Prof. Alexandros Potamianos, Ph.D., M.B.A.

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Current Positions

Amazon Scholar at Amazon Alexa, Los Angeles, CA
Adjunct Professor at Viterbi School of Engineering, University of Southern California, CA
Associate Professor at the School of Electrical and Computer Engineering, NTUA, GR

Research Interests

speech processing, analysis, synthesis and recognition; spoken dialogue systems; natural language understanding and cognitive semantic representations; multi-modal human-machine interaction; nonlinear signal processing; representation learning; language acquisition; mobile communications; artificial intelligence.

Education

Master in Business Administration Fall 2002, Major in Finance
New York University, New York, New York

Ph.D., 1995, Engineering Sciences
Harvard University, Cambridge, Massachusetts
Advisor: Prof. Petros Maragos
Thesis: "Speech Processing Applications Using an AM-FM Modulation Model"

M.S., 1991, Engineering Sciences
Harvard University, Cambridge, Massachusetts GPA: 3.7/4.0

Diploma, 1990, Electrical and Computer Engineering (5-yr. program)
National Technical University of Athens, Greece
Advisor: Prof. G. Karagiannis
Thesis: "Speech Synthesis using Formant Synthesizers" GPA: 9.3/10.0

Work Experience

Amazon Alexa, Los Angeles, CA
Position: Amazon Scholar, Aug. 2021 to current
Work Description: Working on multi-user task-oriented conversational systems, contextual language understanding and natural open-mike interaction.

Behavioral Signal Technologies, Los Angeles, CA
Position: CEO, June 2016 to Jan. 2019; CTO Jan. 2019 to July 2021
Work Description: As CEO defined company strategy, secured $2.5M funding, grew the team to 20+ people; as CTO supervised a team of 15 engineers, built technical roadmap & oliverAPI specifications (on detecting emotion, behaviors and KPIs from audio), IP/patents.

School of ECE, National Technical University of Athens, Athens, Greece
Position: Associate Professor, Jan. 2013 to current
Areas of investigation: spoken dialogue systems, cognitively-motivated semantic representations, lexical networks, robust speech recognition, representation learning, language acquisition in typically-developing and autistic spectrum children, multimedia processing and analysis of movies, affective analysis of spoken dialogue systems, attentional/saliency models for multimedia.

Dept of EE, Viterbi School of Eng., Univ. of Southern California, Los Angeles, USA
Position: Visiting Associate Professor, Sept. 2013 to current
Areas of investigation: multimodal analysis of autism in children, analysis of children's speech, affective models of text, sentiment analysis, multimedia processing of movies.

School of ECE, Technical University of Crete, Chania, Greece
Position: Associate Professor, Jan. 2003 to May 2013
Areas of investigation: Multimodal dialogue systems, multimedia systems for children, statistical machine translation, semantic similarity and auto-induction of semantic classes, feature extraction for robust speech recognition, speech transformations for robust speech recognition, blind source separation, affective analysis of text, sentiment analysis.

Multimedia Communication Laboratory, Bell Labs, Lucent Tech., Murray Hill, NJ, USA
Position: Acting Research Supervisor, Aug. 2001 to Sept. 2002
Areas of investigation: Manager of the Spoken Dialogue System group that consists of four researchers and four contractors. Chief architect of the spoken dialogue services authoring environment. Research work on semantic representation of ambiguity, natural language understanding and generation, dialogue management, multi-modal systems. Continued work on robust acoustic modeling and robust feature extraction.

Position: Technical Staff Member, Feb. 1999 to Aug. 2001
Areas of investigation: Project manager and principal investigator for the DARPA Communicator program. Managed a team of five researchers and developers. Designed and implemented a finite state machine natural language understanding parser, the semantic representation and the dialogue manager for an automated travel reservation system. Other work: speech recognition for wireless handsets and multi-modal systems.

Speech and Image Processing Lab, AT&T Labs, Florham Park, NJ, USA
Position: Senior Technical Staff Member, Dec. 1995 to Feb. 1999
Areas of investigation: Acoustic modeling and robust speech recognition: instantaneous and long-term speaker and environmental adaptation. Multi-modal input and multimedia output systems design. Initiated and co-managed the agent ChIMP project (Children Interactive Multimedia Project): acoustic, language and dialog modeling for children speakers; designed and built the first multi-modal/multimedia system in AT&T Labs.

Digital Signal Processing Lab, Georgia Institute of Tech., Atlanta, GA, USA
Position: Research Assistant, July 1993 to December 1995
Applications of the AM-FM modulation model and energy operators to speech processing: the AM-FM modulation vocoder; features for automatic speaker and speech recognition; multi-band demodulation formant and pitch tracking algorithms

Speech Research Department, AT&T Bell Labs, Murray Hill, NJ, USA
Position: Member Technical Staff-Level I, June to Sept. 1994
Characterizing the carbon button telephone transducer and effects on speech recognition.

