (VC-AS) and Internal Brain fMRI BOLD Signal Response" in Proceedings of the International Conference on Acoustics, Speech, and Signal Processing (ICASSP), pp. 5775-5779, 2016
- [28]Shan-Wen Hsiao, Hung-Ching Sun, Ming-Chuan Hsieh, Ming-Hsueh Tsai, Hsin-Chih Lin, **Chi-Chun Lee\***, "A Multimodal Approach for Automatic Assessment of School Principals' Oral Presentation During Pre-service Training Program" in Proceedings of the International Speech Communication Association (Interspeech), 2015
- [29]**Chi-Chun Lee\***, Daniel Bone, Shrikanth S. Narayanan, "An Analysis of the Relationship between Signal-derived Vocal Arousal Score and Human Emotion Production and Perception" in Proceedings of the International Speech Communication Association (Interspeech), 2015
- [30]Wei-Chen Chen, Po-Tsun Lai, Yu Tsao, **Chi-Chun Lee\***, "Multimodal Arousal Rating using Unsupervised Fusion Technique", in Proceedings of the International Conference on Acoustics, Speech, and Signal Processing (ICASSP), 2015
- [31]How Jing, Ting-Yao Hu, Hung-Shin Lee, Wei-Chen Chen, **Chi-Chun Lee**, Yu Tsao and Hsin-Min Wang, "Ensemble of Machine Learning Algorithms for Cognitive and Physical Speaker Load Detection," in Proceedings of Conference of the International Speech Communication Association (Interspeech), 2014
- [32]Daniel Bone, **Chi-Chun Lee**, Alexandros Potamianos, and Shrikanth Narayanan, "An Investigation of Vocal Arousal Dynamics in Child-Psychologist Interactions using Synchrony Measures and a Conversation-based Model", in Proceedings of Conference of the International Speech Communication Association (Interspeech), 2014.
- [33]Bo Xiao, Panayiotis G. Georgiou, **Chi-Chun Lee**, Brian Baucom Shrikanth Narayanan, "Head Motion Mimicry and its Correlation to Affectivity in Dyadic Interactions", in: Proceedings of IEEE International Conference on Multimedia and Expo (ICME), 2013
- [34]Daniel Bone, **Chi-Chun Lee**, Vikram Ramanarayanan, Shrikanth Narayanan, Renske S. Hoedemaker, Peter C. Gordon "Modeling Eye-Voice Coordination in Rapid Automatized Naming: Smooth Patterns of Fast Performance", in: Proceedings of Conference of the International Speech Communication Association (Interspeech), 2013
- [35]Daniel Bone, **Chi-Chun Lee**, Theodora Chaspari, Matthew P. Black, Marian Williams, Sungbok Lee, Pat Levitt and Shrikanth S. Narayanan, Acoustic-Prosodic, Turn-taking, and Language Cues in Child-Psychologist Interactions for Varying Social Demand, in: Proceedings of Conference of International Speech Communication Association (Interspeech), 2013
- [36]Theodora Chaspari, Daniel Bone, James Gibson, **Chi-Chun Lee**, Shrikanth Narayanan, "Using Physiology and Language Cues for Modeling Verbal Response Latencies of Children with ASD", in: Proceedings of International Conference on Acoustics, Speech, and Signal Processing (ICASSP), 2013

