

## VITA

### **Maria Markaki**

#### **Education:**

**April 1992:** BS in Physics, University of Athens - Greek State Institution of Scholarships (I.K.Y.) scholarship for the admittance at the Physics Department.

**May 1996:** MS in Physics (Oceanography), University of Athens.

*Thesis Title:* Matched-field processing and hybrid algorithms for vertical slice tomography (in Greek language). *Advisors:* Prof. A. Laskaratos (Physics, Univ. of Athens) and Prof. M. Taroudakis (Mathematics, Univ. of Crete).

MSc thesis' research was funded by a grant from the Institute of Applied and Computational Mathematics - Foundation for Research and Technology - Hellas (FORTH-IACM).

**January - October 2001:** Graduate Program in Neurosciences, Director: Prof. A. Moschovakis, Medical School, University of Crete - study was funded by a grant from FORTH-IACM (no degree).

**April 2005:** MS in Computer Science, University of Crete - funded by an EPEAEK graduate student fellowship.

*Thesis title:* "Computational role of modulation of excitability in a CA1 hippocampal pyramidal neuron during aging". *Advisor:* S. Orphanoudakis, Prof., Computer Science Department, Univ. of Crete.

MSc thesis' research was funded by the Greek GSRT Program EPAN - "Aristeia", code number 1308/B1/3.3.1/317/12.04.2002, of the Institute of Computer Science - Foundation for Research and Technology - Hellas (FORTH-ICS).

**April 2005-present:** PhD student in Computer Science, University of Crete.

*Thesis title:* "Context-dependent extraction of maximally informative directions in multidimensional speech representations". *Advisor:* Prof. Y. Stylianou, Prof. G. Tziritas, Computer Science Department, Univ. of Crete, and Prof. P. Maragos, National Technical University of Athens.

#### **Seminars:**

**August 2004:** «Edinburgh Summer School in Neuroinformatics Simulation Tools», Institute for Adaptive and Neural Computation, School of Informatics, University of Edinburgh, Scotland, UK.

**July 2005:** Summer school in Computational Physics, Physics Department, University of Crete - 2nd prize in problems solving contest.

#### **Professional experience:**

**April 2005-2007:** Research assistant, Computer Science Department, University of Crete: SIMILAR Network of Excellence - Research in Human-Machine Multimodal Interfaces (Speech modality).

**2002-present:** Graduate teaching assistant in Computer Science Department, University of Crete, in courses of Applied Mathematics, Pattern recognition, Digital Signal Processing and Discrete-time Speech Processing.

**1995-2000:** Research assistant, Underwater Acoustics - Institute of Applied and Computational Mathematics - Foundation of Research and Technology Hellas (FORTH-IACM).

**Research interests:**

Pattern recognition, Speech processing, Signal processing.

**Publications**

**Journal Papers:**

- Taroudakis M.I. and Markaki M.G. "On the use of matched-field processing and hybrid algorithms for vertical slice tomography" *Journal of the Acoustical Society of America*, Vol. 102, pp. 885-895 (1997).
- Taroudakis M.I. and Markaki M.G. "Bottom geoacoustic inversions by broadband matched field processing" *Journal of Computational Acoustics*, Vol. 6, Nos 1 & 2, pp. 167-183 (1998).
- Taroudakis M.I. and Markaki M.G. "Bottom geoacoustic inversion by matched field processing - a sensitivity study" *Inverse Problems*, Vol 16, pp.1679-1692 (2000).
- Taroudakis M.I. and Markaki M.G. "Tomographic inversions in shallow water using modal travel time measurements" *ACTA ACUSTICA united with ACUSTICA*, Vol 87, pp 647-658 (2001).
- Markaki M., Orphanoudakis S. and Poirazi P. "Modeling reduced excitability in aged CA1 neurons as a calcium-dependent process" *Neurocomputing*, Vol 65-66, Issue C (Special issue), pp 305-314 (2005).
- Markaki M. and Stylianou Y., "Discrimination of Speech from Nonspeech in Broadcast News Based on Modulation Frequency Features" submitted to *Speech Communication* (2009).
- Markaki M. and Stylianou Y., "Voice Pathology Detection and Classification based on Joint Acoustic and Modulation Frequency" submitted to *IEEE Transactions on Biomedical Engineering* (2009).