Harvard Robotics Lab, Harvard University, Cambridge, MA, USA
Position: Research Assistant, July 1991 to June 1993
Speech modeling; development of tools for nonlinear signal processing.

Center for Research, Testing and Standards, National Power Corporation, Peania, Greece
Position: Summer Intern and Contractor, June 1987 to September 1988
Created database tools for archiving tests and organizing the center's library using DBASE IV. Processed progress reports during the construction of the Amyntaion Power Plant.

Teaching Experience

School of ECE, National Technical University of Athens, Athens, Greece
Speech and Language Proc. (2013-), Pattern Recognition (2014-), Signals & Systems(2014-2019)
Graduate Courses: Advanced Pattern Recognition and Machine Learning (2019)

School of ECE, Technical University of Crete, Chania, Greece
"Statistical Modeling and Pattern Recognition" (2005-2010), "Speech Processing", "Audio and Music Processing" (2011-2013), "Natural Language Processing" (2003-2013), "Probability and Random Processes" (2003-2011)
Graduate Courses: "Selected Areas in Speech and Natural Language Processing", "Functional Analysis and Representation Modeling".

Adjunct Professor 1999-2000, Dept. of EE, Columbia University, New York, NY, USA
EE 3910: “Elements of Digital Systems” (1999)
EE 3701: “Introduction to Communication Systems and Networks” (2000)

Skills

Managerial Skills: Run Behavioral Signals as CEO (2016-2019) growing it to 20+ people; supervised a team of 15 engineers as the CTO (2019-). Supervised the work of numerous graduate students in NTUA and TUC. Coordinator and work-package leader in EU-IST (BabyRobot, PortDial, SpeDial, MUSCLE, HIWIRE) and US-DARPA projects. Supervised a group of four MTS at Bell Labs: planning and definition of research goals, project management and yearly performance evaluation. Member of the Bell Labs Research strategy group. SDS Lead for DARPA Communicator project. Project coordinator of EU projects PortDial, SpeDial, BabyRobot. Taken courses on managing organization behavior, multinational management and on conflict/negotiation.

Computer Skills: extensive programming experience in JAVA, Python, C++/C, PERL; working knowledge of Tcl/Tk. Extensive programming experience in Matlab and variants. Extensive experience on UNIX variants, MacOs, Windows.

Research and Development: in depth knowledge of most aspects of speech processing (analysis, synthesis and recognition) and dialogue system design; expert in acoustic modeling and robustness algorithms for speech recognition; extensive experience in language modeling, lexical semantics, understanding and dialog modeling; in depth knowledge of machine learning, representation learning, deep learning; hands-on experience on designing and building prototype multi-modal/multimedia systems with emphasis on the spoken language interface; 25+ experience in speech research in academic/industrial environment; excellent knowledge of literature in the field. Unique understanding of cognitive aspects of speech/language proc., representation-based modeling of signals and cognitively motivated signal proc.

Theoretical Background: signal processing, probability theory, machine learning and pattern recognition, DNNs, Bayesian networks (HMMs, CRFs), random processes, information theory, robotics, communications, control, nonlinear systems, detection/estimation; applied mathematics: numerical analysis, functional analysis, stochastic calculus; business strategy, microeconomics and network economics.

Honors and Activities

Recipient of the Wallace Fellowship 1991-92 at Harvard University
Harvard University Fellow 1990-91.
National Technical University of Athens Fellow 1985-86, 1986-87, 1987-88 (top 2%).

IEEE Speech Technical Committee member 2000-2003, 2007-2010, 2012-2015

IEEE Multimedia Signal Processing Committee Member 2012-2015

IEEE Signal Processing Society Best Paper Award 2005

Co-winner of the Interspeech 2014 Paralinguistic challenge

Co-winner of the sentiment analysis twitter challenge track at SemEval 2016 and 2018

Elected to IEEE Fellow 2016

General co-chair MMSP 2007, technical co-chair ICMI 2007, general co-chair ICMI 2008,

Distinguished Lecturer ICNC 2017

Selected Invited/plenary talks: ILSP (1999), Speechworks(2000), Columbia University (2001), Univ. of Southern California (2001, 2004, 2008, 2012, 2013), FBK-IRST (2003, 2004), IBM (2005), UCLA, UCSB (2008), ICSI, AT&T Labs (2012), U.Trento (2013), USC (2013), U. Dallas, Microsoft, AT&T Labs, IBM, UCLA, Google, CMU (2014), Conversational Interfaces Conf. (2019), Amazon (2021)

Associate Editor for: IEEE Transaction on Affective Computing 2013-18; Computer, Speech and Language (Elsevier) 2013-; Journal on Multimodal Interfaces (Elsevier) 2011-15

Reviewer/Area Chair: IEEE TSAP/SPL. ICASSP, Interspeech, ASRU/SLT, MMSP

Panelinst/Reviewer for NSF, EU-IST

Patents Four patents awarded, three patents under review

Publications Over 200 papers published in professional journals and conferences, over 8000 citations, h-index:46 (as of January 2023, source google scholar)

Affiliations Fellow of the IEEE Signal Processing Society, Member of the ACM

Languages Fluent in English and Greek; conversing and writing ability in French, Spanish.