- [37]Rahul Gupta, **Chi-Chun Lee**, Sungbok Lee, Shrikanth Narayanan, “*Assessment of a Child’s Engagement Using Sequence Model Based Features*”, in: Proceedings of Workshop on Affective and Social Speech Signals, 2013
- [38]**Chi-Chun Lee\***, Athanasios Katsamanis, Brian Baucom, Panayiotis G. Georgiou, Shrikanth Narayanan, “*Using Measures of Vocal Entrainment to Inform Outcome-Related Behaviors in Marital Conflicts*”, in: APSIPA ASC Conference, 2012
- [39]Rahul Gupta, **Chi-Chun Lee**, Daniel Bone, Agata Rozga, Sungbok Lee, Shrikanth S. Narayanan, “*Acoustical analysis of engagement behavior in children*”, in: Proceedings of the Workshop on Child, Computer, and Interaction, 2012
- [40]**Chi-Chun Lee\***, Athanasios Katsamanis, Panayiotis G. Georgiou, Shrikanth S. Narayanan, “*Based on Isolated Saliency or Causal Integration? Toward a Better Understanding of Human Annotation Process using Multiple Instance Learning and Sequential Probability Ratio Test*”, in: Proceedings of Conference of the International Speech Communication Association (Interspeech), 2012
- [41]Theodora Chaspari, **Chi-Chun Lee**, Shrikanth S. Narayanan, “*Interplay between Verbal Response Latency and Physiology of Children with Autism during ECA Interactions*”, in: Proceedings of Conference of the International Speech Communication Association (Interspeech), 2012
- [42]Daniel Bone, **Chi-Chun Lee**, Shrikanth S. Narayanan, “*A Robust Unsupervised Arousal Rating Framework using Prosody with Cross-Corpora Evaluation*”, in: Proceedings of Conference of the International Speech Communication Association (Interspeech), 2012
- [43]Daniel Bone, Matthew P. Black, **Chi-Chun Lee**, Marian E. William, Pat Levitt, Sungbok Lee, Shrikanth S. Narayanan, “*Spontaneous-Speech Acoustic-Prosodic Features of Children with Autism and the Interacting Psychologist*”, in: Proceedings of Conference of the International Speech Communication Association (Interspeech), 2012
- [44]Rahul Gupta, **Chi-Chun Lee**, and Shrikanth S. Narayanan, “*Classification of Emotional Content of Sighs in Dyadic Human Interactions*”, in: Proceedings of the International Conference on Acoustics, Speech, and Signal Processing (ICASSP), 2012
- [45]**Chi-Chun Lee\***, Athanasios Katsamanis, Matthew Black, Brian Baucom, Panayiotis G. Georgiou, and Shrikanth S. Narayanan, “*Affective State Recognition in Married Couples’ Interactions Using PCA-based Vocal Entrainment Measures*”, in: Proceedings of Affective Computing and Intelligent Interaction (ACII), Lecture Notes in Computer Science, Memphis, TN, 2011
- [46]**Chi-Chun Lee\***, Athanasios Katsamanis, Matthew Black, Brian Baucom, Panayiotis G. Georgiou, and Shrikanth S. Narayanan, “*An Analysis of PCA-based Vocal Entrainment Measures in Married Couples’ Affective Spoken Interactions*”, in: Proceedings of Conference of the International Speech Communication Association (Interspeech), 2011
- [47]Emily Mower, **Chi-Chun Lee**, James Gibson, Theodora Chaspari, Marian Williams, and Shrikanth S. Narayanan, “*Analyzing the Nature of ECA Interactions in Children with Autism*”, in: Proceedings of Conference of the International Speech Communication Association (Interspeech), 2011
- [48]**Chi-Chun Lee\***, Matthew Black, Athanasios Katsamanis, Adam Lammert, Brian Baucom, Andrew Christensen, Panayiotis G. Georgiou and Shrikanth S. Narayanan, “*Quantification of Prosodic Entrainment in Affective Spontaneous Spoken Interactions of Married Couples*”, in: Proceedings of Conference of the International Speech Communication Association (Interspeech), 2010
- [49]Matthew Black, Athanasios Katsamanis, **Chi-Chun Lee**, Adam Lammert, Brian Baucom, Andrew Christensen, Panayiotis G. Georgiou and Shrikanth S. Narayanan, “*Automatic Classification of Married Couples’ Behavior using Audio Features*”, in: Conference of the International Speech Communication Association (Interspeech), 2010 **[Best Student Paper]**

