

Shrikanth S. Narayanan

*Vice President for Presidential Initiatives, University Professor and Niki & C. L. Max Nikias Chair in Engineering
Professor of Electrical & Computer Engineering, Computer Science, Linguistics, Psychology, Neuroscience,
Pediatrics and Otolaryngology-Head & Neck Surgery*

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Professional Interests: **HUMAN-CENTERED SENSING, COMPUTING AND INFORMATION PROCESSING**

- Audio, Speech and Language Processing, Automatic Speech/Speaker Recognition, Speech Translation
- Multimodal Signal Processing and Machine Learning, Computational Media Intelligence
- Human Behavioral Signal Processing, Emotions, Affective computing, Behavioral Machine Intelligence
- Human-Machine and Machine-Mediated Interactions; Spoken dialog and Multimodal Conversational Systems
- Speech production modeling, Articulatory-Acoustics, Speech/Audio Synthesis; Music Processing
- Biomedical Signal Processing and Modeling: Imaging & Instrumentation; Human Health and Wellness

Education:

- June 1995 **Ph.D.** in *Electrical Engineering*, University of California, Los Angeles (UCLA).
Fields of Specialty: Signal Processing, Controls and Communication, Operations Research.
Thesis: “*Fricative consonants: An articulatory, acoustic, and systems study*”
Committee: A. Alwan (Chair), A. V. Balakrishnan, P. Ladefoged, M. M. Sondhi, A. Wilson
- June 1992 **Engineer degree** in *Electrical Engineering*, UCLA
- December 1990 **Master of Science** in *Electrical Engineering*, UCLA
Thesis: “*Nonlinear filtering and smoothing for noisy alternating renewal process signals*”
Committee: A. V. Balakrishnan, Richard Mortensen, Paul Wang
- June 1988 **Bachelor of Engineering** in *Electrical & Electronics Engineering*
 College of Engineering–Guindy, Anna University, Madras, India

Professional Experience:

- 20-present University Professor, **University of Southern California (USC)**
- 24-present Vice President of Presidential Initiatives, Office of the President, USC
- 16-present Niki & C. L. Max Nikias Chair in Engineering, USC
- 17-present Research Director & Distinguished Principal Scientist, Information Sciences Institute, USC
- 10-present Director, Ming Hsieh Institute, Electrical Engineering, USC
- 07-16 Andrew J. Viterbi Professor of Engineering, USC
- 05-present Professor, Department of Electrical & Computer Engineering, Department of Computer Science, Department of Linguistics, Department of Psychology (*Joint*), Program in Neuroscience; Departments of Pediatrics, Otolaryngology-Head & Neck Surgery; Member, Signal & Image Processing Institute Director, Signal Analysis and Interpretation Laboratory (SAIL)
- 22-present Visiting Faculty Researcher, Google (20-22, Visiting Researcher)
- 17-21 Chief Scientist, Lyssn.io, Inc.
- 16-present Chief Scientist, Behavioral Signal Technologies, Inc. (13-17 Behavioral Informatix, Inc.)
- 02-08 Research Area Director & Investigator, Integrated Media Systems Center (NSF-ERC)
- 03-05 Associate Professor, Department of Electrical Engineering (Computer Science, Linguistics: *Joint*)
- 00-03 Assistant Professor, Department of Electrical Engineering-Systems
- 95-00 **AT&T Labs-Research, Florham Park, NJ (and formerly, AT&T Bell Labs, Murray Hill)**
- 99-00 Principal Technical Staff Member (99-00); Senior Technical Staff Member (95-99)
Speech and Image processing Research Laboratory
 Speech processing, Automatic speech recognition, Spoken dialog systems
 Multimodal interfaces, Communication and information service applications; Speech acoustics.
- 9/92 - 5/95 **Research Assistant, Department of Electrical Engineering, UCLA**
Speech Processing and Auditory Perception Laboratory
 Speech analysis, modeling, synthesis; Biomedical imaging and instrumentation.
- 6/93-10/93 **Member of Technical Staff, AT&T Bell Laboratories, Murray Hill, NJ (intern)**
 Speech analysis and articulatory synthesis research
- 6/92-10/92 **Member of Technical Staff, AT&T Bell Laboratories, Murray Hill, NJ (intern)**
 Video coding; Motion compensation techniques
- 9/89 - 10/91 **Research Assistant, Department of Electrical Engineering, UCLA**
 Filtering and control algorithms for energy systems modeling.

Awards and Honors:

- 2024 Edward J. McCluskey Technical Achievement Award "for pioneering contributions to speech, language and multimedia processing and affective computing and their human-centered societal applications", IEEE Computer Society
- 2024 Fellow of ACM, "for contributions to speech, language, multimedia processing, and affective computing and their human-centered applications"
- 2024 2023 IEEE SPS Claude Shannon-Harry Nyquist Technical Achievement Award "for contributions to spoken language processing technologies and their societal applications", IEEE Signal Processing Society
- 2023 2023 Richard Deswarte Prize in Digital History (for "Studying Large-Scale Behavioral Differences in Auschwitz-Birkenau with Simulation of Gendered Narratives" published in 2022 Digital Humanities Quarterly with Gabor Toth, Tim Hempel, Krishna Somandepalli)
- 2023 ISCA Medal for Scientific Achievement, International Speech Communication Association
- 2022 Member - European Academy of Sciences and Arts
- 2022 Fellow of the Association for the Advancement of Affective Computing (AAAC)
- 2022 Guggenheim Fellow
- 2020 ACM ICMI Sustained Accomplishment Award
- 2020 University Professor ("awarded very selectively by the President based on multi-disciplinary interests and significant accomplishments in several disciplines"), University of Southern California
- 2020 Senior Research Award, USC Viterbi School of Engineering
- 2020 Winner Team, MediaEval Challenge Evaluation: "Emotion and theme recognition in music"
- 2019 USC Associates Award for Creativity in Research and Scholarship
- 2019 Fellow, American Institute for Medical and Biological Engineering (AIMBE)
- 2019 Distinguished Alumni Award, College of Engineering—Guindy (India) [225th Anniversary Year]
- 2019 Best paper award at Behavioral, Economic, and Socio-Cultural Computing (BESC) 2018 for "Distinguished Research on Digital Humanities"
- 2018 Winner, Gold-standard Emotion Sub-Challenge, ACM Audio-Visual Emotion Challenge – AVEC'18
- 2018 Fellow, Association for Psychological Science for "sustained and outstanding distinguished contributions to psychological science"
- 2018 ISCA Best Journal Paper Award (for Li, Han, Narayanan "Automatic speaker age and gender recognition using acoustic and prosodic level information fusion" published in Computer Speech and Language 2013)
- 2018 VAJRA Faculty, Indian Institute of Technology-Madras
- 2018 Senior Research Award, USC Viterbi School of Engineering
- 2017 Willard R. Zemlin Lecture, American Speech-Language-Hearing Association
- 2017 Fellow, National Academy of Inventors
- 2016 Fellow, International Speech Communication Association for "contributions to speech communication science and technologies and their human-centered engineering applications."
- 2016 Co-Author, Best student paper award, Interspeech (with Tanner Sorensen)
- 2016 Co-Author, Best student paper award, ICASSP (with Zhaojun Yang)
- 2016 Co-Author, Winning paper on the sentiment analysis twitter challenge SemEval/NAACL 2016
- 2016 Google Faculty Research Award
- 2016 Use-inspired Research Award, USC Viterbi School of Engineering
- 2015 Distinguished Engineering Educator Award, Engineers Council
- 2015 Distinguished Lecturer, International Speech Communication Association (ISCA)
- 2015 Interspeech Computational Paralinguistics Challenge Award, Nativeness Degree Estimation in Speech
- 2014 Ten-year Technical impact award, ACM International Conf Multimodal Interfaces, 2014
- 2014 Interspeech Computational Paralinguistics Challenge Award, Cognitive Load Estimation from Speech
- 2014 Co-author on two Northern Digital Excellence Award Papers, International Seminar on Speech Production'14 (with V. Ramnarayanan and with J. Kim)
- 2013 Interspeech'13 Paralinguistics Challenge Award, Social Signals (with R. Gupta, K. Audhkhasi, S. Lee)
- 2013 Co-author, Best student paper (C. Vaz, V. Ramnarayanan), ISCA Interspeech'13.
- 2012 Interspeech'12 Speaker Trait Challenge Award, Pathology (with J. Kim, N. Kumar, A. Tsiartas, M. Li)
- 2011 UCLA School of Engineering, Alumni Professional Achievement Award
- 2011 Interspeech'11 Speaker State Challenge Award (with D. Bone, M. Black, M. Li, A. Metallinou, S. Lee)

