

# Theodora Chaspari

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      [https://www.researchgate.net/profile/Theodora\\_Chaspari](https://www.researchgate.net/profile/Theodora_Chaspari)
- RESEARCH INTERESTS
- Wearable technology, biomedical/physiological signal processing (representations inspired by cognitive neuroscience and interpretations driven from human studies)
  - Behavioral signal processing, affective computing, human-computer interaction
  - Data science, big data analytics, machine learning
  - Speech processing
- EDUCATION
- Ph.D., Electrical Engineering, University of Southern California, 2017  
Ph.D. Advisor: Prof. Shrikanth Narayanan  
Ph.D. Thesis: “Knowledge-Driven Representations of Physiological Signals: Developing Measurable Indices of Non-Observable Behavior”
  - M.S., Electrical Engineering, University of Southern California, 2012
  - B.S., Electr. & Computer Engr., National Technical University of Athens, 2010 (with honors)  
Advisor: Prof. Petros Maragos  
Thesis: “Automatic Emotion Recognition from Speech”
- PROFESSIONAL EXPERIENCE
- Chief Technology Officer (CTO), CoupleGoals (2017-)
  - Assistant Professor, Texas A&M, Department of Computer Science & Engineering (2017-)
  - Research Assistant, Signal Analysis and Interpretation Lab (SAIL), University of Southern California (2011 - 2017)
  - Lab Associate Intern, Disney Research (Summer 2015)
  - Undergraduate Researcher, Mental Health Care Unit, Evgenidion Hospital University of Athens (2009 - 2010)
- PROJECTS
- Targeted Robust Audio Processing System (DARPA RATS Project, with IBM)
  - Computational Behavioral Science: Modeling, Analysis and Visualization of Social and Communicative Behavior (NSF, Expeditions in Computing)
  - Quantitative comparison of wired and wireless EDA data collection equipment for measuring arousal in typically developing children and children with autism spectrum disorders in their home environment (California Foundation of Occupational Therapy Research Grant)
  - Using Mobile Technology to Measure Romantic Partners’ Emotions, Vocalizations, and Physiology as Possible Indicators of Dating Aggression (NIH/NCATS, Pilot Funding SC CTSI)
  - Capturing Life as it is Lived: Using Mobile Technology to Identify Real World Indicators of Dating Aggression (URAP, USC)
- AWARDS
- USC Women in Science and Engineering (WiSE) travel grant for attending EMBC 2016
  - USC Women in Science and Engineering (WiSE) Merit Fellowship (2015)
  - IEEE Signal Processing Society Travel Grant for attending ICASSP 2014
  - USC Women in Science and Engineering (WiSE) travel grant for attending ICASSP 2014
  - USC Annenberg Graduate Fellowship (2010-2012)
  - USC Women in Science and Engineering (WiSE) Graduate Top-off Fellowship (2010-2012)
  - Academic Honor, Federal Scholarship Institution of Greece (2005-2006, 2007-2008)

RESEARCH TALKS  
AND LECTURES

- “Bio-Behavioral Signals and Systems: From signal representations to novel health applications,” CU Boulder, San Diego State University, SUNY Buffalo, Texas A&M, Washington University in St. Louis, 2017
- “Knowledge-driven physiological representations for analyzing and interpreting wearable sensor signals,” Big Data and Human Behavior Symposium, University of Southern California, 2016 (Best presentation award)
- “Quantifying Physiological Synchrony in Romantic Relationships with Joint Sparse Representation,” Computational Mental Health Workshop, Society for Personality and Social Psychology (SPSP) Annual Convention, 2016
- “Knowledge-driven representations of physiological signals: Developing measurable indices of non-observable behavior,” Flash talk, USC Ming Hsieh Institute Research Festival, University of Southern California, 2015
- “Markov Chain Monte Carlo inference of parametric dictionaries for sparse Bayesian approximations,” Flash talk, MBMC Workshop: Communications, Inference and Computing in Molecular and Biological Systems, University of Southern California, 2015
- “Introduction to Biomedical Signal Processing,” Wireless and Mobile Networks Design and Laboratory, Prof. Murali Annavaram, University of Southern California, 2015
- “Analyzing the structure of narratives from children with ASD,” Annual Meeting of NSF Expedition Project in Computational Behavioral Science, Carnegie Mellon University, 2013

BOOK CHAPTERS

1. D. Bone, *T. Chaspari*, and S.S. Narayanan, “*Behavioral signal processing and Autism. Learning from multimodal behavioral signals*,” Autism Imaging and Devices, 2017.