- [50] **Chi-Chun Lee\*** and Shrikanth S. Narayanan, "*Predicting interruptions in dyadic spoken interactions*", in: Proceedings of the International Conference on Acoustics, Speech, and Signal Processing (ICASSP), 2010
- [51] Angeliki Metallinou, **Chi-Chun Lee**, Carlos Busso, Sharon Carnicke and Shrikanth S. Narayanan, "*The USC CreativeIT Database: A Multimodal Database of Theatrical Improvisation*", in: Multimodal Corpora: Advances in Capturing, Coding and Analyzing Multimodality (MMC), 2010
- [52] Emily Mower, Angeliki Metallinou, **Chi-Chun Lee**, Abe Kazemzadeh, Carlos Busso, Sungbok Lee and Shrikanth S. Narayanan, "*Interpreting ambiguous emotional expressions*", in: Proceedings of the International Conference on Affective Computing and Intelligent Interaction (ACII), 2009
- [53] **Chi-Chun Lee\***, Emily Mower, Carlos Busso, Sungbok Lee and Shrikanth S. Narayanan, "*Emotion recognition using a hierarchical binary decision tree approach*", in: Proceedings of Conference of the International Speech Communication Association (Interspeech), 2009 [**Emotion Challenge Winning Paper**]
- [54] **Chi-Chun Lee\***, Carlos Busso, Sungbok Lee and Shrikanth S. Narayanan, "*Modeling mutual influence of interlocutor emotion states in dyadic spoken interactions*", in: Proceedings of Conference of the International Speech Communication Association (Interspeech), 2009
- [55] **Chi-Chun Lee\***, Sungbok Lee and Shrikanth S. Narayanan, "*An analysis of multimodal cues of interruption in dyadic spoken interactions*", in: Proceedings of Conference of the International Speech Communication Association (Interspeech), pages 1678-1681, 2008 [**Best Student Paper Award Finalist**]

## **Abstract**

- [1] Yu-Fen Wang, Bor-Sheng Ko, Chi-Cheng Li, Jeng-Lin Li, Pei-Fang Weng, Huai-Hsuan Huang, Hsin-An Hou, Hwei-Fang Tien, **Chi-Chun Lee**, and Jih-Luh Tang, "An Artificial Intelligence Approach for B Lymphoblastic Leukemia Minimal Residual Disease Detection and Clinical Prognosis Prediction Using Flow Cytometry Data" in Annual Meeting of American Society of Hematology, 2017
- [2] Bor-Sheng Ko, Chi-Cheng Li, Yu-Fen Wang, Jeng-Lin Li, Hsin-An Hou, Pei-Fang Weng, Hwei-Fang Tien, **Chi-Chun Lee**, and Jih-Luh Tang, "An Artificial Intelligence Approach in Classifying Acute Myeloid Leukemia and Myelodysplastic Syndrome for Minimal Residual Disease Detection with Post Induction Prognosis Analysis Using Flow Cytometry" in Annual Meeting of American Society of Hematology, 2017
- [3] Chi-Cheng Li, Bor-Sheng Ko, Yu-Fen Wang, Jeng-Lin Li, Pei-Fang Weng, Hsin-An Hou, Xiu-Wen Liao, Chien-Ting Lin, Jia-Hou Liu, Hsun-I Sun, Hwei-Fang Tien, **Chi-Chun Lee**, and Jih-Luh Tang, "An Artificial Intelligence Approach for Predicting Allogeneic Hematopoietic Stem Cell Transplantation Outcome By Detecting Pre-Transplant Minimal Residual Disease in Acute Myeloid Leukemia Using Flow Cytometry Data" in Annual Meeting of American Society of Hematology, 2017
- [4] Shih-Yen Lin, Ya-Tse Wu, Chen-Pei Lin, Li-Wei Kuo, **Chi-Chun Lee\***, "Investigating Vocal Emotion by Graph Theoretical Analysis and Lobe-dependent Convolutional Neural Network on Functional MRI" in International Conference on Cognitive Science", in International Conference on Cognitive Science, 2017
- [5] Hengtai Jan, Shih-Yen Lin, Shiuan-Yeu Chen, Yu-Hisen Liao, Yi-Ping Chao, **Chi-Chun Lee**, Li-Wei Kuo, "*Voxel-based Graph-theoretical Analysis (VGA) of Brain Networks Modulated by External Vocal Emotion*", in: Human Brain Mapping, Hawaii, 2015
- [6] **Chi-Chun Lee\***, Brian Baucom, Athanasios Katsamanis, Panayiotis G. Georgiou and Shrikanth Narayanan, "*Modeling Vocal Interdependence during Marital Interaction: A Vector-based Approach*", In S. Weusthoff (Chair), Applied speech signal processing methods in couple and family research. Paper (oral) presented at the annual meeting of the Association for Behavioral and Cognitive Therapies, National Harbor, MD, November 2012

