

Πρόεδρος Συμβουλίου Π.Κ κς Δ.Τεκριτζή - ΔΥ - Πρύτανης

14/2/13

ΠΟΛΥΤΕΧΝΕΙΟ ΚΡΗΤΗΣ	
Αρ. Πρωτ.	2309
Ημερομηνία	14-2-2013

ΑΙΤΗΣΗ

υποψηφιότητας για τη θέση του Πρύτανη
του Πολυτεχνείου Κρήτης

ΠΡΟΣ: Το Πολυτεχνείο Κρήτης

Θέμα: «Υποψηφιότητα
για τη θέση του Πρύτανη
του Π.Κ.».

Με την αίτησή μου αυτή υποβάλω υποψηφιότητα για
θέση του Πρύτανη του Πολυτεχνείου Κρήτης,
γνωρίζοντας τις προϋποθέσεις που ορίζει ο ν.
4009/2011 (Φ.Ε.Κ. 195/06.09.2011, τ. Α') άρθρο 8,
παράγραφος 15 για την υποβολή υποψηφιοτήτων.

Του Βασιλείου Διγαλάκη

Ειδικότερα, είναι σε γνώση μου ότι :

«Οι υποψήφιοι για τη θέση του Πρύτανη πρέπει να
είναι Καθηγητές πρώτης βαθμίδας ΑΕΙ της ημεδαπής ή
της αλλοδαπής, με ελληνική ιθαγένεια και άριστη
γνώση της ελληνικής γλώσσας, αναγνωρισμένο κύρος
και σημαντική διοικητική εμπειρία.».

Όνομα πατέρα
Βασίλειος

Με την παρούσα μου **επισυνάπτω:**

Όνομα μητέρας
Κορίνα

**α. Αντίγραφο Δελτίου Αστυνομικής Ταυτότητας ή
Διαβατηρίου**

Ιδιότητα
Καθηγητής Πολυτεχνείου Κρήτης

**β. Πλήρες Βιογραφικό Σημείωμα το οποίο θα το
αποστείλω και ηλεκτρονικά στη διεύθυνση:
dtsichritzis@isc.tuc.gr**

Τόπος γέννησης
Χανιά

**γ. Δήλωση Προθέσεων - Συστατικές Επιστολές και
οποιοδήποτε άλλο στοιχείο αναδεικνύει τα προσόντα
του υποψηφίου για την προς πλήρωση θέση.**

Έτος γέννησης
1963

Τόπος μόνιμης κατοικίας
Γαλατάς Χανίων

Τόπος / Ημερομηνία
Χανιά, 12/2/2013

ο δηλών / η δηλούσα



CURRICULUM VITAE

1. PERSONAL

Name Vassilis Digalakis
Date of Birth February 2, 1963
Place of Birth Chania, Greece
Email vas@telecom.tuc.gr
Skype vdigalakis
Work Address Technical University of Crete
Department of Electronics and Computer Engineering
Chania 73100, Crete, Greece
Tel. +30-28210-37226
Marital Status Married, two children

2. RESEARCH INTERESTS

Speech processing, speech recognition, robust speech recognition, dialog systems, multimodal interface systems.
Pattern recognition, machine learning, estimation theory.

3. EDUCATION

Boston University, Boston Mass.

Ph.D, Electrical Engineering, January 1992

Thesis: Segment-based Stochastic Models of Spectral Dynamics for Continuous Speech Recognition

Northeastern University, Boston, Mass

Master's Degree in Electrical Engineering, June 1988

Master Thesis: Three-dimensional linear prediction and its application in Digital Angiography

National Technical University of Athens

Diploma in Electrical Engineering, June 1986

4. CAREER

Telecommunication Systems Institute of Crete (TSI)

2005 – present: Director.

2000 – 2005: Deputy Director.

TSI (<http://www.tsi.gr/index.en.html>) is a legally independent University Research Institute affiliated with the Electronics and Computer Engineering (ECE) Department of the Technical University of Crete. Since 2003, TSI has led or participated in over 20 FP6/FP7 projects, more than 15 projects from the Greek Secretariat for Research and Technology, and several regional and smaller-scale R&D programs, funded by industry.

Currently there are over 20 active research projects at TSI (either as a partner or coordinator), with a total budget for TSI of approximately 5M Euros.

Technical University Of Crete, Chania

2003 – present: Director, Information and Communication Networks Lab, ECE Department.

2000 – present: Professor, Electronics and Computer Engineering Department.

2005 – 2007: Vice-Chairman, ECE Department.

2003 – 2005: Chairman, ECE Department.

1996 – 2000: Assistant Professor, Electronics and Computer Engineering Department.

Dialogos Speech Communications

1998 – 2012: Member of the board of directors.

Dialogos is a pioneering Greek high-technology startup company that provides services and integrated solutions in the area of call-center automation using speech recognition and speech synthesis. Dialogos is a partner of the worldwide leader in speech technology, Nuance Communications, and has developed the largest voice portals in Greece, such as MyCosmos of Cosmote, 1535 Health Line of OTE, customer care of HOL and the voice portal of Blue Star Ferries. Dialogos has localized the Nuance speech recognition engine in multiple languages, including Greek, Turkish, Arabic, Italian and Catalan Spanish. Dialogos, in partnership with Turkish integrators, deployed the first voice portals in Turkey in the financial and banking sectors. Dialogos is based in Chania and its personnel consists mainly of TUC graduates.

