

Nikolaos (Nikos) Flemotomos

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RESEARCH Speech Processing, Recognition, and Understanding
INTERESTS Behavioral Signal Processing, Computational Psychotherapy

EDUCATION **Ph.D., Electrical Engineering** expected May 2022

University of Southern California, Los Angeles, CA, U.S.A.
Thesis: *Roles People Play: Leveraging Speaker Role Information in Speech Processing Applications*

M.Sc., Computer Science Aug 2021

University of Southern California, Los Angeles, CA, U.S.A.
GPA: 3.94/4.00

M.Sc., Electrical Engineering Dec 2018

University of Southern California, Los Angeles, CA, U.S.A.
GPA: 4.00/4.00

Diploma (5-years degree), Electrical and Computer Engineering Apr 2016

National Technical University of Athens, Athens, Greece
Thesis: *Robust Acoustic Features for Distant Speech Recognition*
GPA: 9.34/10.00

RESEARCH **University of Southern California**, Los Angeles, CA, U.S.A.

EXPERIENCE Signal Processing and Interpretation Laboratory (SAIL)

Graduate Research Assistant

May 2017 to present

Supervisor: Prof. Shrikanth Narayanan

- Developing computational methods to represent intersectional dimensions of identity (e.g., gender, age, social status, profession) in order to study how such dimensions affect conversational interactions.
- Leveraging speaker role information in various speech processing tasks (e.g., diarization, speech recognition).
- Leading a subgroup that develops a real-world system which, after processing recordings of psychotherapy sessions, gives feedback to the therapist. The system is used for computer-aided therapist training.

Apple, Los Angeles, CA, U.S.A. (home office)

Siri – Automatic Speech Recognition R&D Team

Machine Learning Engineering Intern

May 2021 to Aug 2021

Supervisor: Dr. Arnab Ghoshal

- Explored adaptation methods for end-to-end speech recognition.

Microsoft Research, Bellevue, WA, U.S.A.

Speech and Dialog Research Group

Research Intern

May 2019 to Aug 2019

Supervisor: Dr. Dimitrios Dimitriadis

- Worked on speaker identification and diarization in meeting scenarios.
- Proposed a novel algorithm for continuous speaker identification based on memory-augmented neural networks (presented at ICASSP '20).

	Czech Technical University in Prague , Prague, Czech Republic Biomedical Data and Signal Processing Group (BioDat) <i>Research Intern</i> Mar 2016 to Jun 2016 Supervisor: Assoc. Prof. Lenka Lhotska <ul style="list-style-type: none"> Developed an algorithm for automatic sleep staging from polysomnographic signals, motivated by ideas used in speech recognition.
	National Technical University of Athens , Athens, Greece Computer Vision, Speech Communication and Signal Processing Group (CVSP) <i>Undergraduate Research Assistant</i> Feb 2015 to Mar 2016 Supervisor: Prof. Petros Maragos <ul style="list-style-type: none"> Explored the Teager-Kaiser energy operator for energy estimation in speech signals. Developed a system for single-microphone distant speech recognition, comparing various acoustic feature sets, with an emphasis on those based on the AM-FM speech model.
SOFTWARE SKILLS	Programming Languages: Python, UNIX shell scripting, MATLAB, C, R Tools & Libraries: Tensorflow, PyTorch, Kaldi, OpenFST, SRILM, L ^A T _E X
GRADUATE COURSEWORK	Multimodal Probabilistic Learning of Human Communication, Advanced Natural Language Processing, Law and Intellectual Property, Computational Social Sciences, Mathematics of High-Dimensional Data, Machine Learning Theory, Deep Learning, Machine Learning from Signals, Pattern Recognition, Statistics, Probability, Random Processes, Analysis of Algorithms
TEACHING EXPERIENCE	University of Southern California , Los Angeles, CA, U.S.A. <i>Teaching Assistant</i> Spring 2019, 2020 & 2021 Speech Recognition and Processing for Multimedia Society of Astronomy and Space , Volos, Greece <i>Teaching Assistant</i> Summer 2011 & 2012 Preparation for the International Olympiad on Astronomy and Astrophysics
HONORS AND AWARDS	Myronis Endowed Ph.D. Fellowship Aug 2021 to May 2022 University of Southern California Annenberg Ph.D. Fellowship Aug 2016 to Aug 2020 University of Southern California Phi Kappa Phi initiation: May 2020 Member (academic honor society) Gerontelis Graduate Studies Scholarship Apr 2020 Gerontelis Foundation Travel Grant Sep 2018 International Speech Communication Association (ISCA) Honorable Mention Sep 2010 4th International Olympiad on Astronomy and Astrophysics
JOURNAL PUBLICATIONS	1. N. Flemotomos , V.R. Martinez, Z. Chen, T.A. Creed, D.C. Atkins, and S. Narayanan, “Automated Quality Assessment of Cognitive Behavioral Therapy Sessions Through Highly Contextualized Language Representations” (<i>under review</i>).