- [7] Brian Baucom, Esti Iturradle, **Chi-Chun Lee**, Panayiotis G. Georgiou, Shrikanth Narayanan and Gayla Margolin, "Multisystemic family aggression and dynamic emotional processes during triadic family interaction". In S. Weusthoff (Chair), Applied speech signal processing methods in couple and family research. Paper (oral) presented at the annual meeting of the Association for Behavioral and Cognitive Therapies, National Harbor, MD, November 2012.
- [8] Theodora Chaspari, **Chi-Chun Lee**, Matthew P. Black, and Shrikanth S. Narayanan, "Analyzing the Physiological Synchrony of Children with Autism and Their Parents with Signal Processing Techniques", in: Proceedings of the International Meeting for Autism Research, Toronto, 2012
- [9] **Chi-Chun Lee\***, Brian Baucom, Athanasios Katsamanis, Andrew Christensen, Panayiotis G. Georgiou and Shrikanth Narayanan, "Analyzing Vocal Entrainment in Married Couples' Interactions: a Signal-derived PCA-based Quantification Scheme and Affect Recognition using Factorial Hidden Markov Model", in: Conference of Association for Behavioral and Cognitive Therapies (ABCT): Clinical Research Methods and Statistics SIG (poster), Toronto, Nov. 2011

## **Sponsored Projects**

### *Ministry of Science and Technology (MOST)*

<b>Project Title</b>	<b>Role</b>	<b>Duration</b>	<b>Agency</b>
Crowd-AI Users Representation Learning, Affect Computing, and Behavior Shaping (107-2634-F-007 -006 -)	PI	2018/01/01-2018/12/31	MOST
A Neural-Computational Approach to Investigate Multi-modal Processing and Integration of Emotional Expressions: In Search of Cultural Specificity (107-2420-H-194 -006 -)	CO-PI	2018/01/01-2018/12/31	MOST
Robust Automatic Oral Presentation Assessment (106-2221-E-001-017-MY2)	CO-PI	2017/08/01~2019/07/31	MOST
Development of Automated and Objective Pain Level Assessment by Modeling Multimodal Human Behaviors during Emergency Triage (106-2221-E-007-027-)	PI	2017/08/01~2018/07/31	MOST
Large-Scale Cyber-Physical Data Analysis for Human-Centric Learning, Recommendation, and Behavior Shaping (1/3)(106-3114-E-007-005-)	CO-PI	2017/06/01~2018/05/31	MOST
Exploring the Neural Representation Associated with Cognitive Adaptation in Multiple Cultural Domains using MRI(106-2420-H-003-001-MY2)	CO-PI	2017/01/01~2018/12/31	MOST
Development of Objective Computational Algorithms for Modeling Atypical Socio-Communicative Multimodal Behaviors during Autism Diagnostic Observation Schedule (ADOS) Interview Sessions (105-2221-E-007-107-MY2)	PI	2016/08/01~2018/07/31	MOST
Decoding Neuroperceptual Mechanisms of Vocal Emotion Expressions using Brain MR Neuroimaging and Speech Affective Computing (104-2420-H-400-001-MY2)	CO-PI	2015/01/01~2016/12/31	MOST
Robust Multimodal Emotion Modeling for Cross-domain Applications (103-2218-E-007-012-MY3)	PI	2014/08/01~2017/07/31	MOST