2011	Co-author, Best Student Paper, Northern Digital Inc. Excellence Award (A. Lammert), International Seminar on Speech Production (ISSP)
2010	Best Paper at InterSpeech 2010, International Speech Communication Association (for Black et al, "Automatic Classification of Married Couples' Behavior using Audio Features")
2010	IBM Faculty Award
2010	Distinguished Faculty Service Award, USC
2010	IEEE Signal Processing Society Best Paper Award (for Lee & Narayanan, "Toward detecting emotions in spoken dialogs" published in IEEE Trans. Speech and Audio Processing)
2010	Fellow of AAAS for "outstanding contributions to human communication science and technologies and their applications to engineering systems development."
2010	Distinguished Lecturer of the IEEE Signal Processing Society (2010-2011)
2009	Fellow of IEEE for "contributions to human-centered multimodal signal processing and applications"
2009	InterSpeech'09 Emotion Challenge Award (with C-C. Lee, E. Mower, C. Busso, S. Lee)
2009	Best Paper Award, IEEE International Conference on Distributed Computing in Sensor Systems
2009	Body Computing Conference, BodySlam Award
2008	IBM Faculty Award
2008	Okawa Foundation Research Award
2007	Co-author, Best student paper (J. Shin), IEEE Multimedia Signal Processing Workshop 2007.
2006	President, Phi Kappa Phi Academic Honor Society, USC Chapter
2006	IEEE Signal Processing Society Best Paper Award (for Narayanan & Potamianos, "Creating Conversational Interfaces for Children" published in IEEE Trans. Speech and Audio Processing)
2006	Co-author, best student paper (S. Sundaram), IEEE Multimedia Signal Processing Workshop 2006.
2006	Mellon Award for Excellence in Mentoring, USC
2005	Fellow of Acoustical Society of America (for "contributions to speech production and imaging")
2005	Acoustical Society of America, "Hot topics" invited speaker (speech production)
2005	The Northrop Grumman High Visibility Research Award, USC Electrical Engineering
2005	Co-author, best student paper (S. Ananthakrishnan), IEEE ICASSP 2005.
2003	Faculty fellow, Phi Kappa Phi
2003	USC Engineering Junior Faculty Research Award
2003	Faculty Fellow, USC Provost Center for Interdisciplinary Research
2003	NSF CAREER award
2002	ISCA Best Student Paper, Second Place ICSLP 2002 (graduate student J. Shin & undergraduate student, A. Kazemzadeh).
2000,1997	AT&T Performance Award
1999,1996	AT&T True Achievement Award
1994,1993	Vinnell Foundation Fellowship, Anthony Fellowship
1990-1991	DEED Scholarship, American Public Power Association

Professional Memberships:

- Fellow, Acoustical Society of America (ASA)
- Fellow, Institute of Electrical and Electronic Engineers (IEEE) – Signal Processing Society
- Fellow, American Association for the Advancement of Science (AAAS)
- Fellow, International Speech Communication Association (ISCA)
- Fellow, Association for Psychological Science
- Fellow, American Institute for Medical and Biological Engineering (AIMBE)
- Fellow, National Academy of Inventors
- Fellow, Association for the Advancement of Affective Computing (AAAC)
- Member, Association for Computing Machinery (ACM); American Association for Engineering Education; Linguistic Society of America; International Phonetics Association
- Member, Tau Beta Pi, National Engineering Honor Society; Member, Eta Kappa Nu, National Electrical Engineering Honor Society; Phi Kappa Phi Academic Honor Society

Key Editorial Services:

2007-present	Editor, Computer, Speech and Language Journal, Elsevier
2016-2018	Editor in Chief, IEEE Journal of Selected Topics in Signal Processing
2011-2020	Editorial Board, APSIPA Transactions on Signal and Information Processing, Cambridge Univ. Press

2014-2016	Associate Editor, IEEE Transactions on Signal and Information Processing over Networks
2009-2016	Associate Editor, The Journal of the Acoustical Society of America, American Institute of Physics
2010-2016	Associate Editor, IEEE Transactions on Affective Computing
2011	Guest Editor, EURASIP Journal on Advances in Signal Processing
2011	Guest Editor, ACM Transactions on Audio, Speech and Language Processing
2008-2012	Associate Editor, IEEE Transactions on Multimedia
2006-2008	Associate Editor, IEEE Signal Processing Magazine
2006	Area Editor, Speech Synthesis, Handbook on Speech Processing, Springer
2002	Editorial Board, IEEE Trans. on Speech and Audio Processing, Spontaneous Speech Special Issue
2000-2004	Associate Editor, IEEE Transactions on Speech and Audio Processing

Key Professional Society Services:

2020-22	Vice President (inaugural), Education, IEEE Signal Processing Society
2023	Technical Program Co-Chair, ICASSP, Rhodes, Greece
2023	Plenary Co-Chair, ICIP, Kuala Lumpur, Malaysia
2018	General Co-Chair, Interspeech-Hyderabad, India
2018	Technical Area Chair, IEEE International Conference on Biometrics
2018	Co-Chair, First Workshop on Multimedia Analytics on Societal Trends (MAST)
2017	Plenary Co-Chair, EUSIPCO, Kos, Greece
2016	Technical Program Chair, IEEE Multimedia Signal Processing Workshop, Montreal, Canada
2016	Technical Program Chair, Interspeech-San Francisco, USA
2014	Publications Chair, IEEE Spoken Language Technology Conference
2014	Technical Area Chair, ACM International Conference on Multimodal Interaction
2013	Co-Organizer, Dagstuhl Seminar on Computational Audio
2012	General Co-Chair APSIPA Annual Summit and Conference
2012	Technical Special Session Chair, Interspeech 2012
2012	Technical Area Chair, ACM International Conference on Multimodal Interaction
2010	Technical Program Co-Chair APSIPA Annual Summit and Conference
2009	Technical Program Co-Chair HLT-NAACL Conference
2009	Technical Program Co-Chair IEEE ASRU
2009	General Co-Chair, Second International Workshop on Children, Computer and Interaction
2007	General Co-Chair, IEEE Multimedia Signal Processing Workshop
2004-2007	Speech Processing Technical committee – IEEE Signal Processing Society (Policy subcommittee)
2005-2008	Multimedia Signal Processing Technical committee – IEEE Signal Processing Society
2001-present	Technical committee - Speech Communication, Acoustical Society of America
2002-2014	ASA Committee on Standards Ex-officio member
2008	Co-chair, Registration, ICASSP 2008
2004	Publicity Chair, NAACL/Human Language Technology Conference (HLT)
2004	Sensory Information Processing Area Co-Chair, Intl Conf. Multimodal Interfaces (ICMI)
2003	Technical Program Chair, IEEE Automatic Speech Recognition and Understanding, Virgin Islands
2003	Workshop Technical Program Committees: SigDIAL; Multimodal User Authentication
2003	Education and Member subcommittee, IEEE Signal Processing Society Speech committee
2002	Technical Program Co-Chair, IEEE Speech Synthesis Workshop
2002	Tutorials Chair, International Conf. Spoken Language Processing
2002	Area Chair, Multilingual Processing, International Conf. Spoken Language Processing
2002	Special Session Chair, “Features and Models for Speech”, Acoustical Soc. of Am. Meeting
2002	Co-Chair, Human-Machine Interface Track, International Conf. on Multimedia

Review Services:

- National Academies (National Research Council) Technical Review Board for Army Research Labs
- National Science Foundation
- National Institutes of Health (NIDCD Study Section member 2008-11, Language Communication);
- Israel Science Foundation; Irish Research Council for Science, Engineering and Technology, Indo-US Foundation, Science Foundations of Finland, France, Belgium, EU
- Several IEEE Transactions: Audio, Speech and Language Processing; Automatic Control; Signal Processing Letters; Multimedia; Medical Imaging; Signal Processing; Education

- Journal of the Acoustical Society of America; Speech Communication Journal
- Journal of the International Phonetic Association ; Journal of Speech and Hearing Research
- Several conferences including ICASSP, ICSLP, IJCAI, ACC, ICME, HLT, Interspeech and ASRU.