Stanford Research Institute (SRI International), Menlo Park, California

1992 – 1995: Sr. Research Engineer.

At SRI, Prof. Digalakis was a member of the Senior Staff and was principal investigator in several research projects funded by DARPA and the private sector. At SRI, he:

- Developed a speech-recognition based system for the automatic evaluation of pronunciation of non-native English speakers.
- Improved the accuracy of large-vocabulary speech recognition systems by modeling the time dependencies of the speech signal.
- Conducted research in the field of spoken-language translation and led a research program that developed an English to Swedish translation system in the field of air-travel information and planning (Air Travel Information System – ATIS).
- Invented a new method for acoustic modeling, Genones, which reduced the error rate of SRI's Decipher speech recognition system by 40%. This technique is the acoustic modeling component of the speech recognition engine used by Nuance Communications.
- Invented a new method for adapting a speech recognition system to individual speakers and acoustic environments.

Boston University, Boston, Mass.

1988 – 1991: Graduate research assistant.

Conducted research in segment-based acoustic modeling for speech recognition. Investigated models for longer time scale phenomena and the evolution of the spectral dynamics of speech.

Northeastern University, Boston, Mass.

1986 – 1988: Teaching and Research Assistant.

Taught laboratory courses in Electronic and Digital Signal Processing.
Designed VLSI structures for digital signal processing algorithms.

5. PROFESSIONAL ACTIVITIES

- Section Coordinator and Scientific Committee member in many International Conferences, including ICASSP, Eurospeech and Eusipco
- Participated, after invitation, in summer research workshops on robust speech recognition at Rutgers University. (Summers 1993, 1994)
- Led the research team on rapid speaker adaptation of speech recognition systems at the summer research workshop organized by the Johns Hopkins University in July-August 1998.
- ACM ICMI 2008, General Co-chair
- IEEE MMSP 2007, Technical Program Chair
- Reviewer in the journals:
 - IEEE Transactions on Signal Processing
 - IEEE Transactions on Speech and Audio Processing
 - IEEE Signal Processing Letters
 - Computer, Speech and Language
 - Computational Linguistics
 - Speech Communication

6. AWARDS

- He ranked second in the 1980 National entrance exams and was admitted to the Electrical Engineering department of the National Technical University of Athens.
- He was awarded "SRI's exceptional achievement award" for the invention of Genones, a new technique of acoustic modeling for large-vocabulary speech recognition systems.
- He was awarded the **IEEE Signal Processing Society Best Paper Award in 1999** for the publication "From HMMs to Segment Models: A Unified View of Stochastic Modeling for Speech Recognition".
- His PhD student, Vassilis Diakouloukas, was awarded the **IEEE Signal-Processing Society Young Author Best Paper Award in 2000** in the field of speech processing, for the publication: "Maximum-Likelihood Stochastic-Transformation Adaptation of Hidden Markov Models".

7. CITATIONS

According to Publish or Perish (based on Google Scholar), Prof. Digalakis has over **3.500 citations** and **h-index=30**:

Query: "V Digalakis": all
Query date: 2013-01-07
Papers: 122
Citations: 3565
Years: 25
Cites/year: 142.60
Cites/paper: 29.22
Cites/author: 1255.84
Papers/author: 46.82
Authors/paper: 3.32
h-index: 30

10 Most cited papers:

Cites	Authors	Title
613	M Ostendorf, VV Digalakis...	From HMM's to segment models: A unified view of stochastic modeling for speech recognition
299	VV Digalakis, D Rtischev...	Speaker adaptation using constrained estimation of Gaussian mixtures
195	V Digalakis, JR Rohlicek...	ML estimation of a stochastic linear system with the EM algorithm and its application to speech recognition
175	L Neumeyer, H Franco, V Digalakis, M Weintraub	Automatic scoring of pronunciation quality
169	VV Digalakis, P Monaco...	Genones: Generalized mixture tying in continuous hidden Markov model-based speech recognizers
149	H Murveit, J Butzberger, V Digalakis...	Large-vocabulary dictation using SRI's DECIPHER speech recognition system: Progressive search techniques
121	VV Digalakis, LG Neumeyer...	Quantization of cepstral parameters for speech recognition over the world wide web
115	H Franco, L Neumeyer, V Digalakis, O Ronen	Combination of machine scores for automatic grading of pronunciation quality
107	VV Digalakis, LG Neumeyer	Speaker adaptation using combined transformation and Bayesian methods
95	V Digalakis, H Murveit	GENONES: Optimizing the degree of mixture tying in a large vocabulary hidden markov model based speech recognizer

8. SCIENTIFIC WORK

I. BIOMEDICAL IMAGE PROCESSING

During his MSc thesis, he worked on image processing and biomedical imaging systems. The work involved implementation of image processing algorithms on DSP boards.

Selected publications:

V. Digalakis, V.K. Ingle, D.G. Manolakis, "Multidimensional Linear Prediction and its Application to Digital Angiography", *Multidimensional Systems and Signal Processing*, Vol. 4, 1993, pp. 307-329.