### *Other Agencies*

Big Data Analytics and Informatics Algorithm Development	Sub-project PI	2015/01/01~2015/12/31	VGHUST
NZXT Cam: Intelligent DIY-Computer Hardware Recommendation System for Gaming	PI	2014/11/01~2015/10/30	NZXT Inc.
Sentri Smart Home Monitoring System – Intelligent Module's Research and Development	PI	2014/09/01~2015/08/31	Kronosight Inc.
A Study of Automatic Oral Evaluation Systems	CO-PI	2015/01/01~2016/12/31	NAER



Correlation of Facial Expression Analysis and Pain Scale at Triage	CO-PI	2015/09/01~2017/07/31	CGM Hospital
Developing Stroke Predictive Index using Deep Learning Neural Network from Massive Electronic Health Records	Sub-project PI	2016/01/01~2016/12/31	VGHUST
Developing Hemorrhage Predictive Index of Anticoagulant and Antiplatelet Agent using Deep Learning Neural Network from Massive Electronic Health Records	Sub-project PI	2018/01/01~2018/12/31	VGHUST

## **Professional Membership**

IEEE member, International Speech Communication Association (ISCA) member, The Association for Computational Linguistics and Chinese Language Processing (ACLCLP) member

## **Academic Services**

### *Journal Special Issue Editor*

Journal of Computer Speech Language (CSL): Special issue, Speech and Language Processing for Behavioral and Mental Health Applications

### *International*

Annual Conference of International Speech Communication (Interspeech) 2016, 2018 Area Chair

Annual Conference of Affective Computing and Intelligent Interaction (ACII) 2017 Senior Technical Committee

ACM International Conference on Multimodal Interaction (ICMI) 2018 Publicity Chair

International Symposium on Chinese Spoken Language Processing (ISCSLP) 2018 Sponsor Chair

### *Domestic*

Annual Conference on Computational Linguistics and Speech Processing (ROCLING) 2018 General Chair

Annual Conference on Computational Linguistics and Speech Processing (ROCLING) 2017 Technical Chair

Annual Conference on Computational Linguistics and Speech Processing (ROCLING) 2016 Local Chair

Speech Processing Workshop (SWS) 2017 General Chair

## **Review Services**

### *Journals*

IEEE Transactions on Audio, Speech, and Language, IEEE Transaction on Affective Computing, IEEE Signal Processing Magazine, Journal of Computer Speech and Language, Journal of Speech Communication, IEEE Transaction on Information Forensic and Security, IEEE Wireless Communication Magazine, IEEE Journal on Emerging and Selected Topics, Elsevier Digital Signal Processing, Communications of the ACM, Transactions on Multimedia Computing Communications and Applications, Journal of Language Resource and Evaluation, Journal of the Chinese Institute of Engineers

### *Conferences*

The IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP), Annual Conference of International Speech Communication (Interspeech), Annual Conference of Affective Computing and Intelligent Interaction (ACII), ACM International Conference on Multimodal Interaction (ICMI), European Signal Processing Conference (EUSIPCO), The International Conference on Pattern Recognition (ICPR), The IEEE International Symposium on Circuits and Systems (ISCS), APSIPA Annual Summit

### *Project Proposals*

2018 Ministry of Justice Taiwan Proposal Review

## **Teaching Experiences**

### **National Tsing Hua University**

EE 6640: Speech Signal Processing

EE 3660: Probability

**University of Southern California:** Teaching Assistant

EE 619: Advanced Topics in Automatic Speech Recognition

EE 519: Speech Recognition and Processing for Multimedia

## **Related Media News and Articles**

### **Interdisciplinary Insights into Group and Team Dynamics**

(4TU.Federation, July 13, 2016)