Sponsored Research Projects at USC (09/2000-present):

SPONSOR	ROLE	TITLE	DATES
DARPA NEAT (Neural Evidence Aggregation Tool) Program	PI	PRECOG: Multimodal integration of neural and biobehavioral signals for predicting preconscious responses	2023-2026
NSF (Medium)	PI	Structured variability in vocal tract articulation dynamics in speech	2023-2027
Simons Foundation Autism Research Initiative (SFARI)	MPI	Multimodal, objective assessment of the ASD phenotype: Longitudinal stability and change across contexts	2023-2026
NSF	Co-PI	CompCog: Deep causal inference grounds the perception of cognitive objects in speech	2023-2026
NSF CIVIC Innovation	Co-PI	Everyday Respect	2023-2026
NIH R01/NIA	Investigator	Multilingualism as a factor of resilience to Alzheimer's disease and related dementias in India	2023-2028
IARPA HIATUS	Co-PI	SADIRI: Stylometric Authorship Discernment and Interpretation for Realistic Inputs	2022-2026
NSF Smart Connected Health	Co-PI	Detecting and mapping stress patterns across space and time: Multimodal modeling of individuals in real-world physical and social work environments	2022-2026
Walt Disney Company	PI	AI Conversational Interactions	2022-2024
Toyota	PI	EDA and Sensor Fusion for Fatigue/Affective State Detection	2022-2024
DARPA	Co-PI	Early Detection of Influence Indicators with Machine Intelligence	2021-2024
Apple	PI	Using Automated Methods to Classify Language Ability in Children with Autism	2021-2022
Amazon-USC Center	PI	Federated Learning for Human-centered Experience and Perception Modeling with Biobehavioral Data	2021-2023
Disney Research	PI	Speech Quality Estimation for ASR	2021-2022
Amazon	PI	Toward Inclusive Human-AI Conversational Experiences for Children	2020-2021
IEEE	PI	IEEE Signal Processing Society - USC STEM K-12 Education Outreach Initiative	2021-2022
Google	PI	Computational Media Intelligence	2019-2021
DARPA	Co-PI	Learning Robust Representations	2020-2023
Simons Foundation	PI	Toward creating Behavioral Informatics for ASD through Rich and Efficient Audio Processing	2019-2021
NIH/NIAAA R56	Multi-PI	Technology-supported training and quality assurance for psychosocial interventions	2019-2021
Geena Davis Institute	PI	Computational Approaches in Support Diversity and Inclusion	2019-2020
DARPA LORELEI	Co PI	Exploiting Language Information for Situational Awareness	2015-2021
IEEE	PI	USC STEM K-12 Education Outreach Initiative	2021-22
Simons Foundation		Evaluating BOSCC and ELSA as Outcome Measures in the Context of a JASPER Intervention Trial	2019-2024
NSF	Co PI	MRI: Development of a High-Performance Low-Field MRI for Dynamic Imaging	2018-2023
Applied Physics Lab JHU	PI	DeepRASD: Deep learning for Robust and Adaptive Speaker Detection	2018-2020
IARPA/MOSAIC	PI	TILES: Tracking Individual performance with Sensors	2017-2021
NSF	CoPI	Human-Building Integration: Bio-Sensing Adaptive Environmental Control for Human Health and Sustainability	2017-2020
NIH R01/NIMH (with Weill Cornell Medical College)	Investigator (USC PI)	Unpacking treatment mechanisms: Combining evidence from three early intervention models for Autism Spectrum Disorder (ASD)	2017-2022
NIH R01/NIMH (with UCSF)	Investigator (USC PI)	Development of a Standardized Measure of Social Communicative Abilities for Children with Neurodevelopmental Disorders	2017-2022
CDC (with Arizona State/ Northwestern))	USC PI	Testing a Family-Based Preventative Intervention on Childhood Obesity in Primary Care	2016-2018

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NIH R01/NIAAA (with U Washington, Utah)	MPI	Implementation of Technologically-Based Evaluation of Motivational Interviewing	2016-2021
NSF	Co PI	Dating Couple Aggression: Using Mobile Technology to Assess Emotions, Vocalizations, and Physiology	2016-2019
NSF	Co PI	The Degree of Synchrony Across Physiological and Behavioral Indicators in Aggression	2016-2018
NSF	PI	Emotionally immersive tele learning	2016-2017
Google Faculty Award	PI	Enabling Affect Sensitive Experiences	2016-2017
NIH R01	PI	Dynamics of vocal tract shaping	2015-2020
NSF	PI	Understanding Individual Variability	2015-2019
DARPA RATS (with SRI)	USC PI	Robust Automatic Transcription of Speech	2015-2016
DoD	Co PI	Technologies for Assessing Behavioral and Cognitive Markers of Suicide risk	2015-2019
Simons Foundation	Co PI	Developing Scalable Measures of Behavior Change for ASD treatments	2015-2018
NIH/NIDCD R01	Co Investigator; USC PI	Verbal/non-verbal asynchrony in adolescents with high-functioning Autism	2013-2017
Geena Davis Institute/ Google Foundation	PI	Rich and Efficient Media Content Processing	2013-2018
IBM	PI	Social Media Informatics	2012-2014
NIH/NICHHD R21	Co Investigator	Family Violence and Young Adult Dating Aggression: Reactivity and Compassion	2012-2014
NIH/NIDA R34	Co Investigator; USC PI	Development and feasibility of computer based fidelity monitoring for MI	2012-2015
NIH/NIDCD R01	Co Investigator	Speech Prosody and Articulatory Dynamics in Spoken Language	2012-2017
DoJ/MIT Lincoln Laboratory	PI	Data collection and Analysis of vocal tract MRI	2012-2015
IARPA/IBM BABEL Project	Co PI	Lorelei Consortium	2012-2016
ONR/BAE Systems	PI	Expeditionary Maneuver Warfare and Combating Terrorism: Basic and Applied Research	2012-2014
Army Research Office	PI	TATRC: Advancing Speech Recognition Technology to Support Training with Virtual Humans	2011-2014
NSF (NeTS Large)	Co PI	Exploration and Exploitation in Actuated Communication Networks	2012-2017
NSF (Medium)	Co PI	Quantitative Observational Practice in Family Studies: The case of reactivity	2011-2014
NSF (Small)	Co PI	Emotional Speech Production: Analysis, Modeling and Synthesis	2011-2015
DARPA (with BBN) BOLT Project	USC PI	Broad Operational Language Translation	2011-2014
DARPA (with IBM) RATS Project	USC PI	Targeted Robust Audio Processing (TRAP) System	2011-2014
ARL	CoPI (USC PI); collaborative research: Cogent	Improving Accuracy, Speed and Usability of Multi-Modal Biometric Handheld Devices	2009-2012
NSF (Large)	USC PI (collaborative research)	Be A Scientist	2010-2015
NIH/NIDCD R01 (through Haskins Labs)	Co Investigator	Variability and Error in Speech Production	2012-2013
NIH/NIAAA R01	USC PI; collaborative research: UWashington, UCI	Automating Behavioral Coding via Text-mining and Speech Signal Processing	2010-2015
NIH/NHLBI, R01	Co Investigator	Model-based Phenotyping of OSAS in Pediatric Obesity using Dynamic MR Imaging	2010-2014
DARPA	PI	Healing Heroes: Behavioral Signal Processing for PTSD	2011-2014
NSF (Expeditions in Computing)	PI (USC); collaborative research: GeorgiaTech, UIUC, MIT, BU, CMU	Computational Behavioral Science: Modeling, Analysis, and Visualization of Social and Communicative Behavior	2010-2015
NIH R01/NIDCD	PI	Dynamics of vocal tract shaping	2010-2016
ONR/BAE Systems	PI	Speaker Segmentation and Emotion Detection from Speech	2010-2011
NSF (Large)	PI	An Integrated Approach to Creating Context Enriched Speech Translation Systems	2009-2015
ONR	Co PI	Intelligent Coordination and Adaptive Classification for Naval Autonomous Systems	2009-2014

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DARPA (sub to BAE)	PI	DeepGreen Phase II	2009-2010
Los Angeles Basin Clinical Translational Sciences Institute	Co PI	Translating automated bidirectional translation technologies to clinical settings	2009-2010
Army Research Labs	Co PI	Multimodal Biometrics	2009-2012
NIH/NIMH (ARRA)	Co Investigator	Disseminating Scientific Information about Autism to the Latino Community	2009-2011
Army	Co PI	Virtual Humans Research	2009-2011
DARPA	PI	SpeechLinks: Speech Translation for Tactical Communication	2006-2010
Fund for Innovative Undergraduate Teaching	PI	Engineers as Teachers	2009-2010
Army Research Office	Co PI	Virtual Sick Call	2009-2010
ONR	Co PI	INOTS: Interactive Naval Officer Training System	2009-2010
NSF	USC PI; Partner: Georgia Tech	Collaborative Research: Modeling Creative and Emotive Improvisation In Theater Performance	2008-2011
Army Research Office	Co PI	Joint Fires and Effects Trainer System	2008-2009
Autism Speaks	PI	Speech Processing Technology for the Facilitation of Social Communication Training in Children with Autism	2008-2010
NSF	PI Narayanan	Exploring Emotional Vocal Productions through the use of Real-time Magnetic Resonance Imaging	2008-2010
NIH	Co PI	Mobile Device Biomonitoring to Prevent and Treat Obesity in Underserved Minority Youth	2008-2010
NSF	PIs: Mataric, Narayanan	Personalized Socially-Assistive Human-Robot Interaction: Applications to Autism Spectrum Disorder	2008-2013
Qualcomm	PI	Mobile Metabolic Health Monitoring	2008-2009
NSF (sub to ICT)	Investigator	Responsive Virtual Human Museum Guides	2008-2011
Army Research Office	Co-PI	Gunslinger: Virtual Humans in a Kinetic Environment	2007-2008
DHS	Co-PI, Hovy, PI	Center for Knowledge and Information Discovery	2007-2012
Army	PI	Virtual Humans-Natural Language	2007-2009
Army	PI	Tactical Questioning	2006-2008
NSF CRI	Investigator; PI Mataric	Human-Robot Interaction and Socially Assistive Robotics	2007-2008
NSF MRI	Investigator; PI Schaal	Humanoid Robots	2006-2008
Annenberg Center	PI	Emotions in Speaking and Singing	2006-2007
Provost Undergraduate Fund	Co-PIs: Byrd, Narayanan	Speech Production Modeling	2006
Zumberge Interdisciplinary Award	Co-PI; PI Zimmermann	Tele-rehabilitation	2006-2007
NIH R01/NIDCD	Co-I; Byrd, PI	Prosody and Articulatory Dynamics in Spoken Language	2006-2011
ONR	Co-PI; PI B. Mel	Bioinspired audiovisual processing	2006-2009
MURI – ONR U Wash, Stanford, USC	USC PI ;co PI, Byrd	Human-like speech processing	2005-2010
NIH R01	PI	Dynamics of vocal tract shaping	2005-2009
AT&T	PI	Multilingual processing	2005-07
Dept. of Interior/DARPA	PI	User interface for speech translation	2005-07
School of Social Work	Co-PI; PI Trickett	Planning grant for infrastructure creation for child social service research	2005-06
NSF ITR Collaborative Research (UCLA-UCB-USC)	USC PI; project director A. Alwan, UCLA	“Automating Early Assessment of Academic Standards for Very Young Native and Non-Native Speakers of American English”	2003-2007
ARDA VACE	Co-Investigator; PI Nevatia	“Multimodal Speaker Identification”	2004-05
Sandia Labs	PI	“Multimodal systems”	2004-2005
LASER ACTD	PI	Training for Speech Translation	2004-2005
Army Science Conference	Investigator	Interactive Virtual Soldier System	2004
Freedom Forum	Investigator; ICTsubcontract	“Newseum: Be a Reporter”	2003-2004
Provost Undergraduate Research Fund	with E. Andersen	“Cross-Cultural Issues in Child-Machine Interactions	2003-2004