V. Digalakis, D. Manolakis, P. Lazaridis and V.K. Ingle, "Enhancement of Digital Angiographic Images with Misregistration Correction and Spatially-Adaptive Matched Filtering", *Visual Communications and Image Processing '92 Proceedings, SPIE Vol. 1818*, Boston, Massachusetts, November 1992, pp. 1264-1270.

V. Digalakis, D.G. Manolakis, V.K. Ingle and A.K. Kok, "Automatic adaptive contrast enhancement for radiological imaging", *Proceedings of IEEE International Symposium on Circuits and Systems*, Chicago, IL, May 1993, pp. 810-813.

II. SPEECH RECOGNITION: ACOUSTIC MODELING

Acoustic modeling for speech recognition has been one of his main research interests. The acoustic modeling component of a speech recognizer refers to the statistical models used to represent the speech signal for the various lexical units of the recognizer. In his PhD Thesis, he developed stochastic segment models for speech recognition that were based on linear dynamical system theory. The work on the stochastic segment models has been awarded with an IEEE Signal Processing Society best paper award. The segment models relax some of the incorrect conditional independence assumptions that are adopted by the dominant approach in speech recognition, hidden Markov modeling.

Selected publications:

M. Ostendorf, V. Digalakis and O. Kimball, "From HMMs to Segment Models: A Unified View of Stochastic Modeling for Speech Recognition", *IEEE Transactions Speech and Audio Processing*, Sept. 1996, pp. 360-378.

V. Digalakis, J.R. Rochlicek, M. Ostendorf, "A Dynamical System Approach to Continuous Speech Recognition", *Proceedings of the IEEE International Conference on Acoustics, Speech and Signal Processing*, Toronto, Canada, May 1991, pp. 289-292.

At SRI Prof. Digalakis continued his work on acoustic modeling. He invented "Genones", an algorithm that achieved the optimum trade-off between trainability and recognition performance for hidden Markov model-based speech recognizers. The algorithm was implemented in SRI's Decipher speech recognition system and reduced the recognition error rate by 40% in large-vocabulary speech recognition tasks. He

also worked on hybrid speech recognition systems that used Neural Networks as posterior-probability estimators for hidden Markov model-based speech recognizers.

Selected publications:

V. Digalakis, P. Monaco and H. Murveit, "Genones: Generalized Mixture Tying in Continuous Hidden Markov Model-Based Speech Recognizers", *IEEE Transactions Speech and Audio Processing*, June 1996, pp. 281-289.

V. Digalakis and H. Murveit, "Genones: Optimizing the Degree of Mixture-Tying in a Large-Vocabulary HMM-Based Speech Recognizer", *Proceedings of the IEEE International Conference on Acoustics, Speech and Signal Processing*, Adelaide, Australia, April 1994, pp. I-537 - I-540.

H. Franco and V. Digalakis, "Temporal Correlation Modeling in a Hybrid Neural Network/Hidden Markov Model Speech Recognizer", *Proceedings of European Conference on Speech Communication and Technology*, 1995.

At TUC, he continued research on acoustic modeling. Among the main research results were techniques to achieve comparable performance using discrete distributions at a much lower computational cost, and to train speech recognition systems for resource-poor languages, where there are not enough training data. Prof. Digalakis and his students also developed the first large-vocabulary continuous speech recognition system for the Greek language.

Selected publications:

V. Digalakis, S. Tsakalidis, C. Harizakis and L. Neumeyer, "Efficient Speech Recognition Using Subvector Quantization and Discrete Mixture HMMs," *Computer Speech and Language*, January 2000, pp.33-46.

N. Chatzichrisafis, V. Diakouloukas, V. Digalakis and C. Harizakis, "Gaussian Mixture Clustering and Language Adaptation for the Development of a New Language Speech Recognition System", *IEEE Transactions on Speech and Audio Processing*, Vol. 15, No. 3, March 2007, pp. 928 – 938.

V. Digalakis, D. Oikonomidis, D. Pratsolis, N. Tsourakis, C. Vosnidis, N. Chatzichrisafis and V. Diakouloukas, "Large Vocabulary Continuous Speech Recognition in Greek: Corpus and an Automatic Dictation System", *Proceedings of the European Conference on Speech Communication and Technology*, September 2003.

III. SPEECH RECOGNITION: SEARCH STRATEGIES

At SRI, Prof. Digalakis and his colleagues introduced first the progressive search framework. In this scheme, lower-complexity models are used in a first pass to reduce the search space into a lattice of possible hypotheses, which is then used by higher-complexity models to determine the final recognition hypothesis. Almost all research groups working on speech recognition later adopted this multi-pass approach.

The computational complexity of the search is critical for segment-based acoustic models, since the state-space is much larger than the traditional hidden Markov

models. In parallel to his work on acoustic modeling, he developed search algorithms for segment-based and dynamical-system acoustic models.

Selected publications:

H. Murveit, J. Butzberger, V. Digalakis and M. Weintraub, "Large-Vocabulary Dictation Using SRI's DECIPHERTM Speech Recognition System: Progressive-Search Techniques", Proceedings of the IEEE International Conference on Acoustic, Speech and Signal Processing, Minneapolis, Minnesota, April 1993, pp. II-319-II-322.

