Nikolaos (Nikos) Flemotomos

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

EDUCATION		
	Ph.D., Electrical Engineering University of Southern California, Los Angeles, CA, U.S.A.	expected May 2022
	M.Sc., Electrical Engineering University of Southern California, Los Angeles, CA, U.S.A. GPA: 4.00/4.00	Dec 2018
	Diploma (5-years degree)**, Electrical and Computer Engineering** National Technical University of Athens, Athens, Greece Thesis: *Robust Acoustic Features for Distant Speech Recognition* GPA: 9.34/10.00	Apr 2016

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, LaTeX

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 May 2021

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