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Provost Undergraduate Research Fund	with D. Byrd	“Toward Illuminating Fine Details in Human Speech Production: Investigations of Vocal Tract Movements”	2003-2004
Center for Interdisciplinary Research	Fellow	“Multimodal-Multilingual Communication Technologies”	2003-2004
Pratt & Whitney Institute for Collaborative Engineering	PI; co-PIs Helmy, Lee, Ortega, Zimmerman	“Wireless Mobile and Distributed Networking System for Efficient Aircraft Engine Inspection and Maintenance”	2003-2006
ONR/DARPA	co-PI; Lewis Johnson, PI	“Training Superiority: Rapid Development of Mission-Oriented Communication Skills”	2003-2005
NSF CAREER award	PI	“Modeling and Optimizing User-Centric Mixed-Initiative Spoken Dialogue Systems”	2003-2009
Provost Undergraduate Research Fund	co-PIs D. Byrd, E. Andersen	“Monolingual and Bilingual Spoken Language Interactions of Preschoolers”	2002-2003
NIH R01	co-PI; Byrd, PI	“Prosody and Articulatory Dynamics in Spoken Language”	2002-2007
NSF ITR	PI, co-PIs E. Chew, C. Kuo	“Content Based Query and Retrieval of Music Using Signal Processing and Knowledge-Based Methods”	2002-2005
DARPA Babylon/CAST Project	PI	“Multilingual Speech to Speech Translation Systems”	2002-2005
US Army/STRICOM	PI	“Robust Speech Recognition for Immersive Training”	2001-2004
US Army	joint PI with L. Johnson	“Expressive Speech Synthesis for Animated Characters in Training Applications”	2002-2004
Acorn Technologies	PI	“Robust Speech Processing”	2002
ALI Microelectronic Corp	PI	“Processing and Retrieval of Music”	2002
Lockheed Martin	PI	“Multimodal Speech Interfaces”	2001-2002
Lucent Technologies	PI	“Speech Interfaces for Mobile Devices”	2001
Zumberge Interdisciplinary Grant	co-PIs: Andersen, McLaughlin	“Investigations Into Preschool Children Interacting with Machines”	2002-2003
USC Arts Initiative	PI: M. Lazzari; co-PIs: Breisch, McLaughlin, Narayanan	Tactile experiences for Arts	2002-2003
Provost Undergraduate Research Fund	co-PIs: Andersen, Byrd	“Analysis of Child-Machine Spoken Dialogues”	2002
NSF-ERC Integrated Media Systems Center	Co-PI with several USC investigators	Integrated Media Systems Center	2000-2008
Powell Foundation	PI	“Speech Analysis and Interpretation Lab Set-Up”	2000-2002

Invited Talks:

Aug 2023	Opening Keynote, Interspeech, Dublin Ireland, 2023
July 2023	Distinguished Speaker, Computer Science Distinguished Seminar, University of Houston, Texas
July 2023	Invited Speaker, 16th International Symposium on Signals, Circuits and Systems (ISSCS), Romania
Mar 2023	Keynote, IEEE VR 2023 Workshop on Multi-modal Affective and Social Behavior Analysis and Synthesis in Extended Reality, hybrid: Shanghai/Online
Mar 2023	Invited Talk/Panel, AAAS Meeting. Improving Mental Health and Supporting Self-regulation with Technology, Washington DC
Feb 2023	Keynote, Language-Based AI Agent Interaction with Children@IWSDS'23, Los Angeles, CA
Nov 2022	Keynote, 24th International Conference on Speech and Computer (SPECOM 2022)
Nov 2022	Keynote, 3rd Workshop on Bridging Social Sciences and AI for Understanding Child Behavior, ICMI
Oct 2022	Plenary lecture, 30th Brazilian Congress of Speech and Language Pathology
Oct 2022	Invited talk, Rethinking Technology for Mental Health and Wellbeing Workshop, Microsoft
July 2022	Keynote, International Conference on Imaging, Signal Processing and Communications (ICISPC)
July 2022	Invited talk, Emotions in Organizational and Social Media Communication, ISRE Wksp, Los Angeles
July 2022	Keynote, CLPsych: Workshop on Computational Linguistics and Clinical Psychology, NAACL/Seattle
July 2022	Invited talk, Society of Psychotherapy Research, Denver
June 2022	Invited talk - Expert Session, ICASSP, Singapore
Mar 2022	Plenary Lecture, AAAI Spring Symposium: Designing AI for Open Worlds
Feb 2022	Invited talk, University of Miami, Institute for Data Science & Computing
Oct 2021	Invited talk, UCLA Center for Language, Interaction, and Culture
July 2021	Plenary lecture, National Conference on Communications (NCC), 2021, India
June 2021	Invited Talk, Royal Institute of Technology (KTH), Stockholm