V. Digalakis, M. Ostendorf and J.R. Rohlicek, "Fast Algorithms for Phone Classification and Recognition Using Segment-Based Models", IEEE Transactions Signal Processing, Dec. 1992, pp. 2885-2896.

D. Oikonomidis, V. Diakouloukas and V. Digalakis, "A Sub-optimal Viterbi-like Search for Linear Dynamic Models Classification," Proceedings of Interspeech/Eurospeech 2007, Antwerp, Belgium, August 2007.

IV. SPEECH RECOGNITION: ROBUSTNESS AND ADAPTATION

The performance of speech recognition systems degrades dramatically when the conditions between the training and the testing data differ. In real-world environments, the noise and the environment variability have a significant impact on speech recognition performance. Prof. Digalakis has worked extensively on algorithms for robust speech recognition. He was the first to propose algorithms that adapted the parameters of speech recognizers to the channel and the speaker based on transformations. These algorithms required significantly less adaptation data than the previously used methods that were based on maximum a-posteriori estimation. In addition, the proposed transformation-based methods used automatic estimation methods and did not require parallel recordings of the different conditions. All modern speech recognizers currently use adaptation of their parameters based on transformation methods. The paper of his PhD student Vassilis Diakouloukas was awarded an IEEE Signal Processing Society best paper award.

Selected publications:

L. Neumeyer, V. Digalakis and M. Weintraub, "Training Issues and Channel Equalization Techniques for the Construction of Telephone Acoustic Models Using a High-Quality Speech Corpus", IEEE Transactions Speech and Audio Processing, Oct. 1994, pp. 590-597.

V. Digalakis, D. Rtischev and L. Neumeyer, "Speaker Adaptation Using Constrained Reestimation of Gaussian Mixtures", IEEE Transactions Speech and Audio Processing, Sept. 1995, pp. 357-366.

V. Diakouloukas and V. Digalakis, "Maximum-Likelihood Stochastic-Transformation Adaptation of Hidden Markov Models," IEEE Transactions Speech and Audio Processing, March 1999, pp.177-187.

V. SYSTEM IDENTIFICATION

The classical method to obtain maximum likelihood estimates of the parameters of a linear state-space system involves the construction of a time-varying Kalman predictor and the expression of the likelihood function in terms of the prediction error. The computation of the gradient of the log-likelihood function with respect to the system parameters becomes complicated in the multiple-output case. Prof. Digalakis was one of the first to observe that the identification problem would be simple if the state of the system were observable, and provide a solution for the ML identification of linear dynamical systems using the Expectation-Maximization algorithm.

Selected publications:

V. Digalakis, J.R. Rohlicek, M. Ostendorf, "ML Estimation of a Stochastic Linear System with the EM Algorithm and its Application to Speech Recognition", IEEE Transactions Speech and Audio Processing, Oct 1993, pp. 431-442.

V. Digalakis and K. C. Chou, "Maximum Likelihood Identification of Multiscale Stochastic Models Using the Wavelet Transform and the EM algorithm", Proceedings of the IEEE International Conference on Acoustics, Speech and Signal Processing, Minneapolis, Minnesota, April 1993, pp. IV-93-IV-96.

P. Papadopoulos and V. Digalakis, "Identification of Linear Systems in Canonical Form through an EM Framework", Proceedings of ICASSP 2010, Dallas, USA, 2010.

VI. SPEECH TRANSLATION

Prof. Digalakis worked on speech-to-speech translation from 1992 to 1999 in the Spoken Language Translator (SLT) project that was funded by Telia Research. SLT's long-term goal was the construction of practically useful systems capable of translating human speech from one language into another. The SLT prototype was capable of speech-to-speech translation between various pairs of languages in either direction within the domain of airline flight inquiries. The language-processing modules were generic in nature, were based on large, linguistically motivated grammars, and could fairly easily be tuned to give good performance in new domains. Non-experts using tools developed under the project could carry out much of the work involved in the domain adaptation process.

Selected publications:

M. Rayner, D. Carter, P. Bouillon, V. Digalakis, M. Wiren (Editors) "The Spoken Language Translator", Cambridge University Press, June 2000.

VII. LANGUAGE MODELING

Prof. Digalakis' worked on Statistical language modeling in the context of the Spoken Language Translator project, as well as in developing statistical language models for

inflectional languages like Greek. The latter adopted a maximum-entropy framework for the estimation of the language models.

Selected publications:

M. Rayner, D. Carter, V. Digalakis and P. Price, "Combining Knowledge Sources to Reorder N-Best Speech Hypothesis Lists", *Proceedings of the Human Language Technology Workshop*, Princeton, New Jersey, March 1994, pp. 212-217.

D. Oikonomidis and V. Digalakis, "Stem-based Maximum Entropy Language Models for Inflectional Languages", *Proceedings of the European Conference on Speech Communication and Technology*, September 2003

VIII. COMPUTER-AIDED LANGUAGE INSTRUCTION

In the area of computer-aided language instruction, Prof. Digalakis was one of the first to work on the automatic evaluation of pronunciation of non-native speakers. Speech recognition technology is key to the automatic evaluation of pronunciation quality. However, standard speech recognition algorithms were not designed with the goal of speech quality assessment; therefore, new methods and algorithms were devised to match the perceptual capabilities of human listeners to grade speech quality.