**Refereed Conference Proceedings:**

- Taroudakis M.I. and Markaki M. "Matched-field Ocean Acoustic Tomography Using Genetic Algorithms" in *Acoustical Imaging*, edited by Piero Tortoli and Leonardo Masotti, Plenum Press, pp 601-606 (1996).
- Taroudakis, M.I. and Markaki, M.G. "Matched-field Tomography with a Genetic Algorithm Applied in Range-Dependent Environments" in *Proceedings of the 3rd European Conference on Underwater Acoustics*, edited by J.Papadakis, pp 779-784 (1996).
- Taroudakis M.I. and Markaki M.G. "A Two-Phase matched-field processing scheme for bottom recognition, using broad-band acoustic data" in *Proceedings of the 4th European Conference on Underwater Acoustics*, edited by A. Alippi and G.B. Cannelli pp 33-38(1998).
- Taroudakis M.I. and Markaki M. "On the simultaneous estimation of current and sound velocity structure in the ocean, using matched-field processing" in the special issue of *J. Acoust. Soc. Am.* 105, n<sub>o</sub>2 (1999) with the proceedings of a joint meeting: 137th regular meeting of Acoustical Society of America, 2nd convention of the EAA: Forum Acusticum and the 25th German Acoustics DAGA Conference.

- Taroudakis M.I., Markaki M and Mavritsaki E. "Matching modal arrivals in shallow water for tomographic inversions" in *Proceedings of the 5th European Conference on Underwater Acoustics*, edited by M.E.Zakharia, P. Chevret and P. Dubail pp 1317-1322 (2000).
- Markaki M., Wohlmayr M. and Stylianou Y. "Speech - Nonspeech Discrimination using the Information Bottleneck Method and Spectro-Temporal Modulation Index" in *Proceedings of InterSpeech ICSLP, Antwerp, Belgium, August 2007*.
- Wohlmayr M., Markaki M. and Stylianou Y. "Speech - Nonspeech Discrimination based on Speech-relevant Spectrogram Modulations" in *Proceedings of EUSIPCO-2007*.
- Markaki M., Karpov A., Apostolopoulos E., Astrinaki M., Stylianou Y. and Ronzhin A. "A Hybrid System for Audio Segmentation and Speech-endpoint Detection of Broadcast News" in *Proceedings of SPECOM, Moscow, Russia, October 2007*.
- Markaki M. and Stylianou Y. "Discrimination of Speech from nonspeech in broadcast news based on modulation frequency features" in *Proceedings of ISCA Tutorial and Research Workshop: Speech Analysis and Processing for Knowledge Discovery, Aalborg, Denmark, June 2008*.
- Markaki M., and Stylianou Y. "Dimensionality Reduction of Modulation Frequency Features for Speech Discrimination" in *Proceedings of InterSpeech, Brisbane, Australia, September 2008*.
- Markaki M., Holzapfel A. and Stylianou Y. "Singing Voice Detection using Modulation Frequency Features" in *Proceedings of ISCA Tutorial and Research Workshop on Statistical and Perceptual Audition – SAPA 2008, Brisbane, Australia, September 2008*.
- Markaki M. and Stylianou Y. "Evaluation of Modulation Frequency Features for Speaker Verification and Identification" in *Proceedings of EUSIPCO, Glasgow, Scotland, August 2009*.
- Markaki M., and Stylianou Y. "Using Modulation Spectra for Voice Pathology Detection and Classification" in *Proceedings of EMBS, Minnesota, USA, September 2009*.
- Markaki M., and Stylianou Y. "Normalized Modulation Spectral Features for Cross-Database Voice Pathology Detection" in *Proceedings of InterSpeech, Brighton, UK, September 2009*.
- Markaki M., and Stylianou Y. "Modulation Spectral Features for Objective Voice Pathology Assessment: the breathiness case" in *Proceedings of 6th International Workshop on Models and Analysis of Vocal Emissions for Biomedical Applications (accepted), Florence, Italy, 2009*.

#### **Conference Abstracts:**

- Markaki M. and Poirazi P. "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*.
- Markaki M. and Orphanoudakis S. "Computational role of excitability's modulation in working memory mechanisms in a CA1 neuron", *COSYNE05 Abstr., www.cosyne.org/program05/177.html, 2005*.

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- Wohlmayr M, Markaki M and Stylianou Y. "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

**Book Chapters :**

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

**Workshop Proceedings:**

- Inanoglu Z., Jottrand M., Markaki M., Stankovic K., Zara A., Arslan L., Dutoit T., Panzic I., Saraclar M., Stylianou Y. "Multimodal speaker identity conversion - continued" in Proceedings of the eNTERFACE'07 Workshop on Multimodal Interfaces, Istanbul, Turkey, July 16 - August 10, 2007.

**Personal data**

**Birth:** December 28, 1966, Heraklion, Greece.

**Marital status:**

Married with two children, 10 and 12 years old.

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