Mar 2021 Virtual Workshop on Machine Learning for Health, Apple
 Oct 2020 Keynote, ACM International Conference on Multimodal Interaction (ICMI 2020) Utrecht, Netherlands
 Aug 2020 Invited talk, DoD Interagency Wearables Summit
 Feb 2020 Keynote, Signal Analytics Workshop-Conference on Motor Speech, Santa Barbara, CA
 Feb 2020 Invited talk, Amazon, Seattle WA
 Nov 2019 Distinguished Lecture in Computer Science & Engineering, Texas A&M University
 Sept 2019 Keynote talk, Speech Music and Mind 2019, Vienna, Austria
 Sept 2019 Keynote talk, 5th International Workshop on Affective Social Multimedia Computing, Cambridge, UK
 Sept 2019 Plenary Speaker, International Congress on Acoustics, Aachen, Germany
 June 2019 Keynote talk, AFEKA Speech Processing Conference 2019, Tel Aviv, Israel
 Dec 2018 Invited talk, SOUND Workshop on Predicting Social Structure from Audio, Bar-Ilan University, Israel
 Oct 2018 Keynote talk, ACM International Conference on Multimodal Interaction (ICMI 2018) Boulder, CO
 Sept 2018 Keynote talk, Machine Learning in Speech and Language Processing Workshop, Google-India
 Sept 2018 Invited talk, College of Engineering, Guindy-Anna University, Chennai, India
 Sept 2018 Invited talk, Jawaharlal Nehru University (JNU), New Delhi, India
 Sept 2018 Invited talk, International Institute of Information Technology (IIIT), Bangalore, India
 July 2018 Keynote talk, IEEE International Conference on Multimedia & Expo, San Diego, CA
 July 2018 Distinguished Lecture in Medical Engineering, Jet Propulsion Laboratory, CA
 June 2018 Grand Rounds Talk, Neurosurgery, Loma Linda University Medical Center
 May 2018 Keynote talk, First Affective Computing and Intelligent Interaction-Asia, Beijing, China
 Jan 2018 Virtual Grand Rounds, Prevention Science & Methodology Group, Northwestern University, Evanston
 May 2017 Invited talk, Center for Technology and Behavioral Health, Dartmouth College, Hanover, NH
 Mar 2017 Invited talk, NIH Workshop on "Biometrics and Beyond", NIMH, Bethesda, MD
 Dec 2016 Keynote Lecture, 16th Speech Science and Technology Conference (SST2016), Australia
 Dec 2016 ISCA Distinguished Lecture, University of New South Wales, Sydney, Australia
 Dec 2016 ISCA Distinguished Lecture, University of Auckland, Auckland, NZ
 Nov 2016 Distinguished Lecture, Electrical and Computer Engineering, Johns Hopkins University, Baltimore
 Oct 2016 Keynote, ROCLING 2016 Taiwan Conf. on Computational Linguistics and Speech Processing, Taiwan
 Oct 2016 ISCA Distinguished Lecture, National Tsing Hua University, Hsinchu, Taiwan
 Oct 2016 ISCA Distinguished Lecture, National Taiwan University, Taipei, Taiwan
 July 2016 ISCA Distinguished Lecture, Indian Institute of Technology, Madras, India
 July 2016 ISCA Distinguished Lecture, Summer School on Speech and Audio Processing, Ahmedabad, India
 July 2016 ISCA Distinguished Lecture, Indian Institute of Technology, Bombay, India
 July 2016 ISCA Distinguished Lecture, Indian Institute of Science, Bangalore, India
 June 2016 Distinguished Lecture, Universidad Politécnica de Madrid (UPM), Madrid, Spain
 June 2016 Distinguished Lecture, Universidad Carlos III de Madrid, Madrid, Spain
 June 2016 Keynote Lecture, Odyssey2016-The Speaker and Language Recognition Workshop, Bilbao, Spain
 Feb 2016 Distinguished Human Language Technology Lecture, CSAAIL, MIT, Cambridge, MA
 Nov 2015 Invited Talk, TCS Innovation forum, San Jose, CA
 October 2015 Keynote Lecture, Oriental COCODA, Shanghai, China
 October 2015 ISCA Distinguished Lecture, University of Science and Technology, Hefei, China
 May 2015 Invited Lecture, Technical University, Berlin, Germany
 May 2015 ISCA Distinguished Lectures, Koc University, Bogazici University, Istanbul, Turkey
 April 2015 Invited talk, ICASSP, Brisbane Australia
 April 2015 Invited talk, Macquarie University, Sydney, Australia
 March 2015 Distinguished Lecture, Carnegie Mellon University, Pittsburgh
 Jan 2015 Distinguished Lecture, Centre of Excellence in Signal Processing, IIIT, Hyderabad, India
 Jan 2015 Invited Lectures, Winter School on Speech and Audio Processing, Ahmedabad, India
 Nov 2014 Distinguished Lecture, Electrical & Computer Engineering Department, Rutgers University
 Oct 2014 Distinguished Lecture in Computing, Instituto Tecnológico Autónomo de México (ITAM), Mexico
 Sept 2014 Keynote Lecture, Workshop on Speech, Language and Audio in Multimedia (SLAM 2014), Malaysia
 Sept 2014 Invited Lecture, Workshop on Formalizing Dialogue Genres for Efficient Virtual Character Creation
 June 2014 Distinguished Lecture, Instituto Superior Técnico, Lisbon, Portugal
 May 2014 Invited Lecture, Autism Center of Excellence Workshop, Emory University, Atlanta
 Dec 2013 Keynote Lecture, Symposium on Pathways to Clinical Forecasting, Long beach, CA
 Oct 2013 Keynote Lecture, SSPNet Workshop on Conflict and Communication, Rome, Italy
 Aug 2013 Keynote Lecture, ISCA Workshop Speech Production in Automatic Speech Recognition, Lyon, France

May 2013 Plenary Lecture, NSF Workshop on Automatically Annotated Repository of Digital Audio and Video Resources Community, Ann Arbor, MI

Apr 2013 Invited Lecture, SenSIP Center, Arizona State University

Apr 2013 Distinguished Lecture, Intelligent Systems Program, University of Pittsburgh

Feb 2013 Invited Lecture, Behavioral Imaging Seminar, GeorgiaTech

Nov 2012 Distinguished Lecture, The Universidad Nacional Autónoma de México (UNAM), Mexico City

Oct 2012 Invited Lecture, Electrical Engineering Seminar Series, UCLA

Oct 2012 Invited Lecture, NSF Workshop on Sentiment Analysis, University of Pennsylvania

April 2012 Invited Lecture, Columbia University, NY, NY

April 2012 Keynote Lecture, CREST Symposium on Human Harmonized Information Technology, Kyoto University, Japan

Mar 2012 Invited Lecture, Johns Hopkins University, Baltimore, MD

Mar 2012 Invited Lecture, Providence Tarzana Medical Center, Encino, CA

Dec 2011 Keynote, IEEE Automatic Speech Recognition and Understanding Workshop, Hawaii, HI

Nov 2011 Keynote, Social Signal Processing Workshop-ACM Multimedia, ACM'2011, Phoenix, AZ

Sep 2011 Booz Allen Hamilton Distinguished Colloquium, University of Maryland, College Park, MD

Jul 2011 Plenary Talk, International Conference on Multimedia and Expo (ICME), Barcelona, Spain

Jul 2011 Invited Talk, Telefonica Research Multimedia Workshop, Barcelona, Spain

Jun 2011 IEEE Distinguished Lecture, Princeton, NJ

Apr 2011 Distinguished Lecture in Computing, Imperial College, London

Apr 2011 Invited Lecture, Cambridge University, UK

Apr 2011 Invited Lecture, Philips Research, Eindhoven, Netherlands

Oct 2010 Invited Lectures: Chinese University of Hong Kong; Hong Kong University of Science&Technology

Oct 2010 IEEE SPS Distinguished Lecture, Hong Kong

Oct 2010 Invited Lectures: Tsinghua University, Beijing; Microsoft Research, Asia

Oct 2010 Keynote, International Conference on Signal Processing Beijing

July 2010 Invited lecture, 8th International Conference on Signal Processing and Communication, Bangalore

July 2010 IEEE SPS Distinguished Lecture, Hyderabad, India

July 2010 Invited Lectures, IIT Madras

May 2010 Keynote Lecture, Speech Prosody Conference, Chicago

Apr 2010 Keynote Lecture, Undergraduate Linguistics Conference, UCLA, Los Angeles

Apr 2010 IEEE SPS Distinguished Lecture, University of Texas, Dallas

Apr 2010 CML Distinguished Speaker Series, University of California, Irvine

Nov 2009 University of California, Merced

May 2007 Tsinghua-USC Workshop on Emerging Technologies, Beijing

Feb 2007 Microsoft Research Seminar, Redmond, Washington

Dec 2006 Indian Institute of Science/IEEE Signal processing Society, Bangalore, India

Dec 2006 National University of Singapore-School of Computing, Singapore

Mar 2006 Indian National Academy of Sciences Seminar, IIT-Madras, India

Nov 2005 Samsung Electronics, Korea

Aug 2005 AT&T Shannon Labs, University Collaboration Seminar, Florham Park, NJ

July 2005 Cognitive Systems Workshop, Human Cognitive Models in System Design, Santa Fe, New Mexico

May 2005 Hot Topics in Speech Communication, Acoustical Society of America, Vancouver, BC

Mar 2005 Yonsei University EE Department Seminar, Seoul, Korea

Oct 2004 International Conference on Spoken Language Processing

Oct 2004 InHa University, Incheon, Korea

Apr 2004 DARPA Workshop on Speech to Speech Translation, San Diego, CA

Sept 2003 Technical University of Athens, Technical University of Crete, Greece

May 2003 Massachusetts Institute of Technology & Harvard, Cambridge, MA

Dec 2002 Cross EU-NSF ISLE Workshop, University of Edinburgh, Scotland

Mar 2002 UCLA-EE Department Communications-Signal Proc. Seminar, LA, CA

Oct 2001 California Institute of Technology-EE Department, Pasadena, CA

Sept 2001 UC-Santa Barbara, ECE Department, Santa Barbara, CA

Jun 2001 Panasonic Speech Technology Labs, Santa Barbara, CA

Nov 2000 Rockwell Science Center, Thousand Oaks, CA

Oct 2000 HRL Laboratories, Malibu, CA

Mar 2000 University of Southern California, CA

Nov 1999	Boston University, Boston, MA
Nov 1998	University of California, Los Angeles, CA
May 1997	Haskins Labs/Yale University, New Haven, CT
Oct 1996	Intl. Conf. Spoken Language Processing, Philadelphia, PA
Feb 1996	SPIE Conf. Medical Imaging, Newport Beach, CA
Oct 1995	Intl. Conf. on Signals, Systems and Electronics, Monterey, CA
Jun 1995	Haskins Labs, New Haven, CT

Key University Services/USC:

- University Committee on Professional Responsibility, 2018-present
- USC Strategic Planning Subcommittee, 2016-2019
- University Committee on Academic Promotions and Tenure, 2012-2019
- Co-chair, USC Strategic Planning Subcommittee, Graduate Programs, 2010-11
- USC Academy of Polymathic Studies, Steering Committee, 2010-11; Executive Board, 2011-present
- Chair, USC University Research Committee, 2006-2009 (Co-Chaired, 2007-08); Member URC, 2010-11
- Faculty Advisory Council, USC Shoah Foundation Institute, 2008-present
- Member, USC University Research Committee, 2005-06; 2009-2012
- Academic Promotions & Tenure Committee, USC Viterbi School of Engineering, 2004-2006
- Research Area Director (Applications Research), Integrated Media Systems Center (NSF-ERC), 2001-2008
- Research Vision Leader – Communications Systems, Integrated Media Systems Center, 2002-2008
- Research Leader, Pratt & Whitney Institute for Collaborative Engineering, USC, 2003-2008
- Faculty Coordinator, Electrical Engineering Systems Teaching Assistants, 2001-2004
- Graduate Student Recruitment, Fellowship Committees, 2001-2006
- Mentor: Undergraduate Research Program, Dean's Merit Research Program for freshmen engineers
- Freshmen interviews (Presidential Scholars/Trustee Scholars)
- Interdisciplinary program in Computational Linguistics

Pre-USC Services:

- AT&T Bell Labs Intern Mentor: Several graduate, undergraduate and high school students mentored in speech and language projects (1995-2000)
- AT&T Labs PhD Recruiter (1997-99)
- AT&T United Way volunteer
- UCLA Graduate Students Association: EE Departmental representative
- UCLA Minority Engineering Program Facilitator

Industry Collaborations and Partnerships (2000-present):

- Toyota; Disney Research; Amazon; Apple; Google; Lockheed International; HRL Labs; Speech works International, AT&T Research; Bell Labs-Lucent; IBM; Qualcomm; Raytheon BBN; BAE Systems; 3M Cogent Systems

Teaching and Mentoring:

Fall 2021, 2023	EE301: Linear Systems
Fall'00-02,04-05,06-07	EE519: Digital Speech Processing (<i>Course Developed</i>)
Spr 10, Fall 10,11,12,	Graduate level course on speech signal processing.
Spr 13-21	Applications to coding, recognition and synthesis
Spr'01	EE599: Graduate Seminar on advanced topics in speech processing
Spr'02,04,05,06,07,09	EE619: Speech recognition and Spoken Language Engineering (<i>Course Developed</i>)
	Emphasis on statistical approaches
9/90 - 6/94	Teaching Associate/Fellow, UCLA.
	Undergraduate engineering courses in Electrical and Electronic circuits, Signals and Systems, Feedback Control.

POSTDOCTORAL ASSOCIATES/RESEARCH FACULTY:

- Joanna Yau, Postdoctoral Associate, Psychology, (2019-present)

- Monisankha Pal, Postdoctoral Associate, Audio Processing, (2018-2020)
- Michelle Hasan, Postdoctoral Associate, Human performance modeling, (2017-2019)
- Sajan Gouda Lingala, Postdoctoral Associate, Imaging Research, (With K. Nayak) (2014-2017)
- Benjamin Girault, Postdoctoral Associate, Graph Signal Processing, (With A. Ortega) (2016-2020)
- Daniel Bone, Postdoctoral Associate, Behavioral Signal Processing, (2016-2017)
- Asterios Toutios, Research Associate/Research Faculty, Speech Production Research, (2012-2020)
- Tanaya Guha, Postdoctoral Associate, Multimodal Signal Processing/multimedia informatics, (2013-2015)
- Maarten Van Segbroeck, Postdoctoral Associate, Robust Speech Processing, (2012-2015)
- Yoon-chul Kim, Postdoctoral Associate, Imaging Research, (K. Nayak primary supervisor) (2010-2014)
- Emily Mower, Postdoctoral Associate, Emotions Research, 2011
- Michael Proctor, Postdoctoral Associate, Speech Production, (2009-2012)
- Athanasios Katsamanis, Postdoctoral Associate, Multimodal Signal Processing, (2009-2012)
- Carlos Busso, Postdoctoral Associate, Multimodal Processing, (2008-2009)
- Matteo Gerosa, Postdoctoral Associate, Speech Recognition, (2006-2007)
- Panayiotis Georgiou, Postdoctoral Associate/Research Asst Professor, *Speech/Audio processing* (2002-2013)
- Sungbok Lee, Research Assistant Professor, *Speech Production* (2001-2019)
- Jon Nielsen, Postdoctoral Associate, *Imaging* (K. Nayak primary supervisor) (2005-2007)
- Scott Millward, Postdoctoral Associate, *User interfaces* (2004-05)

CLINICIAN-SCIENTIST FACULTY:

- Adam Frank, MD/PhD, Asst. Professor Clinical Psychiatry and the Behavioral Sciences, USC (2021-present)
- Melinda Chang, MD, Assistant Professor of Clinical Ophthalmology, CHLA/USC Roski, (2020-present)
- Anna Cushing, MD, Assistant Professor of Clinical Pediatrics, CHLA/USC, (2023-present)
- Oluwafikunmi Sobowale, MD, Assistant Professor of Psychiatry, UCLA (2021-present)
- Benjamin Van der Woerd, MD, Clinical Fellow, Otolaryngology - Head & Neck Surgery, (2021-2022)

PH.D STUDENTS GRADUATED

1. Tiantian Feng, “Foundation Model Assisted Privacy-Enhancing Computing in Human-centered Machine Intelligence”
2. Zhuohao Chen, “Spoken Language Processing in Low Resource Scenarios with Applications in Automated Behavioral Coding”. Amazon
3. Rahul Sharma, “Establishing cross-modal correspondence for media understanding”, Amazon
4. Timothy Greer, “Creating Cross-Modal, Context-Aware Representations of Music for Downstream Tasks”, Amazon
5. Nikolaos Flemotomos, “Extracting and Using Speaker Role Information in Speech Processing Applications”, Apple
6. Victor Ardulov, “Modeling and Regulating Human Interaction with Control Affine Dynamical Systems”, Amazon
7. Raghuvver Peri, “Neural Representation Techniques for Robust and Fair Speaker Recognition”, Amazon
8. Karan Singla, “Improving language understanding and summarization by leveraging auxiliary information through self-supervised for unsupervised learning”, Interactions
9. Karel Mundnich, “Learning Multi-Annotator Subjective Label Embeddings”, Amazon
10. Victor Martinez Palacios, “Computational Narrative Models of Character Representations to Estimate Audience Perception”, Apple
11. Krishna Somandepalli, “Learning Shared Subspaces across Multiple Views and Modalities”, Google
12. Arindam Jati, “Understanding sources of variability in learning robust deep audio representations”, IBM
13. Taejin Park, “Multimodal and Self-guided Clustering Approaches Toward Context Aware Speaker Diarization”, Nvidia
14. Sandeep Nallan Chakravartula, “Computational Modeling of Behavioral Attributes in Conversational Dyadic Interactions” (co-advisor Panayiotis Georgiou), Amazon
15. Prashanth Gurunath Shivakumar, “Speech Recognition Error Modeling for Robust Speech Processing and Natural Language Understanding Applications” (co-advisor Panayiotis Georgiou), Amazon
16. Shao-Yen Tseng, “Human Behavior Understanding from Language through Unsupervised Modeling” (co-advisor Panayiotis Georgiou), Intel
17. Haoqi Li, “Behavior Understanding from Speech under Constrained Conditions ---- Exploring sparse networks, transfer and unsupervised learning” (co-advisor Panayiotis Georgiou), AWS