JOURNAL  
PUBLICATIONS

1. G.W. Corner, D.E. Saxbe, *T. Chaspari*, H.F. Rasmussen, L. Perrone, C. Pettit, M. Friendly, A.C. Timmons, and G. Margolin, “*Compassion in a Heartbeat: Physiology During Couples’ Loss Discussions*,” under review.
2. D. Bone, C.C. Lee, *T. Chaspari*, J. Gibson, and S.S. Narayanan, “*Signal Processing and Machine Learning for Behavioral and Mental Health Research and Clinical Applications*,” accepted in Signal Processing Magazine, 2017.
3. A.C. Timmons, *T. Chaspari*, S.C. Han, L. Perrone, S.S. Narayanan, and G. Margolin, “*Multimodal detection of conflict in couples using wearable technology*,” IEEE Computer, 50(3): 50-59, 2017.
4. A.C. Timmons, S.C. Han, L. Perrone, *T. Chaspari*, B.R. Baucom, S.S. Narayanan, and G. Margolin, “*New frontiers in ambulatory assessment: Big data methods for capturing couples’ emotions, vocalizations, and physiology in daily life*,” Social Psychological and Personality Science, 2017.
5. *T. Chaspari*, A. Tsiartas, P. Tsilifis, and S.S. Narayanan, “*Markov Chain Monte Carlo Inference of Parametric Dictionaries for Sparse Bayesian Approximations*,” IEEE Transactions on Signal Processing, 64(12): 3077-3092, 2016.
6. *T. Chaspari*, A. Tsiartas, L.I. Stein, S.A. Cermak, and S.S. Narayanan, “*Sparse Representation of Electrodermal Activity with Knowledge-Driven Dictionaries*,” IEEE Transactions on Biomedical Engineering, 62(3): 960-971, 2015.
7. *T. Chaspari*, C. Soldatos, and P. Maragos, “*The development of the Athens Emotional States Inventory (AESI): collection, validation and automatic processing of emotionally loaded sentences*,” World Journal of Biological Psychiatry, 23: 1-11, 2015.

CONFERENCE  
PUBLICATIONS

1. *T. Chaspari*, A. C. Timmons, B. Baucom, L.Perrone, K. J. W. Baucom, P. Georgiou, G. Margolin, and S.S. Narayanan, “*Exploring Sparse Representation Measures of Physiological Synchrony for Romantic Couples*,” to appear in Affective Computing and Intelligent Interaction Conference (ACII), 2017.

2. R. Balasubramanian, T. Chaspari and S.S. Narayanan, "A Knowledge-Driven Framework for ECG Representation and Interpretation for Wearable Applications," Proc. IEEE International Conference on Audio, Speech and Signal Processing (ICASSP), pp. 1018-1022, New Orleans, LA, 2017.
3. T. Chaspari, S.C. Han, D. Bone, A.C. Timmons, L. Perrone, G. Margolin, and S.S. Narayanan, "Quantifying Regulation Mechanisms in Dating Couples through a Dynamical Systems Model of Acoustic and Physiological Arousal," Proc. IEEE International Conference on Audio, Speech and Signal Processing (ICASSP), pp. 3001-3005, New Orleans, LA, 2017.
4. D. Bone, J. Gibson, T. Chaspari, D. Can, and S.S. Narayanan, "Speech and Language Processing for Mental Health Research and Care," Proc. Asilomar Conference on Signals, Systems, and Computers, Pacific Grove, CA, 2016.
5. T. Chaspari and J. Fain Lehman, "An Acoustic Analysis of Child-Child and Child-Robot Interactions for Understanding Engagement during Speech-Controlled Computer Games," Proc. Interspeech, pp. 595-599, San Francisco, CA, 2016.
6. T. Chaspari, A. Tsiartas, L.I. Stein Duker, S.A. Cermak, and S.S. Narayanan, "EDA-Gram: Designing Electrodermal Activity Fingerprints for Visualization and Feature Extraction," Proc. International Conference of the IEEE Engineering in Medicine and Biology Society, pp. 403-406, Orlando, FL, 2016.
7. A. Youn, T. Chaspari, R. Gupta, and S.S. Narayanan, "Capturing the Structure of Electrodermal Activity with Deep Neural Networks," Proc. International Conference of the IEEE Engineering in Medicine and Biology Society, Orlando, FL, 2016.
8. T. Chaspari, S.C. Han, D. Bone, A.C. Timmons, L. Perrone, G. Margolin, and S.S. Narayanan, "Dynamical Systems Modeling of Acoustic and Physiological Arousal in Young Couples," Proc. Association for the Advancement of Artificial Intelligence (AAAI) Spring Symposia, pp. 21-24, Stanford, CA, 2016.
9. R. Gupta, T. Chaspari, J. Kim, N. Kumar, D. Bone, and S.S. Narayanan, "Pathological Speech Processing: State-of-the-art, current challenges, and future directions," Proc. IEEE International Conference on Audio, Speech and Signal Processing (ICASSP), pp. 6470-6474, Shanghai, China, 2016.
10. T. Chaspari, S. Al Moubayed, and J. Fain Lehman, "Exploring children's verbal and acoustic synchrony: Towards promoting engagement in speech-controlled robot-companion games," Proc. First International Workshop on Modeling Interpersonal Synchrony, International Conference on Multimodal Interaction (ICMI), pp. 21-24, Seattle, WA, 2015.
11. R. Gupta, T. Chaspari, P. Georgiou, D.C. Atkins, and S.S. Narayanan, "Analysis and modeling of the role of laughter in motivational interviewing based psychotherapy conversations," Interspeech, pp. 1962-1966, Dresden, Germany, 2015.
12. T. Chaspari, B. Baucom, A. C. Timmons, A. Tsiartas, L. Borovsky Del Piero, K. J. W. Baucom, P. Georgiou, G. Margolin, and S.S. Narayanan, "Quantifying EDA synchrony through joint sparse representation: A case-study of couples' interactions," Proc. IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP), pp. 817-821, Brisbane, Australia, 2015.
13. T. Chaspari, M. Goodwin, O. Wilder-Smith, A. Gulsrud, C. A. Mucchetti, C. Kasari, and S.S. Narayanan, "A non-homogeneous Poisson Process model of skin conductance responses integrated with observed regulatory behaviors for Autism intervention," Proc. IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP), pp. 1611-1615, Florence, Italy, 2014.
14. T. Chaspari, D. Dimitriadis, and P. Maragos, "Emotion classification of speech using modulation features," Proc. European Signal Processing Conference (EUSIPCO), Lisbon, Portugal, 2014.
15. T. Chaspari, E. Mower Provost, and S.S. Narayanan, "Analyzing the Structure of Parent-Moderated Narratives from Children with ASD Using an Entity-Based Approach," Proc. Interspeech, pp. 2430-2434, Lyon, France, 2013.
16. A. Tsiartas, T. Chaspari, A. Katsamanis, P. Kumar Gosh, M. Li, M. Van Segbroeck, A. Potamianos, and S.S. Narayanan, "Multi-band long-term signal variability features for robust