### **NTHU-EE Mix Workshop**

(NTHU-EE Web, June 23, 2016)

### **So happy together**

(USC News, February 4<sup>th</sup>, 2013)

### **How motion capture technology can measure human behaviour**

(BBC News, August 20<sup>th</sup>, 2010)

### **Actions Speak Louder Than Words**

(USC News, June 29<sup>th</sup>, 2010)

### **Theatre and Engineering Schools Collaborate to Study Interactions**

(USC Daily Trojan News, April 6<sup>th</sup>, 2010)

### **Two Cultures**

(Language Log by Professor Mark Liberman – University of Pennsylvania, March 20<sup>th</sup>, 2010)

### **USC SAIL Researchers Win the Interspeech 2009 Emotion Challenge Award**

(USC EE News, November 05<sup>th</sup>, 2009)

### **The INTERSPEECH 2009 Emotion Challenge: Results and Lessons Learnt**

(IEEE Signal Processing Society SLTC Newsletter, October 2009)

## **Invited Talks**

### *Lecture Talks*

邀請人	題目	地點	日期
宏盟媒體集團 PHD AI 雲講堂	情緒運算於數位行銷之應用	三創中心	2018/08/20
人工智慧學校	Behavior Computing for Emotion and Personality	中研院	2018/08/10
AI MEETUP TAIPEI	AI for Personality, Emotion and Mental States Recognition	台大	2018/08/09
APPIER	Learning Human-Centered Analytics from Multimodal Data: Case Studies in Health Applications	Appier	2018/08/09
林口長庚胸腔內科暨清華大學 電機系智慧醫療論壇	Advancing Clinical Decisions beyond Status-quo with Learnable Analytics	林口長庚	2018/08/04
瑞昱半導體	Learning Intelligent Human-centered Analytics from Multimodal Behavior Signals	瑞昱	2018/08/02
自強基金會	語音處理與情緒辨識	清大	2018/07/30
IEEE ICME Workshop on Media Analytics for Societal Trend	A Pilot Study in Deriving Political Stance Representation with User's Profile and Social Media Posting	San Diego, USA	2018/07/23
Rework in Healthcare	人工智慧醫療診斷分析與應用	Hong Kong	2018/06/08
Artificial intelligence based assistive diagnose and treatment for Autism spectrum disorder	Behavioral Signal Processing: Multimodal Behavior Computing for Autism Spectrum Disorder	杜克昆山 (Duke Kunshan University)	2018/05/24
台大腦心所	Learning from Measurable Signals to Compute Human Emotion	臺大醫院	2018/05/01
工研院產業學院 (12小時課程)	人工智慧於人類行為與情緒之分析決策應用	新竹工研院	2018/04/23 2018/04/30