Selected publications:

L. Neumeyer, H. Franco, V. Digalakis and M. Weintraub, "Automatic Pronunciation Scoring of Foreign Language Student Speech," *Speech Communication*, February 2000, pp.83-93.

N. Moustroufas and V. Digalakis, "Automatic pronunciation evaluation of foreign speakers using unknown text", *Computer, Speech and Language*, January 2007.

IX. DISTRIBUTED SPEECH RECOGNITION – SMARTPHONE AND PDAs

Prof. Digalakis was one of the first in the speech recognition community to identify the capabilities of handheld devices (like smartphones and PDAs) and propose a distributed architecture for speech recognition systems, where part of the processing takes place on the device. Based on this architecture, the device performs feature extraction and transmits features to the server, where the recognition takes place. Google follows this approach today on its popular voice search.

Selected publications:

V. Digalakis, L. Neumeyer and M. Perakakis, "Quantization of Cepstral Parameters for Speech Recognition Over the World Wide Web," *IEEE Journal on Selected Areas in Communications*, January 1999, pp. 82-90.

9. TECHNOLOGY TRANSFER – PATENTS

Prof. Digalakis has significant experience on technology transfer. A large part of his research work is being used in deployed systems and has been involved in two startup companies:

- He was a member of the Senior Staff committee that founded Nuance Communications (NASDAQ:NUAN), the most successful startup company in the history of SRI International. Nuance Communications' speech recognition engine has been deployed in thousands of customers all over the world, and has served billions of telephone calls up to date.
- He was a member of the board of directors at Dialogos Speech Communications from 1998 to 2012, a pioneering high-tech startup at Chania that deployed the first speech recognition solutions in Greece and Turkey. Many TUC graduates have been working at Dialogos from 1998 until today.

Patents

- "Method and Apparatus for Speech Recognition Using Optimized Partial Mixture Tying of HMM State Functions" U.S. Patent No 5.825.978, 2001.
- "Method and apparatus for speech recognition adapted to an individual speaker", U.S. Patent No 5.864.810, 2001.
- "Method and apparatus for automatic text-independent grading of pronunciation for language instruction", U.S. Patent No 6.055.498, 2000.
- "Method and system for automatic text-independent grading of pronunciation for language instruction", U.S. Patent No 6.226.611, 1999.
- "Method and apparatus for automatic recognition using features encoded with product-space vector quantization", U.S. Patent No 6.256.607, 1998.

10. PUBLICATIONS

BOOKS:

M. Rayner, D. Carter, P. Bouillon, V. Digalakis, M. Wiren (Editors)
"The Spoken Language Translator",
Cambridge University Press, June 2000.

SCIENTIFIC JOURNALS AND BOOK CHAPTERS:

V. Digalakis, M. Ostendorf and J.R. Rohlicek,
"Fast Algorithms for Phone Classification and Recognition Using Segment-Based Models",
IEEE Transactions Signal Processing, Dec. 1992, pp. 2885-2896.

V. Digalakis, J.R. Rohlicek, M. Ostendorf,
"ML Estimation of a Stochastic Linear System with the EM Algorithm and its Application to
Speech Recognition",
IEEE Transactions Speech and Audio Processing, Oct 1993, pp. 431-442.

V. Digalakis, V.K. Ingle, D.G. Manolakis,
"Multidimensional Linear Prediction and its Application to Digital Angiography",
Multidimensional Systems and Signal Processing, Vol. 4, 1993, pp. 307-329.

L. Neumeyer, V. Digalakis and M. Weintraub,
"Training Issues and Channel Equalization Techniques for the Construction of Telephone
Acoustic Models Using a High-Quality Speech Corpus",
IEEE Transactions Speech and Audio Processing, Oct. 1994, pp. 590-597.

V. Digalakis, D. Rtischev and L. Neumeyer,
"Speaker Adaptation Using Constrained Reestimation of Gaussian Mixtures",
IEEE Transactions Speech and Audio Processing, Sept. 1995, pp. 357-366.

V. Digalakis, P. Monaco and H. Murveit,
"Genones: Generalized Mixture Tying in Continuous Hidden Markov Model-Based Speech
Recognizers",
IEEE Transactions Speech and Audio Processing, June 1996, pp. 281-289.

V. Digalakis and L. Neumeyer,
"Speaker Adaptation Using Combined Transformation and Bayesian Methods",
IEEE Transactions Speech and Audio Processing, June 1996, pp. 294-300.

M. Ostendorf, V. Digalakis and O. Kimball,
"From HMMs to Segment Models: A Unified View of Stochastic Modeling for Speech
Recognition",
IEEE Transactions Speech and Audio Processing, Sept. 1996, pp. 360-378

V. Digalakis, L. Neumeyer and M. Perakakis,
"Quantization of Cepstral Parameters for Speech Recognition Over the World Wide Web,"
IEEE Journal on Selected Areas in Communications, January 1999, pp. 82-90.

