

# CURRICULUM VITAE

## **Maria Markaki**

### **CONTACT INFORMATION**

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Crete, Greece

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### **NATIONALITY**

Greek

*Date of birth:* 12.28.1966

### **RESEARCH INTERESTS**

Speech processing, audio and acoustic signal processing,  
pattern recognition, voice detection, voice pathology detection,  
music information retrieval

### **EDUCATION**

2005-2011

PhD, Computer Science Department, University of Crete  
*Relevant features for audio classification tasks*  
Advisor: Prof. Yannis Stylianou

2002-2005

MSc, Computer Science Department, University of Crete  
*Computational role of modulation of excitability in a CA1  
hippocampal pyramidal neuron during aging*  
Advisor: Prof. Stelios Orphanoudakis

2001

Interdisciplinary Graduate Program in the Brain and Mind  
sciences, Faculty of Medicine, University of Crete  
Scholarship: IACM FORTH

1992-1996

MSc, Division of Environmental Physics and Meteorology,  
Department of Physics, National and Kapodistrian University of  
Athens  
*Matched-field processing and hybrid algorithms for vertical slice  
tomography*  
Advisor: Prof. Michael Taroudakis

1991

BSc, Department of Physics, National and Kapodistrian  
University of Athens

### **WORK EXPERIENCE**

2002-2011

Graduate teaching assistant in courses of Computer Science  
Department, University of Crete: Pattern recognition, Digital  
Design, Applied Mathematics for Engineers, Digital Signal  
Processing and Speech Processing

2005-2010 Research staff, Multimedia Informatics Lab, Computer Science Department, University of Crete  
1995-2000 Research staff, Underwater Acoustics, Institute of Applied and Computational Mathematics, Foundation of Research and Technology Hellas (FORTH-IACM)

## RESEARCH PROJECTS

2010 Latsis Public Benefit Foundation  
Automatic detection of murmurs in children phonocardiographic signals

2009 E.U. ESF, COST OFFICE:  
VOICE: Advanced Voice Function Assessment

2008 Greek Ministry of Development, GSRT: TV++, Multimedia Indexing Systems

2005-2007 E.U. IST, Network of Excellence: SIMILAR  
Research in Human-Machine Multimodal Interfaces (Speech modality)

## REVIEWING

2010- Reviewer in Journals:

- IEEE Signal Processing Letters
- Elsevier, Speech Communication
- Elsevier, Digital Signal Processing
- EURASIP Journal on Advances in Signal Processing Research
- International Journal of Information Technology & Decision Making

CITATIONS Total citation count: 159 h-index: 7

## PUBLICATIONS

### JOURNALS

1. M. Markaki and Y. Stylianou:  
*"Voice Pathology Detection and Discrimination based on Modulation Spectral Features"*  
IEEE Trans. Audio, Speech and Language Processing, vol.19, no.7, pp.1938-1948, Sept 2011.
2. J.D. Arias-Londono, J.I. Godino-Llorente, M. Markaki and Y. Stylianou:  
*"On combining information from Modulation Spectra and Mel-Frequency Cepstral*

*Coefficients for automatic detection of pathological voices"*

Logopedics Phoniatrics Vocology, vol.36, no.2, pp.60-69, 2011.