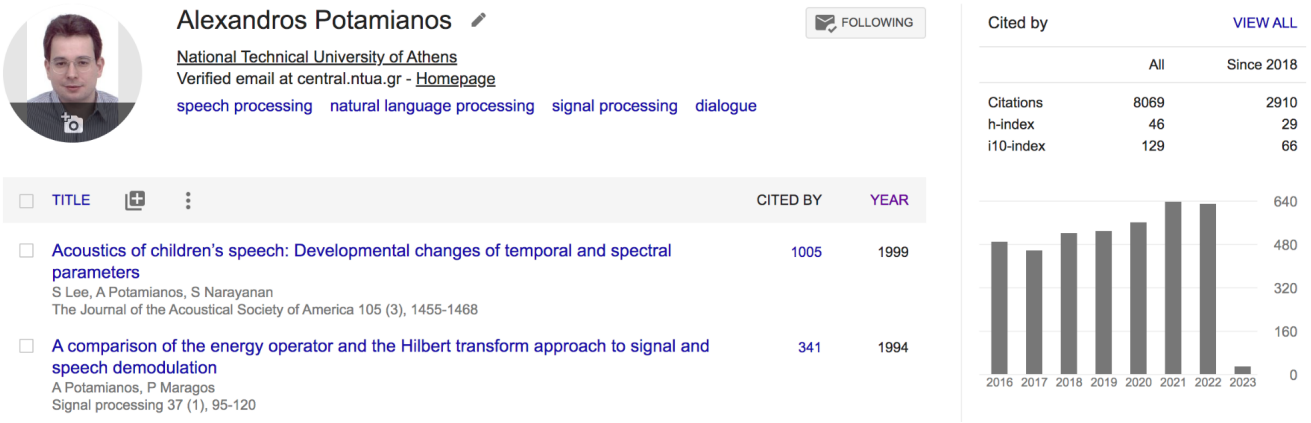
Books and Book Chapters

1. P. Maragos, A. Potamianos and P. Gros (eds), *Multimodal Processing and Interaction: Audio, Video, Text* , Springer-Verlag, 2008.
2. A. Potamianos and M. Perakakis, " Human-Computer Interafaces to Multimedia Content: A Review ," in *Multimodal Processing and Interaction: Audio, Video, Text*, Springer-Verlag, 2008.
3. A. Potamianos and M. Perakakis, " Design Principles for Multimodal Spoken Dialogue Systems ," in *Multimodal Processing and Interaction: Audio, Video, Text*, Springer-Verlag, 2008.
4. G. Evangelopoulos, K. Rapatzikos, P. Maragos, Y. Avrithis, A. Potamianos, "Audiovisual Attention Modeling and Salient Event Detection", in *Multimodal Processing and Interaction: Audio, Video, Text*, Springer-Verlag, 2008.

Journal and Conference Publications

For a full list see here:

https://scholar.google.com/citations?user=pBQViyUAAAAJ&hl=en



Awarded Patents

1. Potamianos and R. C. Rose, "A Time-Varying Feature Space Preprocessing Procedure for Telephone Based Speech Recognition," Patent No 5765124, awarded to Lucent Technologies, 1995.
2. Potamianos and R. C. Rose, "Combining Frequency Warping And Spectral Shaping In HMM Based Speech Recognition," Patent No 5930753, awarded to AT&T, 1999.
3. Zeljkovic, S. Narayanan, and A. Potamianos, "Unsupervised HMM adaptation based on speech-silence discrimination," Patent No 6076057, awarded to AT&T, 2000.
4. V. Weerackody, W. Reichl and A. Potamianos, "Soft feature decoding in a distributed automatic speech recognition system for use over wireless channels," U.S. Patent No. 6,760,699, awarded to Lucent Technologies, 2004.

Recent Patents under Review

1. A. Katsamanis, S. Narayanan, and A. Potamianos, "Deep actionable behavioral profiling and shaping," US Patent App. 16/441,521, Dec. 2019.
2. G. Paraskevopoulos, E. Chatziagapi, T. Giannakopoulos, A. Potamianos, and S. Narayanan, "Speech data augmentation," US Patent App. 16/852,793, Oct. 2020.
3. E. Georgiou, G. Paraskevopoulos, J. Gibson, A. Potamianos, and S. Narayanan, "Deep hierarchical fusion for machine intelligence applications," in US Patent App. 16/852,872, Oct. 2020.