V. Diakouloukas and V. Digalakis,

"Maximum-Likelihood Stochastic-Transformation Adaptation of Hidden Markov Models,"
IEEE Transactions Speech and Audio Processing, March 1999, pp.177-187.

V. Digalakis,

"On-line Adaptation of Hidden Markov Models Using Incremental Estimation Algorithms,"
IEEE Transactions Speech and Audio Processing, May 1999, pp.253-261.

V. Digalakis, S. Tsakalidis, C. Harizakis and L. Neumeyer,

"Efficient Speech Recognition Using Subvector Quantization and Discrete Mixture HMMs,"
Computer Speech and Language, January 2000, pp.33-46.

L. Neumeyer, H. Franco, V. Digalakis and M. Weintraub,

"Automatic Pronunciation Scoring of Foreign Language Student Speech,"
Speech Communication, February 2000, pp.83-93.

H. Franco, L. Neumeyer, V. Digalakis and O. Ronen,

"Combination of Machine Scores for Automatic Grading of Pronunciation Quality,"
Speech Communication, February 2000, pp.121-130.

P. Stogiannos, A. Dollas and V. Digalakis,

"A Configurable Logic Based Architecture for Real-Time Continuous Speech Recognition
Using Hidden Markov Models,"
Journal of VLSI Signal Processing Systems, March 2000, pp.1-18.

M. Rayner, D. Carter, P. Bouillon, V. Digalakis, M. Wiren,

"The Spoken Language Translator,"
Spoken Language Translator, Cambridge University Press, June 2000.

V. Digalakis and H. Franco,

"Speech Recognition,"
Spoken Language Translator, Cambridge University Press, June 2000.

V. Digalakis and L. Neumeyer,

"Acoustic Modeling,"
Spoken Language Translator, Cambridge University Press, June 2000.

R. Eklund, J. Kaja, L. Neumeyer, V. Digalakis,

"Porting a Recognizer to a New Language,"
Spoken Language Translator, Cambridge University Press, June 2000.

V. Digalakis and L. Neumeyer,

"Multiple Languages and Dialects,"
Spoken Language Translator, Cambridge University Press, June 2000.

M. Rayner, D. Carter, P. Bouillon, V. Digalakis, M. Wiren,

"Conclusions," *Spoken Language Translator*, Cambridge University Press, June 2000.

C. Boulis, V. Diakouloukas, V. Digalakis,

"Maximum Likelihood Stochastic Transformations Adaptation for Medium and Small Data
Sets",
Computer Speech and Language, July 2001, pp. 257-287.

N. Moustroufas and V. Digalakis,

"Automatic pronunciation evaluation of foreign speakers using unknown text",
Computer, Speech and Language, January 2007.

N. Chatzichrisafis, V. Diakouloukas, V. Digalakis and C. Harizakis,
"Gaussian Mixture Clustering and Language Adaptation for the Development of a New
Language Speech Recognition System",
IEEE Transactions on Speech and Audio Processing, Vol. 15, No. 3, March 2007, pp. 928 –
938.

Refereed Conference Publications:

V. Digalakis and V.K. Ingle,
"A New-Three-Dimensional Linear Predictive Algorithm for Digital Subtraction
Angiography",
Proceedings of Fifteenth Annual Northeast Bioengineering Conference, Boston,
Massachusetts, March 1989.

V. Digalakis, M. Ostendorf and J.R. Rohlicek,
"Improvements in the Stochastic Segment Model for Phoneme Recognition",
Proceedings of the DARPA Speech and Natural Language Workshop, Cape Cod,
Massachusetts, Oct. 1989, pp. 332-338.

V. Digalakis, M. Ostendorf, J.R. Rohlicek,
"Fast Search Algorithms for Connected Phone Recognition Using the Stochastic Segment
Model",
Proceedings of the DARPA Speech and Natural Language Workshop, June 1990, pp. 173-
178.

V. Digalakis, J.R. Rohlicek, M. Ostendorf,
"A Dynamical System Approach to Continuous Speech Recognition",
Proceedings of the IEEE International Conference on Acoustics, Speech and Signal
Processing, Toronto, Canada, May 1991, pp. 289-292.

V. Digalakis,
"Maximum Likelihood Identification of a Dynamic System Model for Speech Using the EM
Algorithm",
Proceedings of the IEEE International Symposium on Information Theory, Budapest,
Hungary, June 1991, pp. 134.

M. Ostendorf and V. Digalakis,
"The Stochastic Segment Model for Continuous Speech Recognition",
Proceedings of Twenty-fifth Asilomar Conference on Signals, Systems and Computers,
Asilomar, California, November 1991, pp. 964-968.

V. Digalakis, D. Manolakis, P. Lazaridis and V.K. Ingle,
"Enhancement of Digital Angiographic Images with Misregistration Correction and Spatially-
Adaptive Matched Filtering",
Visual Communications and Image Processing '92 Proceedings, SPIE Vol. 1818, Boston,
Massachusetts, November 1992, pp. 1264-1270.

V. Digalakis and K. C. Chou,
"Maximum Likelihood Identification of Multiscale Stochastic Models Using the Wavelet
Transform and the EM algorithm",
Proceedings of the IEEE International Conference on Acoustics, Speech and Signal
Processing, Minneapolis, Minnesota, April 1993, pp. IV-93-IV-96.