資策會數位教育研究所 (14 小時課程)	人工智慧醫療診斷分析與應用	台北資策會	2018/03/17 2018/03/18
中國醫藥大學	機器智能與人類行為於醫療應用	中國醫	2018/04/10
林口長庚醫院巨量資料及統計中心	機器智能與人類行為於醫療應用	林口長庚	2018/03/27
台灣人智慧學校	機器智能與人類行為於醫療應用	中研院	2018/03/10
臺灣認知神經科學學會年會 (TSCN)	A Perspective on using Machine Learning in fMRI Data Modeling: Human face processing and beyond	中國醫	2018/01/20
圖書資訊學專題計畫成果發表暨研究發展趨勢研討會 keynote	大數據分析於資訊行為之研究趨勢	台北科技部院區	2017/12/08
台灣資料科學協會:一日課程	Emotion-AI: 運用人工智慧實現情緒辨識	中研院	2017/12/16
台灣人工智慧年會	機器智能與人類行為: 跨領域決策分析於醫療應用	中研院	2017/11/09
Affectiva inc.	Computational Exploration of Human Emotion Recognition	Boston, USA	2017/10/23
兩岸清華學術交流	機器智能決策分析於醫療應用	蘇州, 中國	2017/10/15
Bilateral Workshop between NTHU and Tohoku University GSIS	Computing Human Behavior Health Analytics from Speech, Video, and Language	新竹, 台灣	2017/10/13
大數據於資訊行為分析與應用研討會 keynote	大數據時代的人類資訊行為研究現況與趨勢	政大	2017/09/30
台灣生醫電子工程協會年會	Behavior Computing for Health Applications	新竹喜來登	2017/04/28
中華民國臨床心理年會	Deriving Human Behavior Analytics using Audio-Video Data: Recent work in Autism Spectrum Disorder (ASD)	台大	2017/04/23
廣達電腦	人類行為訊號處理: 新興跨學科(醫療、教育)研究應用實例分享	廣達	2017/03/30
台中榮總醫學研究部 Big Data 專題演講	Behavioral Signal Processing: Enabling behavior analytics for Applications in Health and Education	台中榮總	2017/02/22
經濟部 Mix Taiwan 創意 X 技術-知識分享沙龍	新興人工智慧跨領域研究實例分享	台北、經濟部 線上直播	2017/01/18
台灣資料科學協會:一日課程	人類行為大數據分析:資料科學如何應用在教育及醫療領域	中研院	2017/01/15
台大公衛健康與虛擬社群工作坊	人類行為訊號處理: 跨學科(教育、醫療)人類行為量化分析之決策工具	台大公衛	2016/12/16
中華民國精算學會年會	人類行為訊號處理:全新跨學科(教育、醫療)人類行為量化分析之決策工具	世貿會場	2016/11/30
Information Retrieval Workshop	Exploration in Human Affect Modeling: Engineering Advancements and Next Steps	中研院	2016/11/24
台灣資料科學協會:一日課程	人類行為大數據分析:資料科學如何應用在教育及醫療領域	中研院	2016/10/30
Bilateral Workshop between NTHU and Tohoku University GSIS	Deriving Human Behavior Analytics using Audio-Video Data: Challenges and Opportunities	仙台, 日本	2016/10/25
台灣資料科學年會	人類行為大數據分析:資料科學如何應用在教育及醫療領域	中研院	2017/07/14
Lorentz Workshop on Interdisciplinary Insights into	Behavioral Signal Processing	Lorentz Center, Leiden, Netherland	2016/06/29

Small Group and Team Dynamics			
Speech Processing Workshop (SWS)	A window into you: BSP effort for quantifying human behaviors across domains of health, education, and psychology	台大	2016/03/18
Bilateral Workshop between NTHU and Tohoku University GSIS	Cross-corpora Prosody-based Emotional Arousal Indicator and its Analysis in Affective Human Production-Perception Interplay	新竹，台灣	2015/10/28
Taiwan-Japan Symposium on Psychological, Physiological, and Electro-Acoustics	Prosody-based Emotional Arousal Indicator and its Analysis in Affective Production-Perception Interplay	清大	2015/10/23
Bilateral Workshop between NTHU and Tohoku University GSIS	Behavioral Signal Processing: An interdisciplinary effort in modeling human behaviors with applications in domains of behavior science	仙台，日本	2014/10/21
Speech Processing Workshop (SWS)	Understanding Dyadic Human Spoken Interactions Using Speech Processing Techniques: Case studies in Autism Spectrum Disorder (ASD) and behavioral Couple Therapy	台北大學	2014/08/01

#### *Graduate Seminar Talks*

NTHU-EE, NTU-EE, NCTU-EE, Academia Sinica-TIGP SNHCC, FJU-CSIE, PU-FMath, Academia Sinica-Econ, NTUH-Psychiatry, CCU-CogPsy, NCCU-CS, National Academy of Educational Research (NAER), National Academy of Civil Service (NACS)