

# Theodoros Giannakopoulos

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## GENERAL INFORMATION

Date of birth: 09/04/1980  
Place of birth: Athens, Greece  
E-mail: tyiannak@gmail.com  
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Google Scholar Citation List: user=BeIoqhwAAAAJ

## EDUCATION

PHD, University of Athens, Dept of Informatics and Telecommunications, 2009

- Thesis Title: *Study and application of acoustic information for the detection of harmful content, and fusion with visual information*
- Advisor: Professor Sergios Theodoridis

MSC, Signal and Image Processing Systems, 2004

- With Honors (final grade: 9.34/10)
- Thesis Title: *Design and implementation of real-time processing methods of speech signals, using microphone arrays*
- Advisor: Professor Nikos Fakotakis

B.S., University of Athens, Dept of Informatics and Telecommunications, 2002

- Final grade: 7.14/10
- Thesis Title: *Design and implementation of a semi-automatic method for boundary detection in high resolution ultrasound images*

## RESEARCH INTERESTS

AUDIO ANALYSIS: speech - music discrimination, segmentation, multi-class audio classification, event detection, music tracking, speech recognition, speaker clustering, speech emotion recognition.

MULTIMEDIA SIGNAL PROCESSING: movie classification and summarization, emotion recognition, detection of harmful events in movies.

DATA MINING

PATTERN RECOGNITION AND MACHINE LEARNING: parametric and non-parametric classification techniques, Hidden Markov Models, Bayesian Networks, Neural Networks, feature selection, classifier combination techniques, clustering.

IMAGE PROCESSING AND IMAGE ANALYSIS: emphasis on medical image processing.

## PUBLICATIONS

### BOOKS

- 1 Theodoros Giannakopoulos and Aggelos Pikrakis, Introduction to Audio Analysis: A MATLAB Approach, Academic Press, 2014, ISBN: 9780080993881

## JOURNALS

- 4 Theodoros Giannakopoulos and Sergios Petridis. Fisher Linear Semi-discriminant Analysis for Speaker Diarization, *IEEE Transactions On Audio, Speech, And Language Processing*, Vol. 20, No. 7, September 2012
- 3 Thanassis Perperis, Theodoros Giannakopoulos, Alexandros Makris, Dimitrios I. Kosmopoulos, Sofia Tsekeridou, Stavros J. Perantonis and Sergios Theodoridis. Multimodal and ontology-based fusion approaches of audio and visual processing for violence detection in movies. *Expert Systems with Applications*, Vol 38(11), October 2011, pp: 14102-14116
- 2 Aggelos Pikrakis, Theodoros Giannakopoulos, and Sergios Theodoridis. A speech - music discriminator of radio recordings based on dynamic programming and bayesian networks. *Multimedia*, *IEEE Transactions on*, 10(5):846-857, 2008.
- 1 Theodoros Giannakopoulos, Nikolas Tatlas, Todor Ganchev, and Ilias Potamitis. A practical, real-time speech-driven home automation front-end. *IEEE Transactions on Consumer Electronics*, 51(2):514-523, 2005.

## BOOK CHAPTERS

- 1 Aggelos Pikrakis, Theodoros Giannakopoulos, and Sergios Theodoridis. An overview of speech - music discrimination techniques in the context of audio recordings. *Multimedia Services in Intelligent Environments (Advanced Tools and Methodologies, Studies in Computational Intelligence)*, 120:81-102, 2008.

## BOOK TRANSLATIONS - EDITING

- 2 Translation (to Greek) of the book: "Multimedia Systems: Algorithms, Standards, and Industry Practices", Parag Havaladar and Gerard Medioni
- 1 Translation (to Greek) and editing of the book: "Pattern Recognition", Sergios Theodoridis and Konstantinos Koutroumbas

## CONFERENCES

- 20 Petridis, Sergios, Theodoros Giannakopoulos, and Constantine D. Spyropoulos. "Unobtrusive Low Cost Pupil Size Measurements using Web cameras." *International Workshop on Artificial Intelligence and NetMedicine 2013*.
- 19 Giannakopoulos, Theodoros, Harry Dimitropoulos, Omiros Metaxas, Natalia Manola, and Yannis Ioannidis. "Supervised Content Visualization of Scientific Publications: A Case Study on the ArXiv Dataset." In *Language Processing and Intelligent Information Systems*, pp. 206-211. Springer Berlin Heidelberg, 2013 (Proc. of The 20th International Conference Intelligent Information Systems).
- 18 Theodoros Giannakopoulos and Sergios Petridis. Detection and Clustering of Musical Audio Parts Using Fisher Linear Semi-Discriminant Analysis, accepted for publication in 20th European Signal Processing Conference (EUSIPCO2012), 2012.
- 17 Theodoros Giannakopoulos and Sergios Petridis. Unsupervised speaker clustering in a linear discriminant subspace. In *Ninth International Conference on Machine Learning and Applications*, 2010.
- 16 Theodoros Giannakopoulos, Makris Alexandros, Dimitrios Kosmopoulos, Stavros Perantonis, and Sergios Theodoridis. Audio-visual fusion for detecting violent scenes in videos. In *6th Hellenic Conference on Artificial Intelligence (SETN10)*, 2010.