H. Murveit, J. Butzberger, V. Digalakis and M. Weintraub,
"Large-Vocabulary Dictation Using SRI's DECIPHERTM Speech Recognition System:
Progressive-Search Techniques",
Proceedings of the IEEE International Conference on Acoustic, Speech and Signal
Processing, Minneapolis, Minnesota, April 1993, pp. II-319-II-322.

With M. Rayner et al.,
"A Speech to Speech Translation System Built from Standard Components",
Proceedings of the Human Language Technology Workshop, Princeton, New Jersey, March
1993, pp 217-222.

V. Digalakis and H. Murveit,
"Genomes: Optimizing the Degree of Mixture-Tying in a Large-Vocabulary HMM-Based
Speech Recognizer",
Proceedings of the IEEE International Conference on Acoustics, Speech and Signal
Processing, Adelaide, Australia, April 1994, pp. I-537 - I-540.

V. Digalakis and H. Murveit,
"High-Accuracy Large-Vocabulary Speech Recognition Using Mixture-Tying and
Consistency Modeling",
Proceedings of the Human Language Technology Workshop, Princeton, New Jersey, March
1994, pp. 292-297.

M. Rayner, D. Carter, V. Digalakis and P. Price,
"Combining Knowledge Sources to Reorder N-Best Speech Hypothesis Lists",
Proceedings of the Human Language Technology Workshop, Princeton, New Jersey, March
1994, pp. 212-217.

H. Murveit, P. Monaco, V. Digalakis and J. Butzberger,
"Techniques to Achieve an Accurate Real-Time Large-Vocabulary Speech Recognition
System",
Proceedings of the Human Language Technology Workshop, Princeton, New Jersey, March
1994, pp. 368-373.

M. Weintraub, L. Neumeyer and V. Digalakis,
"SRI November 1993 CSR Spoke Evaluation",
Proceedings of the ARPA Spoken Language Systems Technology Workshop, Princeton, New
Jersey, March 1994.

V. Digalakis and L. Neumeyer,
"Fast Speaker Adaptation Using Constrained Reestimation of Gaussian Mixtures",
Proceedings of the ARPA Spoken Language Systems Technology Workshop, Austin, Texas,
February 1995.

V. Digalakis, M. Weintraub, A. Sankar, H. Franco, L. Neumeyer, and H. Murveit,
"Continuous Speech Dictation on ARPA's North American Business News Domain",
Proceedings of the ARPA Spoken Language Systems Technology Workshop, Austin, Texas,
February 1995.

V. Digalakis and L. Neumeyer,
"Speaker Adaptation Using Combined Transformation and Bayesian Methods",
Proceedings of the IEEE International Conference on Acoustic, Speech and Signal
Processing, May 1995.

A. Sankar, F. Beaufays and V. Digalakis,

"Training Data Clustering for Improved Speech Recognition",
Proceedings of European Conference on Speech Communication and Technology, 1995.

H. Franco and V. Digalakis,
"Temporal Correlation Modeling in a Hybrid Neural Network/Hidden Markov Model Speech Recognizer",
Proceedings of European Conference on Speech Communication and Technology, 1995.

V. Diakouloukas, V. Digalakis, L. Neumeyer and J. Kaja,
"Development of Dialect-Specific Speech Recognizers Using Adaptation Methods",
Proceedings of the IEEE International Conference on Acoustics, Speech and Signal Processing, April 1997.

V. Diakouloukas and V. Digalakis,
"Adaptation of Hidden Models Using Multiple Stochastic Transformations",
Proceedings of the IEEE International Conference on Speech Communication and Technology, Sept. 1997.

V. Digalakis,
"On-line Adaptation of Hidden Markov Models Using Incremental Estimation Algorithms",
Proceedings of European Conference on Speech Communication and Technology, Sept. 1997.

T. Salonidis and V. Digalakis,
"Robust Speech Recognition for Multiple Topological Scenarios of the GSM Mobile Phone System",
Proceedings of IEEE International Conference on Acoustics, Speech and Signal Processing, May 1998.

K. Koumpis, V. Digalakis and H. Murveit,
"Design and Implementation of an Auto-attendant System for the T.U.C. Campus Using Speech Recognition",
Proceedings of IEEE International Conference on Acoustics, Speech and Signal Processing, May 1998

V. Digalakis, L. Neumeyer and M. Perakakis,
"Quantization of Cepstral Parameters for Speech Recognition over the World Wide Web",
Proceedings of IEEE International Conference on Acoustics, Speech and Signal Processing, May 1998.

V. Digalakis, V. Doumptotis and S. Tsakalidis,
"On the Integration of Dialect and Speaker Adaptation in a Multi-Dialect Speech Recognition System",
Proceedings of European Signal Processing Conference EUSIPCO-98, Sept. 1998.

L. Neumeyer, H. Franco, V. Abrash, L. Julia, O. Ronen, H. Bratt, J. Bing, V. Digalakis, and Marikka Rypa,
"WebGrader(TM): A Multilingual Pronunciation Practice Tool",
Proc. Speech Technology in Language Learning Workshop, Stockholm, Sweden, 1998.