3. M. Markaki and Y. Stylianou:  
"Discrimination of Speech from Nonspeech in Broadcast News Based on Modulation Frequency Features"  
Speech Communication: Special Issue on Perceptual and Statistical Audition, vol.53, no.5, pp.726-735, May-June 2011.
4. M. Markaki, S. Orphanoudakis and P. Poirazi:  
"Modeling reduced excitability in aged CA1 neurons as a calcium-dependent process"  
Neurocomputing, vol.65-66, pp.305-314, 2005.
5. M.I. Taroudakis and M. Markaki:  
"Tomographic inversions in shallow water using modal travel time measurements"  
ACTA ACUSTICA united with ACUSTICA, vol.87, pp.647-658, 2001.
6. M.I. Taroudakis and M. Markaki:  
"Bottom geoacoustic inversion by matched field processing – a sensitivity study"  
Inverse Problems, vol.16, pp.1679-1692, 2000.
7. M.I. Taroudakis and M. Markaki:  
"Bottom geoacoustic inversions by broadband matched field processing"  
J. Computational Acoustics, vol.6, no.1&2, pp.167-183, 1998.
8. M.I. Taroudakis and M. Markaki:  
"On the use of matched-field processing and hybrid algorithms for vertical slice tomography"  
J. Acoustical Society of America, vol.102, pp.885-895, 1997.

**CONFERENCE PROCEEDINGS**

9. M. Markaki, I. Germanakis and Y. Stylianou:  
"Automatic detection and classification of heart sounds and systolic murmurs based on reassigned spectrogram"  
ESC Congress 2012:[www.escardio.org/congresses/esc-2012/Documents/monday.pdf](http://www.escardio.org/congresses/esc-2012/Documents/monday.pdf)
10. M. Markaki, Y. Stylianou, J.D. Arias-Londono and J.I. Godino-Llorente:  
"Dysphonia Detection based on Modulation Spectral Features and Cepstral Coefficients"  
IEEE ICASSP, March 2010.
11. M. Markaki and Y. Stylianou:  
"Modulation Spectral Features for Objective Voice Pathology Assessment"  
IEEE ISCCSP, March 2010.
12. M. Markaki and Y. Stylianou:  
"Modulation Spectral Features for Objective Voice Pathology Assessment: the breathiness case"  
6th International Workshop on Models & Analysis of Vocal Emissions

for Biomedical Applications, Florence, Italy, December 2009.

13. M. Markaki and Y. Stylianou:  
*"Using Modulation Spectra for Voice Pathology Detection and Classification"*  
IEEE EMBS, September 2009.
14. M. Markaki and Y. Stylianou:  
*"Normalized Modulation Spectral Features for Cross-Database Voice Pathology Detection"*  
InterSpeech, September 2009.
15. M. Markaki and Y. Stylianou:  
*"Evaluation of Modulation Frequency Features for Speaker Verification and Identification"*  
EUSIPCO, August 2009.
16. M. Markaki and Y. Stylianou:  
*"Voice Pathology Detection and Classification based on Modulation Spectra"*  
3<sup>rd</sup> Advanced Voice Function Assessment International Workshop,  
pp.153-156, May 2009.
17. M. Markaki and Y. Stylianou:  
*"Dimensionality Reduction of Modulation Frequency Features for Speech Discrimination"*  
InterSpeech 2008, September 2008.
18. M. Markaki, A. Holzapfel and Y. Stylianou:  
*"Singing Voice Detection using Modulation Frequency Features"*  
ISCA Tutorial and Research Workshop on Statistical and Perceptual Audition, SAPA-2008, pp.7-10, September 2008.
19. M. Markaki and Y. Stylianou:  
*"Discrimination of Speech from nonspeech in broadcast news based on modulation frequency features"*  
ISCA ITRW, Speech Analysis and Processing for Knowledge Discovery,  
June 2008.
20. M. Markaki, A. Karpov, E. Apostolopoulos, M. Astrinaki, Y. Stylianou and A. Ronzhin:  
*"A Hybrid System for Audio Segmentation and Speech-endpoint Detection of Broadcast News"*  
SPECOM, October 2007.
21. M. Wohlmayr, M. Markaki and Y. Stylianou:  
*"Speech - Nonspeech Discrimination based on Speech-relevant Spectrogram Modulations"*  
EUSIPCO, September 2007.
22. Z. Inanoglu, M. Jottrand, M. Markaki, K. Stankovic, A. Zara, L. Arslan, T. Dutoit, I. Panzic, M. Saraclar and Y. Stylianou:  
*"Multimodal speaker identity conversion - continued"*  
eNTERFACE'07 Workshop on Multimodal Interfaces, July 2007.