- voice activity detection,” Proc. Interspeech, pp. 718-722, Lyon, France, 2013.
17. D. Bone, T. Chaspari and K. Audhkhasi and J. Gibson and A. Tsiartas and M. Van Segbroeck and M. Li and S. Lee, and S.S. Narayanan, “*Classifying Language-Related Developmental Disorders from Speech Cues: the Promise and the Potential Confounds*,” Proc. Interspeech, pp. 182-186, Lyon, France, 2013.
  18. D. Bone, C.C. Lee, T. Chaspari, M. P. Black, M. Williams, S. Lee, P. Levitt, and S.S. Narayanan, “*Acoustic-Prosodic, Turn-taking, and Language Cues in Child-Psychologist Interactions for Varying Social Demand*,” Proc. Interspeech, pp. 2400-2404, Lyon, France, 2013.
  19. T. Chaspari, D. Bone, J. Gibson, C.C. Lee, and S.S. Narayanan, “*Using physiology and language cues for modeling verbal response latencies of children with ASD*,” Proc. IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP), pp. 3702-3706, Vancouver, BC, Canada, 2013.
  20. T. Chaspari, C.C. Lee, and S.S. Narayanan, “*Interplay between verbal response latency and physiology of children with autism during ECA interactions*,” Proc. Interspeech, pp. 1319-1322, Portland, OR, 2012.
  21. T. Chaspari, E. Mower Provost, A. Katsamanis, and S.S. Narayanan, “*An acoustic analysis of shared enjoyment in ECA interactions of children with Autism*,” Proc. IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP), pp. 4485-4488, Kyoto, Japan, 2012.
  22. E. Mower, C.C. Lee, J. Gibson, T. Chaspari, M.E. Williams, and S.S. Narayanan, “*Analyzing the Nature of ECA Interactions in Children with Autism*,” Proc. Interspeech, pp. 2989-2993, Florence, Italy, 2011.

