

Nikolaos (Nikos) Flemotomos

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RESEARCH INTERESTS Speaker Diarization and Role Recognition, Speech Recognition, Behavioral Signal Processing

EDUCATION **Ph.D., Electrical Engineering** expected May 2022
University of Southern California, Los Angeles, CA, U.S.A.

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

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. (remote workplace)

Siri Understanding – Automatic Speech Recognition R&D Team

Machine Learning Engineering Intern

May 2021 to present

Supervisor: Dr. Arnab Ghoshal

- Working on 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.

Czech Technical University in Prague, Prague, Czech Republic

Biomedical Data and Signal Processing Group (BioDat)

Research Intern

Mar 2016 to Jun 2016

Supervisor: Assoc. Prof. Lenka Lhotska

- 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)

Undergraduate Research Assistant

Feb 2015 to Mar 2016

Supervisor: Prof. Petros Maragos

- 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^AT_EX

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

TEACHING
EXPERIENCE

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

Teaching Assistant

Spring 2019, 2020 & 2021

Speech Recognition and Processing for Multimedia

Society of Astronomy and Space, Volos, Greece

Teaching Assistant

Summer 2011 & 2012

Preparation for the International Olympiad on Astronomy and Astrophysics

HONORS AND
AWARDS

Phi Kappa Phi

Member (academic honor society)

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

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" (*under review*).
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", *Behavior Research Methods*, 2021 (*in press*).
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", *Journal of Counseling Psychology*, 2020.

PEER
REVIEWED
CONFERENCE
& WORKSHOP
PROCEEDINGS

1. **N. Flemotomos**, P. Georgiou, and S. Narayanan. “Linguistically Aided Speaker Diarization Using Speaker Role Information”, *Odyssey*, 2020.
Best Student Paper Nominee
2. **N. Flemotomos**, and D. Dimitriadis. “A Memory Augmented Architecture for Continuous Speaker Identification in Meetings”, *ICASSP*, 2020.
3. 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”, *Interspeech*, 2019
4. 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”, *Interspeech*, 2019.
5. **N. Flemotomos**, P. Georgiou, D.C. Atkins, and S. Narayanan, “Role Specific Lattice Rescoring for Speaker Role Recognition from Speech Recognition Outputs”, *ICASSP*, 2019.
6. **N. Flemotomos**, Z. Chen, D.C. Atkins, and S. Narayanan, “Role Annotated Speech Recognition for Conversational Interactions”, *SLT*, 2018.
7. **N. Flemotomos**, P. Papadopoulos, J. Gibson, and S. Narayanan, “Combined Speaker Clustering and Role Recognition in Conversational Speech”, *Interspeech*, 2018.
8. **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”, *Interspeech*, 2018.
9. 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”, *Interspeech*, 2018.

REVIEWER

Journals:

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

Hellenic Student Association of USC

Student volunteer and board member

Jan 2018 to May 2019

IEEE Engineering in Medicine & Biology Society NTUA Student Chapter

President

Sep 2014 to Jun 2015

Student volunteer

Sep 2013 to Jun 2014

7th International Olympiad on Astronomy and Astrophysics

Student volunteer

Aug 2014

Greek Astronomy Magazine ‘Ouranos’ (‘Sky’)

Member of the writing team

Sep 2012 to Mar 2015