Research Contracts as Project Coordinator

1. Program coordinator for the PENED 2003 GSRT project on aerodynamic modeling of the vocal tract (2006-2009, for a total of 120,000 euros)
2. Project Coordinator EU-IST FP7 STREP PortDial (2-year contract 2012-2014 for a total of 420,000 euros, total project EU contribution 1.95M euros)
3. Project Coordinator EU-IST FP7 STREP SpeDial (2-year contract 2013-2015 for a total of 330,000 euros, total project EU contribution 1.45M euros)
4. Project Coordinator ARISTEIA II GSRT project BabyAffect (2014-2015 for a total of 263,000 euros)
5. Project Technical Coordinator for the EU-IST H2020 STREP project BabyRobot (3-year contract 2015-2018 for a total of 650,000 euros, total project EU contribution 3.99M euros)

Research Contracts as Site Coordinator

1. Principal Investigator for US DARPA Communicator contract, award $1,000,000 per year, 1999-2001; project manager for $500,000 per year.
2. Coordinator for Tech. Univ. of Crete and work-package leader for the EU-IST STREP program HIWIRE (3-year contract 2004-2007, for a total of 270,000 euros).
3. Coordinator for Tech. Univ. of Crete and work-package leader for the EU-IST Network of Excellence program MUSCLE (4-year contract 2004-2008, for a total of 200,000 euros).

Research Contracts as Member of a Team

1. Consultant for National Technical University of Athens, Greece, “Speech Recognition using Modulation and Chaotic Features”, principal investigator Prof. P. Maragos.
2. Consultant for Institute for Language and Speech Processing, Athens, Greece, “Large Vocabulary Continuous Speech Recognition in Greek,” principal investigator Prof. G. Karagiannis.
3. Consultant for the PENED 2003 GSRT project on multimodal interfaces (2006-2009)
4. Consultant for the EU-FP6 STREP FET ASPI (2008-2009)
5. Consultant for the EU-FP7 STREP DICTASIGN (2009-2011)
6. Consultant for the US DARPA RATS project (2013-2014)
7. Consultant for the EU-FP7 LANGTERRA project (2014-2015)
8. Consultant for the ARISTEIA I GSRT project COGNIMUSE (2013-2015)
9. Consultant for the DARPA LORELEI project at USC (2017-2019)

Startup Funding

1. Secured $2.5M of seed funding from Kairos Ventures fas the CEO of Behavioral Signals.
2. Helped negotiate follow-up funding rounds for a total of $7M funding for Behavioral Signals.

Ph.D. Students Supervised

1. Manolis Perakakis, Technical University of Crete, 2011
2. Pirros Tsiakoulis, National Tech. Univ. of Athens, 2010
3. Ilias Iosif, Technical University of Crete, 2013
4. Aris Fergadis, National Tech. Univ. of Athens, 2016-
5. George Paraskevopoulos, National Tech. Univ. of Athens, 2017-
6. Artemis Dampa, National Tech. Univ. of Athens, 2018-
7. Charis Papaioannou, National Tech. Univ. of Athens, 2018-
8. Efthimis Georgiou, National Tech. Univ. of Athens, 2019-

M.Sc. Students Supervised

1. Michel Galley, Bell Labs, Lucent Technologies, 2001.
2. Roger Argiles-Solsona, Bell Labs, Lucent Technologies, 2002.
3. Apostolis Pangos, Technical University of Crete, 2005.
4. Panagiotis Karagiorgakis, Technical University of Crete, 2005.
5. Michalis Toutoudakis, Technical University of Crete, 2007
6. Christos Koniaris, Technical Univeristy of Crete, 2006
7. Michail Maragkakis, Technical Univerity of Crete, 2008
8. Ilias Iosif, Technical Univerity of Crete, 2007
9. Ioannis Klasinas, Technical Univerity of Crete, 2008
10. Thanasis Tegos, Technical Univerity of Crete, 2009
11. Theofanis Kanetis, Technical University of Crete, 2009
12. Theodosis Moschopoulos, Technical University of Crete, 2012
13. Nikos Malandrakis, Technical University of Crete, 2012
14. Vassiliki Kouloumenta, Technical University of Crete, 2013
15. Georgia Anagnostopoulou, Technical University of Crete, 2015
16. Elissavet Palogianidi, Technical University of Crete, 2016
17. Arodami Chorianopoulou, Technical University of Crete, 2016
18. Spyros Georgiladakis, Technical University of Crete, 2015

Also 30+ **DiplomaThesis Supervised** at Technical University of Crete (2003-2013), and

30+ **Diploma Thesis Supervised** at NationalTechnical University of Athens (2013-).