#### RESEARCH POSTERS

1. A.C. Timmons, S.C. Han, Y. Kim, O. Shin, L. Perrone, T. Chaspari, S.S. Narayanan, and G. Margolin, “*Family-of-Origin Aggression, Physiological Stress Reactivity in Daily Life, and the Perpetration of Aggression in Young Adulthood*,” Society for Research and Child Development (SRCD) Biennial Meeting, Austin, TX, 2017.
2. R. Arbel, M.E. Daspe, T. Chaspari, L. Perrone, C. Pettit, M. Friendly, M. Estafanous, and G. Margolin, “*Let’s talk about loss: Adverse Childhood Experiences and Electrodermal Activity During Dating Couples’ Loss Discussions*,” Society for Research and Child Development (SRCD) Biennial Meeting, Austin, TX, 2017.
3. S.C. Han, A.C. Timmons, Y. Kim, H. Rasmussen, T. Chaspari, P. Bisla, M. Estafanous, P. Rajeev, K. Salehani, O. Shin, L. Perrone, and G. Margolin, “*Parent-to-child aggression and anger words in daily life among young adults*,” Society for Research and Child Development (SRCD) Biennial Meeting, Austin, TX, 2017.
4. K. Leo, A.O. Crenshaw, J. Hogan, S. Bourne, T. Chaspari, K.J.W. Baucom, and B.R. Baucom, “*Demand/withdraw behavior, emotional expression, and physiological reactivity during marital conflict*,” Association for Behavioral and Cognitive Therapies (ABCT) Annual Convention, Chicago, IL, 2015.
5. A.C. Timmons, T. Chaspari, L. Perrone, T. Feng, S.S. Narayanan, and G. Margolin, “*Dating Aggression and Physiological Connectedness in Everyday Life*,” Biennial Conference of the Society for Ambulatory Assessment, State College, PA, 2015.
6. A.C. Timmons, T. Feng, T. Chaspari, S.S. Narayanan, and G. Margolin, “*An Evaluation of Novel Methodologies for Capturing Couple Dynamics in the Home Environment*,” International Convention of Psychological Science (ICPS), Amsterdam, The Netherlands, 2015.
7. A.C. Timmons, T. Chaspari, S.S. Narayanan, and G. Margolin, “*The Association between Family Aggression History and Physiological Coregulation in Dating Relationships*,” Society for Research and Child Development (SRCD) Biennial Meeting, Philadelphia, PA, 2015.
8. L. Stein, T. Chaspari, S.A. Cermak, S.S. Narayanan, A. Schell, and M.E. Dawson, “*Using a Wireless Measure of Electrodermal Activity: Comparisons to Traditional Wired Equipment*,” International Meeting for Autism Research (IMFAR), Salt Lake City, UT, 2015.
9. L. Stein, T. Chaspari, S.A. Cermak, S.S. Narayanan, A. Schell, and M.E. Dawson, “*Preliminary validation of the Q-Sensor: An innovative measure of real world electrodermal activity*,” Society

of Pediatric Psychology Annual Conference (SPPAC), San Diego, CA, 2015.

10. T. Chaspari, C.C. Lee, M.P. Black, and S.S. Narayanan, "Analyzing the Physiological Synchrony of Children with Autism and their Parents with Signal Processing Techniques," International Meeting for Autism Research (IMFAR), Toronto, Canada, 2012.
11. M. P. Black, D. Bone, T. Chaspari, A. Tsiartas, P. Gorrindo, M. E. Williams, P. Levitt, and S.S. Narayanan, "Signal Processing Tools for the Automatic Analysis of Child-Psychologist Interactions," International Meeting for Autism Research (IMFAR), San Diego, CA, USA, 2011.

#### PATENTS

1. A.C. Timmons, T. Chaspari, G. Margolin, and S.S. Narayanan, "A Technology-Facilitated Support System for Monitoring and Understanding Interpersonal Relationships," Disclosed, 2017.
2. A.C. Timmons, T. Chaspari, M.W. Ahle, G. Margolin, and S.S. Narayanan, "An Expert-Driven, Technology-Facilitated Intervention System for Improving Interpersonal Relationships," Disclosed, 2017.

#### SERVICE AND PROFESSIONAL ACTIVITIES

##### Professional Societies

Institute of Electrical and Electronics Engineers (IEEE)  
Engineering in Medicine and Biology Society (EMBS)  
International Speech Communication Association (ISCA)  
Association for Computing and Machinery (ACM)

##### Review Services

Annals of Biomedical Engineering • IEEE Sensors Journal • IEEE Transactions on Affective Computing • IEEE Signal Processing Letters • IEEE Transactions on Applied Perception • IEEE Transactions on Biomedical Engineering • IEEE Transactions on Human-Machine Systems • International Journal of Human-Computer Studies • Nature Scientific Reports • Clinical Psychology and Pharmacology • Journal of Electrical and Computer Engineering • Journal of Optimization Theory and Applications

International Conference on Multimodal Interaction • ACM International Conference on Pervasive and Ubiquitous Computing • International Joint Conference on Neural Networks • IEEE Control Systems Society Conference Management System

##### Organization Committees

- Affective Computing and Intelligent Interaction (ACII) 2017: Local Organizing Co-Chair
- Body Sensor Networks (BSN) 2018: Workshop Chair

#### MEDIA COVERAGE

- **Romantic couples' automatic conflict detection in real-life (2017)**  
The interdisciplinary work on modeling and quantifying romantic couples' relationships has been reported in *NBC*, *Daily Mail*, *TechCrunch*, *IEEE Spectrum*, *Digital Trends*, *CNET*, *Yahoo News*, *Science Newsline*, etc.