23. M. Markaki, M. Wohlmayr and Y. Stylianou:  
*"Speech - Nonspeech Discrimination using the Information Bottleneck Method and Spectro-Temporal Modulation Index"*  
 InterSpeech 2007, pp.2913-2916, August 2007.
24. M.I. Taroudakis, M. Markaki and E. Mavritsaki:  
*"Matching modal arrivals in shallow water for tomographic inversions"*  
 5th European Conference on Underwater Acoustics, pp.1317-1322, 2000.
25. M.I. Taroudakis and M. Markaki:  
*"A Two-Phase matched-field processing scheme for bottom recognition, using broad-band acoustic data"*  
 4th European Conference on Underwater Acoustics, 1998.
26. M.I. Taroudakis and M. Markaki:  
*"Matched-field ocean acoustic tomography in a range-dependent environment"*  
 3rd European Conference on Underwater Acoustics, 1996.
27. M.I. Taroudakis and M. Markaki:  
*"Matched-field ocean acoustic tomography using genetic algorithms"*  
 Acoustical Imaging, vol.22, 1995.

#### CONFERENCE ABSTRACTS

28. M. Wohlmayr, M. Markaki and Y. Stylianou:  
*"Extracting speech-relevant spectrotemporal modulations using the information bottleneck method"*  
 AREADNE06 Abstr., [areadne.org/areadne06-final-program.pdf](http://areadne.org/areadne06-final-program.pdf), 2006.
29. M. Markaki and S. Orphanoudakis:  
*"Computational role of excitability's modulation in working-memory in a CA1 neuron"*  
 Computational & System Neurosciences 2005:[www.cosyne.org/program05/177.html](http://www.cosyne.org/program05/177.html).
30. M. Markaki and P. Poirazi:  
*"Role of selective coupling between calcium channels and calcium-dependent potassium channels in reduced excitability of aged CA1 neurons"*  
 FENS Abstr., vol.2, A158.6, 2004.
31. M.I. Taroudakis and M. Markaki:  
*"On the simultaneous estimation of current and sound velocity structure in the ocean, using matched-field processing"*  
 J. Acoustical Society of America, vol.105, no.2, pp.1177-1177,1999.
32. M.I. Taroudakis and M. Markaki:  
*"The behavior of different object functions in a matched-field processing scheme for bottom recognition: A case study"*  
 J. Acoustical Society of America, vol.104, no.3, pp.1740-1740,1998.

## BOOK CHAPTERS

33. M. Markaki, M. Wohlmayr and Y. Stylianou:  
"Extraction of speech-relevant information from modulation spectrograms"  
In Y. Stylianou, M. Faundez-Zanuy and A. Esposito (Eds.),  
Springer Lecture Notes in Computer Science: *Progress in Nonlinear  
Speech Processing*, Springer, ISBN 3540715037, 2007.

## SEMINARS - WORKSHOPS

- |              |   |
|--------------|---|
| January 2012 | "IEEE Winter School on Speech and Audio Processing for Immersive Environments and Future Interfaces",<br>FORTH-ICS, Heraklion, Crete, Greece  |
| June 2011    | "First Summer School on Computational Oncology",<br>Computational Medicine Lab, FORTH-ICS, Heraklion, Greece  |
| July 2007    | "SIMILAR Network of Excellence Summer workshop on Multimodal Interfaces", participation in the project: Multimodal Speaker Identity Conversion<br>Bogazici University, Istanbul, Turkey |
| July 2005    | "Summer school in Computational Physics", Physics Department, University of Crete<br>2nd prize in problems solving contest  |
| August 2004  | "Edinburgh Summer School in Neuroinformatics Simulation Tools", Institute for Adaptive and Neural Computation, School of Informatics, University of Edinburg, Scotland, UK              |