18. Manoj Kumar, "Context-aware Models for Understanding and Supporting Spoken Interactions with Children", Amazon
19. Yongwan Lim, "Improved Real-Time MRI of Speech Production" (co-advisor Krishna Nayak), Apple
20. Brandon Booth, "Improving Modeling of Human Experience and Behavior: Methods for Enhancing the Quality of Human-produced Data and Annotations of Subjective Constructs", U Colorado
21. Pavlos Papadopoulos, "Noise Aware Methods for Robust Speech Processing Applications", Amazon
22. Tanner Sorensen, "Dynamics of Speech Tasks and Articulator Synergies", Cobalt Speech & Language
23. Nikos Malandrakis, "Generating Psycholinguistic Norms and Applications", Amazon
24. Md. Nasir, "Interaction Dynamics and Coordination for Behavioral Analysis in Dyadic Conversations", Microsoft
25. Anil Ramakrishna, "Computational Models for Multidimensional Annotations of Affect", Amazon
26. Ruchir Travadi, "Efficient Estimation and Discriminative Training for the Total Variability Model", Apple
27. Colin Vaz, "Matrix Factorization for Noise-Robust Representation of Speech Data", Amazon
28. Che-Wei Huang, "Toward Robust Affective Learning from Speech Signals Based on Deep Learning Techniques", Amazon
29. James Gibson, "Machine Learning Paradigms for Behavioral Coding", Uniphore
30. Dogan Can, "Weighted Factor Automata: A Finite-State Framework for Spoken Content Retrieval", Apple
31. Theodora Chaspari, "Knowledge-Driven Representations of Physiological Signals: Developing Measurable Indices of Non-Observable Behavior", Texas A&M University
32. Zhaojun Yang, "Analysis and Modeling of Multi-Level Dynamics of Multimodal Behavior in Affective Human Interactions", Facebook
33. Naveen Kumar, "Exploiting Latent Reliability Information for Classification Tasks", Disney
34. Rahul Gupta, "Computational methods for modeling non-verbal communication in human interaction", Amazon
35. Bo Xiao, "Modeling expert assessment of empathy through multimodal signal cues", Amazon
36. Daniel Bone, "Computational modeling of human interaction behavior towards clinical translation in autism spectrum disorder", Amazon
37. Jangwon Kim, "Emotional speech production: From data to computational models and applications", Amazon
38. Karthik Audhkhasi, "A computational framework for diversity in ensembles of humans and machine systems", Google
39. Andreas Tsiartas, "Enhancing Speech to Speech translation through exploitation of bilingual resources and paralinguistic information", SRI International
40. Vikram Ramanarayanan, "Toward understanding speech planning by observing its execution-representations, modeling and analysis", Educational Testing Service
41. Adam Lammert, "Structure and Function in Speech Production", Worcester Polytechnic Institute [USC Viterbi Best Thesis Award]
42. Angeliki Metallinou, Dynamics of multimodal emotional expressions, Amazon Labs
43. Abe Kazemzadeh, Natural language expressions of emotions, St. Thomas University, MN
44. Chi-chun Jeremy Lee, Behavioral Modeling in Interactions, National Tsing Hua University
45. Ming Li, "Joint variability modeling", Asst. Professor, Sun Yat-Sen Univ./C.M.U. Joint Institute of Engineering
46. Qun Feng Tan, "Sparse representations in pattern recognition"
47. Matthew Black, "Automating behavioral assessments", Behavioral Informatix; Farmers Insurance
48. Prasanta Kumar Ghosh, "Novel Signal Representations for Speech", Indian Institute of Science, Bangalore
49. Erik Bresch, "Dynamic models in speech production", Philips Research
50. Selina Chu, "Unstructured Audio Processing" (co-advisor C. C. Jay Kuo), JPL
51. Samuel Kim, "Audio Modeling and Indexing", IDIAP/EPFL
52. Emil Ettelaie, "Speech Translation through Classification", Data Mining Research-Reunify
53. Viktor Rozgic, "Multimodal detection and tracking", Raytheon BBN Technologies
54. Emily Mower (Provost), "Affective interactions: analysis and recognition" (co- advisor, M. Mataric), U Michigan, Ann Arbor
55. Kyu Jeong Han, "Speaker modeling methods", (Fall 2009), Ford Research Center
56. Ozlem Kalinli, "Attention-based methods in speech and audio processing", (Fall 2009), Apple
57. Joseph Tepperman, "Pronunciation modeling and assessment", (Spring 2009), Sensory Inc.
58. Jorge Silva, "Information theoretic representations and models for classification", (Fall 2008), Assoc. Prof., University of Chile [USC Viterbi Best Thesis Award]
59. Erdem Unal, "Music Information Retrieval under uncertainty: Polyphonic Music" (Spring 2008), Scientific and Technological Research Council of Turkey (TUBITAK)
60. Vivek Kumar Rangarajan Sridhar, "Prosody enriched speech translation", (Spring 2008), Apple

61. Carlos Busso, “Multimodal processing of Emotions” (Spring 2008), Professor, University of Texas-Dallas
62. Shiva Sundaram, “Data-driven methods in speech and audio processing” (Spring 2008), Amazon Labs
63. Chu Ping Liu, “Cochlear Implant Speech Processing” (jointly with Qian-Jie Fu) (Spring 2008), Logitech
64. Sankaranarayanan Ananthakrishnan, “Prosody models for speech applications” (Spring 2008), Amazon
65. Jongho Shin, “User modeling in human-machine conversations” (Fall 2007), LG Electronics/Emory Univ.
66. Murtaza Bulut, “Data-driven approaches to expressive speech synthesis” (Fall 2007), Philips Research
67. Abhinav Sethy, “Unsupervised methods for Speech and language modeling” (Spring 2007), IBM Watson
68. Chartchai Meesookho, “Collaborative Classification and Tracking of multiple targets” (with U. Mitra)
69. Dagen Wang, “Embedded Speech Systems with applications to speech translation” (Spring 2006), IBM
70. Serdar Yildirim, “Multimodal processing for child-machine interactions” (Spring 2006), Assistant Professor, Mustafa Kemal University, Turkey
71. Soonil Kwon, “Unsupervised speaker indexing” (Spring 2005), Sejong University, Seoul, Korea
72. Chul Min Lee, “Automatic Emotion Recognition from Speech and Language Information” (Fall 2004), LG Electronics
73. Naveen Srinivasamurthy, “Joint compression and classification with applications to distributed speech recognition” (jointly with A. Ortega) (2003 Fall), Qualcomm
74. Hsuan-Huei Maverick Shih, “Statistical Recognition and Theme finder for Query by Humming Systems” (jointly with C.-C. Kuo) (2003 Spring), President, BYOC/Acer, Taiwan

CURRENT PH.D STUDENTS (research topic)

- Amrutha Nadarajan
- Rajat Hebbar
- Sabyasachee Baruah
- Digbalay Bose
- Rimita Lahiri
- Kleanthis Avramidis
- Georgios Chochlakis
- Anfeng Xu
- Nicholas Mehlman
- Xuan Shi
- Aditya Kommineni
- Daniel Yang
- Kevin Huang
- Sean Foley
- Hong Nguyen
- Jihwan Lee
- Sean Foley

M.S. STUDENTS (research topic)

- Shanti Stewart “Robust speech and audio processing for security” (2022-23)
- Anirudh Sreeram “Robust speech and audio processing for security” (2021-22)
- Taruna Agrawal “Media processing” (2016)
- Prashanth Shivakumar, “Robust recognition of children’s speech” (2015)
- Andreas Zavou, “Diversity in fusion of ASR Systems” (2013)
- Thomas Murray, “Speech Translation Technologies”
- Dhaval Shah, “Audiovisual Biometrics”, (2009)
- Stephen Tobin, “Speech Production Analysis using realtime MRI” (2007)
- Farhad Farahani, “Multiresolution analysis of pitch for speaker recognition” (2005)
- Donal McErlean, “Graphical Models for Collaborative Processing in Sensor Networks” (2003)
- Alvertos Diamantopolous, “Multimodal speech interfaces” (2002)
- Jeff Haynes, “Optimization in sensor networks using genetic algorithms” (2002)

UNDERGRADUATE RESEARCH STUDENTS (research topic)

The students were funded through the undergraduate research program (NSF funded or funded by the USC Provost Research Fund), or the Dean’s Merit Research Program. Some of their work has contributed to conference publications.

- Selina Martinez

- Young-Kyung Kim
- Ben Ma
- Zane Durante
- Yanxi Li
- Sidharth Raguraman
- Frank Pol
- Pooja Nikki Bisarya
- Alexander Young
- Tvisha Gangwani
- Madelyn Douglas
- Taylor Seamans
- Maddie Mendlen
- Neha Anand
- Agnes Youn
- Rachel Alexander
- Sriram Somasundaram
- Yan Zhu
- Nimisha Patil
- Simon Berman, “Structure Function Interplay in Speech Production”, 2012 (RoseHills Foundation)
- Alex Onopa, “Multimodality in Speech Production”, 2012 (RoseHills Foundation)
- Li Hsuan Lu, “Analysis and Modeling of Speech Production”
- Leah Gum, “Creative Information Technologies”, 2012-present
- Sumukh Anand, “Human interaction modeling”, 2012-present
- Naa Adei Mante, “Speech Imaging Research”, 2011-present
- Ellen Feldman, “Emotions Research”, 2011-present
- Juanchen Li, “Affective Computing”, 2011-present
- James Li, “Multimodal Biometrics”, 2010-present
- Stephanie Aceves, “Emotion Modeling”, 2010-2011
- Michelle Dee, “Human Interaction Analysis”, 2008-present
- Ilene Raffii, “Motion capture based behavior analysis”, 2008-2010
- Jonathan Chang, “Child Machine Interaction”, 2008-2010
- Johnson Wang, “Emotions research”, 2009-2010
- David Grayson Smith, “Emotions research from multimodal perspective”, 2009-2010
- Karie Lau, “Nonverbal signals of emotion”, 2007-08
- Nathan Dahlin, “Vocal Beatbox Production Models”, 2007-08
- Jesse Hans, “Articulatory signatures of spontaneous speech phenomena”, 2007-08
- Matthew Tan, “Expressive Inging Voices”, 2007 Summer (from U California, Berkeley)
- Jeannette Chang, “Detecting Certainty in Problem Solving: Multimodal Processing”, 2006-2010
- Jeremy Chi-chun Lee, “Gesture information processing from motion capture”, 2006-2007
- Joshua Izumigawa, “Toward modeling multiperson interactions”, 2006-2007
- Celeste De Frietas, “Speech production modeling from real time MRI data”, 2006-2007
- Sharad Rao, “Audio modeling: Creating ontologies”, Summer 2005 (from U Illinois, Urbana-Champaign)
- David Hunt and Nathan Go, “Creating a novel speech production database”, 2005
- Nirali Shah, “Analysis of MRI Speech production data”, (2003-04)
- Jason Adams and Daylen Riggs, “Speech production”, (2004-05)
- Sonia Khurana, Marni Landes, Lewis Lawyer, “Children’s Interactive Multimedia Project”, (2003-04).
- Sonia Khurana and Talip Ucar, “Acoustic Analysis of Children’s speech”, (2002-03).
- Joe Tepperman, “Spoken Name Recognition”, (2002-03).
- Marni Landes, “Human factors for child machine interactions”, (2002-03).
- Abe Kazemzadeh, “Analysis of user behavior in spoken dialogs”, (2000-02). *Honor’s Thesis: Towards biological models for Linguistics: Human-computer dialog analysis and protein folding*
- Sudha Arunachalam (Neuroscience) and Dylan Gould (Linguistics), “Politeness and frustration language in child-machine interactions (2000-01)
- Joshua Katz (Annenberg) and Sonia Khurana (EE), “Experimental design and tools for investigating preschoolers talking to machines” (2001-02)
- Dylan Gould (Linguistics) and Ryan Cunningham (EE), “Design and collection of data for expressive speech synthesis” (2001-02)