- 15 Sergios Petridis, Theodoros Giannakopoulos, and Stavros Perantonis. A multi-class method for detecting audio events in news broadcasts. In 6th Hellenic Conference on Artificial Intelligence (SETN10), 2010.
- 14 Theodoros Giannakopoulos, Sergios Petridis, and Stavros Perantonis. User-driven recognition of audio events in news videos. In 5th International Workshop on Semantic Media Adaptation and Personalization (SMAP2010), 2010.
- 13 Sergios Petridis, Katernia Papantoniou, Theodoros Giannakopoulos, Georgios Paliouras, Miltiadis Koutsokeras, Ilias Zavitsanos, George Tsatsaronis, Girorgos Akriavas, Basilis Gatos, Kostas Ntirogiannis and Stavros Perantonis, Joint analysis of audio and text data in CASAM, in Proceedings of the 5th International Conference on Semantic and Digital Media Technologies (SAMT 2010), 2010
- 12 Theodoros Giannakopoulos, Aggelos Pikrakis, and Sergios Theodoridis. A multi-modal approach to violence detection in video sharing sites. In 20th International Conference on Pattern Recognition (ICPR2010), 2010.
- 11 Theodoros Giannakopoulos, Aggelos Pikrakis, and Sergios Theodoridis. A dimensional approach to emotion recognition of speech from movies. In 34th International Conference on Acoustics, Speech, and Signal Processing (ICASSP2009), 2009.
- 10 Theodoros Giannakopoulos Aggelos Pikrakis and Sergios Theodoridis. Gunshot detection in audio streams from movies by means of dynamic programming and bayesian networks. In 33rd International Conference on Acoustics, Speech, and Signal Processing (ICASSP08), 2008.
- 9 Theodoros Giannakopoulos, Aggelos Pikrakis, and Sergios Theodoridis. A novel efficient approach for audio segmentation. In 19th International Conference on Pattern Recognition, 2008 (ICPR08), 2008.
- 8 Theodoros Giannakopoulos, Aggelos Pikrakis, and Sergios Theodoridis. Music tracking in audio streams from movies. In IEEE International Workshop on Multimedia Signal Processing (MMSP08), 2008.
- 7 Aggelos Pikrakis, Theodoros Giannakopoulos, and Sergios Theodoridis. A dynamic programming approach to speech - music discrimination of radio recordings. In 15th European Signal Processing Conference (EUSIPCO07), 2007.
- 6 Theodoros Giannakopoulos, Aggelos Pikrakis, and Sergios Theodoridis. A multi-class audio classification method with respect to violent content in movies, using bayesian networks. In IEEE International Workshop on Multimedia Signal Processing (MMSP07), 2007.
- 5 Aggelos Pikrakis, Theodoros Giannakopoulos, and Sergios Theodoridis. A computationally efficient speech - music discriminator for radio recordings. In 2006 International Conference on Music Information Retrieval and Related Activities (ISMIR06), 2006.
- 4 Theodoros Giannakopoulos, Dimitrios Kosmopoulos, Andreas Aristidou, and Sergios Theodoridis. Violence content classification using audio features. In 4th Hellenic Conference on Artificial Intelligence (SETN06), 2006.
- 3 Theodoros Giannakopoulos, Aggelos Pikrakis, and Sergios Theodoridis. A speech - music discriminator for radio recordings using bayesian networks. In 2006 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP06), 2006.

- 2 Aggelos Pikrakis, Theodoros Giannakopoulos, and Sergios Theodoridis. Speech - music discrimination for radio broadcasts using a hybrid hmm-bayesian network architecture. In 14th European Signal Processing Conference (EUSIPCO06), 2006.
- 1 T. Giannakopoulos, D. Cavouras, N. Dimitropoulos, and S. Theodoridis. Design and implementation of a semi-automatic algorithm for boundary detection of breast nodules in high-resolution ultrasound images. In 3rd European Symposium on Biomedical Engineering and Medical Physics, 2002.