PEER REVIEWED CONFERENCE & WORKSHOP PROCEEDINGS	2.	N. Flemotomos , V.R. Martinez, Z. Chen, K. Singla, V. Ardulov, R. Peri, D. Caperton, J. Gibson, M.J. Tanana, P. Georgiou, J. Van Epps, S.P. Lord, T. Hirsch., Z.E. Imel, D.C. Atkins, and S. Narayanan. “Automated Evaluation of Psychotherapy Skills Using Speech and Language Technologies”, <i>Behavior Research Methods</i> , 2021.	
	3.	S.B. Goldberg, N. Flemotomos , V.R. Martinez, M. Tanana, P. Kuo, B.T. Pace, J.L. Villatte, P. Georgiou, J. Van Epps, Z.E. Imel, S. Narayanan, and D.C. Atkins. “Machine Learning and Natural Language Processing in Psychotherapy Research: Alliance as Example Use Case”, <i>Journal of Counseling Psychology</i> , 2020.	
	1.	Z. Chen, N. Flemotomos , V. Ardulov, T.A. Creed, Z.E. Imel, D.C. Atkins, and S. Narayanan. “Feature Fusion Strategies for End-to-End Evaluation of Cognitive Behavior Therapy Sessions”, <i>EMBC</i> , 2021.	
	2.	N. Flemotomos , P. Georgiou, and S. Narayanan. “Linguistically Aided Speaker Diarization Using Speaker Role Information”, <i>Odyssey</i> , 2020. Best Student Paper Finalist	
	3.	N. Flemotomos , and D. Dimitriadis. “A Memory Augmented Architecture for Continuous Speaker Identification in Meetings”, <i>ICASSP</i> , 2020.	
	4.	T.J. Park, M. Kumar, N. Flemotomos , M. Pal, R. Peri, R. Lahiri, P. Georgiou, and S. Narayanan. “The Second DIHARD Challenge: System Description for USC-SAIL Team”, <i>Interspeech</i> , 2019	
	5.	V.R. Martinez, N. Flemotomos , V. Ardulov, K. Somandepalli, S.B. Goldberg, Z.E. Imel, D.C. Atkins, and S. Narayanan. “Identifying Therapist and Client Personae for Therapeutic Alliance Estimation”, <i>Interspeech</i> , 2019.	
	6.	N. Flemotomos , P. Georgiou, D.C. Atkins, and S. Narayanan, “Role Specific Lattice Rescoring for Speaker Role Recognition from Speech Recognition Outputs”, <i>ICASSP</i> , 2019.	
	7.	N. Flemotomos , Z. Chen, D.C. Atkins, and S. Narayanan, “Role Annotated Speech Recognition for Conversational Interactions”, <i>SLT</i> , 2018.	
	8.	N. Flemotomos , P. Papadopoulos, J. Gibson, and S. Narayanan, “Combined Speaker Clustering and Role Recognition in Conversational Speech”, <i>Interspeech</i> , 2018.	
INVITED TALKS	9.	N. Flemotomos , V.R. Martinez, J. Gibson, D.C. Atkins, T.A. Creed, and S. Narayanan, “Language Features for Automated Evaluation of Cognitive Behavior Psychotherapy Sessions”, <i>Interspeech</i> , 2018.	
	10.	K. Singla, Z. Chen, N. Flemotomos , J. Gibson, D. Can, D.C. Atkins, and S. Narayanan, “Using Prosodic and Lexical Information for Learning Utterance-level Behaviors in Psychotherapy”, <i>Interspeech</i> , 2018.	
	1.	Alberta Hospital Edmonton/University of Alberta Forensic Grand Rounds <i>Towards Automated Large-Scale Evaluation of Psychotherapy</i>	Sep 2021
	2.	University of Southern California Interaction Lab <i>Who Spoke When? and how speaker roles can help us find the answer</i>	Apr 2021
REVIEWER	Journals: Applied Artificial Intelligence, PLOS ONE, Cogent Psychology, Behavior Research Methods Conferences: Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC)		

SERVICE AND VOLUNTARY WORK	USC Behavioral Science Society	
	Student executive board member	Dec 2020 to present
	IEEE Engineering in Medicine & Biology Society NTUA Student Chapter	
	President	Sep 2014 to Jun 2015
	Student volunteer	Sep 2013 to Jun 2014