- Ahmet Certen (EE) and Unal Erdem (EE), “Signal Analysis and User modeling for Query by Humming Systems”, (2001-02)
-

VISITING RESEARCH STUDENTS

- Sergi Hernanz, Technical University of Catalunya, Barcelona, 2004, “Robust Speaker Recognition” (Diploma Thesis)
- Matteo Gerosa, IRST/University of Padova, 2005, “Modeling and recognizing children’s speech (Ph.D)
- David Suunderman, Siemens, Germany, 2005, “Signal transformation for synthesis” (Ph.D.)
- Michael Grimm, Karlsruhe University, 2005, “Emotions in speech” (Ph.D.)
- Andreu Fernandez, Technical University of Catalunya, Barcelona, 2006, “Error propagation and models for speech recognition” (Diploma Thesis)
- Arthur Pouzet, “Speech Imaging and Acoustic Modeling”, 2006
- Tsuneo Kato, “Articulatory information driven Speech recognition”, KDDI/Japan, 2007-08
- Jorge Gilabert, “Spanish English Speech to Speech Translation”, University of Catalunya, Barcelona 2007-2008
- Carlos Molina, “Novel methods for speech assessment”, University of Chile, 2008 (Ph.D.)
- Chi-Sang Jung, “Speech Biometrics”, Yonsei University, 2009-10 (Ph.D.)
- Ozan Cakmak, “Affective computing form text”, Mustafa Kemal University, Turkey, 2011

Shrikanth (Shri) Narayanan**Peer-reviewed Publications and Patents**

Available at: <https://sail.usc.edu/publications/sorted-by-date/>

Google Scholar Link: <https://scholar.google.com/citations?user=8EDHmYkAAAAJ>

Journal Articles

1. Melinda Y. Chang, Gena Heidary, Shannon Beres, Stacy L. Pineles, Eric D. Gaier, Ryan Gise, Mark Reid, Kleanthis Avramidis, Mohammad Rostami, Shrikanth Narayanan. Artificial Intelligence to Differentiate Pediatric Pseudopapilledema and True Papilledema on Fundus Photographs. *Ophthalmology Science*. 2023
2. Adam C Frank, Ruipei Li, Bradley S Peterson, Shrikanth S Narayanan. Wearable and Mobile Technology in the Evaluation and Treatment of Obsessive-Compulsive Disorder: A Scoping Review. *JMIR Mental Health*. 10, e45572. 2023
3. Kelly White, Samuel Tate, Ross Zafonte, Shrikanth Narayanan, Mattias Mehl, Min Shin, Amar Dhand. SocialBit: Protocol for a Prospective Observational Study to Validate a Wearable Social Sensor for Stroke Survivors with Diverse Neurological Abilities. *BMJ Open*, 13(8), British Medical Journal Publishing Group, 2023
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13. S. Narayanan, "Emotion Recognition System." U.S. Patent No. 8,209,182, June 26, 2012 (Filed November 2006).
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18. Shrikanth Narayanan, Victor Martinez, Anil Ramakrishna, Krishna Somandepalli, Nikos Malandrakis, Karan Singla. LINGUISTIC ANALYSIS OF DIFFERENCES IN PORTRAYAL OF MOVIE CHARACTERS. U.S. Patent 10,956,679, March 23, 2021 (SEPTEMBER 20, 2018)
19. Efthymis Georgiou, Georgios Paraskevopoulos, James Gibson, Alexandros Potamianos, Shrikanth Narayanan. DEEP HIERARCHICAL FUSION FOR MACHINE INTELLIGENCE APPLICATIONS. U.S. Patent 11,862,145, January 2, 2024 (April 20, 2020).
20. Timmons, A. C., Chaspari, T., Narayanan, S. S., & Margolin, G. A Technology-Facilitated Support System for Monitoring and Understanding Interpersonal Relationships. 2017
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22. Amar Dhand, Min Shin, Mattias Mehl, Shrikanth Narayanan. Mobile Wearable Audio-Based System for Estimating Social Interaction Levels. 2021

Shri Narayanan's SAIL research reported in the public media

<http://sail.usc.edu/news.php>

<http://viterbi.usc.edu/news/research/narayanan.htm>

The interdisciplinary research led by Shri Narayanan with his SAIL members and collaborators has received, and continues to receive, wide local/national/international media attention (print, online and broadcast radio/television):

Computational Media Intelligence and Media Informatics (2015-ongoing)

The work on media content analysis and informatics related to media representations such as gender and race in films has been reported, some multiple times, (<http://sail.usc.edu/mica/news.html>) in the *New York Times*, *LA Times*, *Variety*, *The Hollywood Reporter*, *The Times of London*, *Washington Post*, *Vogue*, *NPR/KPCC*, *NBC*, *Independent*, *Press Trust of India*, among other global venues.

Music Research (2015-ongoing)

The work on understanding music content and its impact on human experiences has been featured widely including: *for work on chords and lyrics in*: Popular Mechanics, Science Daily, Silicon republic, GovTech, and Aspen Institute's 5 Best Ideas; work on *multimodal affective experiences* in MIT Technology Review.

Behavioral Informatics and Applications in Health (2008-ongoing)

The work on behavioral informatics and its application in the domain of family studies, Autism Spectrum Disorders and Addiction counseling has received broad media mention in numerous venues including *Washington Post*, *Wall Street Journal*, *Huffington Post*, *Business Insider*, *Science Today*, *Daily Telegraph*, *The Mail*, *Times of India*, *Social Work Today*,...

Mobile technologies in Health (2009-ongoing)

The work on KNOWME (<http://knowme.usc.edu/news.html>), one of the first human-centered mobile technology platforms for health applications has received attention from NBC, Fox, AP news, NY Times, Washington Post, USA Today, LA Times and other international venues.

Work on smartphone technologies for supporting human relationships has received attention from NBC, TechCrunch, CNET, IEEE Spectrum, among others (<http://sail.usc.edu/~chaspari/press.html>).

Beatboxing (2013-15; 2018)

The work on beatboxing in 2013-15 has received mention in Science update, BBC, Wired, NPR, Fox news, Popular Science, LA Times, Discovery Channel Daily Planet among other venues.

Work in 2018 received attention in NY Times, Newsweek, Popular Science, Science Friday, Live Science, Smithsonian Magazine, etc.

Speech Translation (2005-07, 2019)

The work on speech to speech translation has been reported in *Business Week*, *KCET TV*, and other print/online outlets including *Ventura County Star*, *Persian Journal*, *Clinical Window Journal* and the *Daily Trojan*. Featured in for an article on *AI and the Star Trek Universal Translator* in startrek.com

Emotion Recognition (2004-present)

The work on automatic emotion detection has been highlighted in television (*MSNBC*, *CBS*, *CNN*, *KCAL-Los Angeles*), radio (*BBC*, *Australian Broadcast Corporation*, *National Public Radio*, *Irish National Radio* and other local stations in the USA such as in Los Angeles *KPCC*, and Boston/Rhode Island) and print media (*MIT Technology Review*, *Wired*, *Newsweek*, *Financial Times of London*, *Australian Financial Review*, *Inc. Magazine*, *German Focus*, *Italian Panorama*, *Miami Herald*, *New Yorker*).

Language Training (2004-05)

The work on language training using speech recognition and virtual reality technologies has appeared on *ABC, NPR, NY Times, IEEE Intelligent Systems*.

Expressive Synthesis (2005)

National Academy of Engineering Radio (WTOP Baltimore), BBC 4 and BBC World Service, Baltimore Sun

Speech Production (2004,2008)

USC College Magazine, Medical Science News, ADVANCE for Speech-Language Pathologists & Audiologists.

Interdisciplinary Research (2004,2007,2008)

USC Daily Trojan, USC Trojan Family Magazine, USC Chronicle, USC Engineer, USC College Magazine