#### AWARDS

Winner of the IEEE International Workshop on Multimedia Signal Processing (MMSP07) student paper contest, for the paper titled “A multi-class audio classification method with respect to violent content in movies, using bayesian networks”

First award in the Ninth International Conference on Machine Learning and Applications Speaker Clustering Challenge (2010), for the paper titled “Unsupervised Speaker Clustering in a Linear Discriminant Subspace”.

#### TEACHING EXPERIENCE

University of Athens, Dept of Informatics and Telecommunications

Teaching and laboratory assistant for the undergraduate course: *Introduction to Digital Signal Processing*, 2004 TO 2008

Supervision of 3 diploma theses in the field of pattern recognition

University of Patras, Dept Computer Engineering and Informatics Department

Teaching and laboratory assistant for the undergraduate course *Introduction to Programming*, 2002 TO 2004

#### RESEARCH EXPERIENCE

AUGUST 2013 - TODAY: Post-doc research member in the in the EU funded research project “AMINESS: Analysis of Marine INformation for Environmentally Safe Shipping”. Participant: Computational Intelligence Lab, Department of Informatics and Telecommunications, National Centre for Scientific Research Demokritos, Greece

JUNE 2012 - TODAY: Post-doc research member in the in the EU funded research project “USEFIL: Unobstrusive Smart Enviroments For Independent Living”. Participant: Computational Intelligence Lab, Department of Informatics and Telecommunications, National Centre for Scientific Research Demokritos, Greece

FEBRUARY 2012 - TODAY: Post-doc research member in the Institute for the Management of Information Systems (IMIS) of the Research and Innovation Centre in Information, Communication and Knowledge Technologies ”Athena”.

JULY 2009 - APRIL 2011: Post-doc research member in the EU funded research project Computer-Aided Semantic Annotation of Multimedia - CASAM. Participant: Computational Intelligence Lab, Department of Informatics and Telecommunications, National Centre for Scientific Research Demokritos, Greece

FEBRUARY 2009 - JUNE 2009: Research member in the EU funded research project Prometheus (PRediction and interpretation of huMan bEhaviour based on probabilistic sTructures and HEterogeneoUs Sensors - FP7-214901). Participant: University of Patras, The Wire Communications Laboratory.

DECEMBER 2005 - NOVEMBER 2008: Research member in the research project PENED - 03ED375 (Reinforcement Programme of Human Research Manpower, and co-financed by National and European Community funds). Participant: University of Athens, Department of Informatics and Telecommunications.

DECEMBER 2004 - NOVEMBER 2005: Research member in the IST I-IMAS project (Intelligent Imaging Sensors for Industry, Health and Security). Participant: Computer Technology Institute and Press "Diophantus"

FEBRUARY 2003 - SEPTEMBER 2004: Research member in the European Union IST research projects INSIPRE (INFotainment management with Speech Interaction via REmote-microphones and telephone interfaces, IST-2001-32746) and 2023 ITEA-AMBIENCE: Context aware environments for ambient services. Participant: University of Patras, The Wire Communications Laboratory.

MARCH - APRIL 2002: Visiting researcher in the Institute of Child Health, University of Birmingham. Subject: Telemedicine and Medical Image Processing.

#### OTHER ACTIVITIES

Reviewer:

In conferences:

- International Conference on Digital Signal Processing (DSP): 2008, 2011, 2013
- International Conference on Pattern Recognition (ICPR): 2010, 2012
- Hellenic Conference on Artificial Intelligence (SETN): 2010, 2012
- European Signal Processing Conference (EUSIPCO): 2012

In journals:

- Transactions on Multimedia - IEEE
- Pattern Recognition Letters - ELSEVIER
- Neurocomputing - ELSEVIER
- Journal on Advances in Signal Processing - EURASIP
- Language Resources and Evaluation - SPRINGER

2004-2008: Administrator of the web site of the International Society for Pediatric Neurosurgery [ispneurosurgery.org](http://ispneurosurgery.org).

2007 - today: Co-founder of the Spyros Sgouros - MIP: Medical Image Processing Co (reg: 246433), focusing on the development of web-based medical image processing tools.

2008 - 2011: Administrator of the web site of the European Association for Signal Processing - EURASIP: [eurasip.org](http://eurasip.org).

#### TECHNICAL SKILLS

MATLAB experience: signal processing, audio processing and analysis, image processing, etc. Member of the Mathworks File Exchange Center.

Programming Languages: C, C++, Python, Java, Pascal, UNIX shell scripting

Databases: mySQL, PostgreSQL

Web-development: JSP, ASP, PHP, JavaScript

Other packages: Pentaho Weka, SPSS, R, MS Office

Operating Systems: Linux, Microsoft Windows family

FOREIGN  
LANGUAGES

ENGLISH: First Certificate (Cambridge)

GERMAN: Elementary understanding