V. Digalakis et al,
"Rapid Speech Recognizer Adaptation to New Speakers",
Proceedings of IEEE International Conference on Acoustics, Speech and Signal Processing, March 1999.

E. Bocchieri, V. Digalakis, A. Corduneanu and C. Boulis,

"Correlation Modeling Of MLLR Transform Biases For Rapid HMM Adaptation To New Speakers",
Proceedings of IEEE International Conference on Acoustics, Speech and Signal Processing,
March 1999.

S. Tsakalidis, V. Digalakis and L. Neumeyer,
"Efficient Speech Recognition Using Subvector Quantization and Discrete Mixture HMMs",
Proceedings of IEEE International Conference on Acoustics, Speech and Signal Processing,
March 1999.

V. Digalakis, S. Tsakalidis and L. Neumeyer,
"Reviving Discrete HMMs: The Myth About the Superiority of Continuous HMMs",
Proceedings of European Conference on Speech Communication and Technology, September
1999.

C. Boulis and V. Digalakis,
"Fast Speaker Adaptation of Large Vocabulary Continuous Density HMM Speech
Recognizer Using a Basis Transform Approach",
Proceedings of IEEE International Conference on Acoustics, Speech and Signal Processing,
June 2000.

C. Vosnidis and V. Digalakis,
"Use of Clustering Information for Coarticulation Compensation in Speech Synthesis by
Word Concatenation",
Proceedings of European Conference on Speech Communication and Technology, September
2001.

*V. Digalakis, D. Oikonomidis, D. Pratsolis, N. Tsourakis, C. Vosnidis, N. Chatzichrisafis and
V. Diakouloukas,*
"Large Vocabulary Continuous Speech Recognition in Greek: Corpus and an Automatic
Dictation System",
Proceedings of the European Conference on Speech Communication and Technology,
September 2003.

D. Oikonomidis and V. Digalakis,
"Stem-based Maximum Entropy Language Models for Inflectional Languages",
Proceedings of the European Conference on Speech Communication and Technology,
September 2003.

N. Chatzichrisafis, V. Digalakis, V. Diakouloukas and C. Harizakis,
"Rapid Acoustic Model Development using Gaussian Mixture Clustering and Language
Adaptation",
Interspeech 2004, Korea, October 2004.

Nikos Tsourakis, Dimitris Pratsolis, Costas Harizakis and Vassilis Digalakis,
"An Architecture for Multimodal Applications Over Wireless Data Networks",
International Conference of Intelligent Environments, Athens, Greece, July 2006.

G. Tsontzos, V. Diakouloukas, C. Coniaris and V. Digalakis,
"Estimation of General Identifiable Linear Dynamic Models with an Application in Speech
Recognition",
Proceedings of ICASSP 2007, Hawaii, USA, April 2007.

N. Tsourakis and V. Digalakis,

"A Generic Methodology of Converting Transliterated Text To Phonetic Strings. Case Study: Greeklish",

Proceedings of Interspeech/Eurospeech 2007, Antwerp, Belgium, August 2007.

D. Oikonomidis, V. Diakouloukas and V. Digalakis,

"A Sub-optimal Viterbi-like Search for Linear Dynamic Models Classification,"

Proceedings of Interspeech/Eurospeech 2007, Antwerp, Belgium, August 2007.

D. Pratsolis, N. Tsourakis and V. Digalakis,

"Degradation of Speech Recognition Performance over Lossy Data Networks",

Third ACM International Workshop on Wireless Multimedia Networking and Performance Modeling (WMuNeP), October 2007, Chania, Greece.

P. Papadopoulos and V. Digalakis,

"Identification of Linear Systems in Canonical Form through an EM Framework",

Proceedings of ICASSP 2010, Dallas, USA, 2010.

A. Georgogiannis and V. Digalakis,

"Speech Emotion Recognition Using Non-Linear Teager Energy Based Features in Noisy Environments,"

Proceedings of 20th European Signal Processing Conference (EUSIPCO 2012), Bucharest, Romania, August 2012.

11. FUNDED RESEARCH:

- Research projects in which Prof. Digalakis was principal investigator:

“Spoken Language Translation”,

SRI Project ECC 92-120, June 1992 – December 1994. Funded by Telia Research, US\$ 200.000.

“High Performance Speech Recognition Using Consistency Modeling”,

SRI Project ECU 3773, Contract ONR N000014-92-C-0154, August 1992 – November 1994. Funded by ARPA, US\$ 1.754.807.

“Hierarchical Consistency Modeling for Next-Generation Speech Recognition”,

SRI Project ECU 93-033, Contract N66001-94-C-6048, August 1994 – December 1994. Funded by ARPA, US\$ 400.000.

“Dialect Adaptation and Speaker / Channel Normalization in a Spoken Language Translator”,

TUC Project, December 1995 – June 1999. Funded by SRI International και Telia Research, US\$ 218.260.

“Λογοτυπογραφία”,

TUC Project (Coordinator), 1999 –2001. Funded by GSRT, 440.000 €.

“Beware”,

TUC Project, Funded by Region of Crete, 108.000 €.

ΠΕΝΕΔ 2003: Multimodal development platform with integrated services of voice recognition and synthesis for embedded devices, 180.000 €.

ΑΚΜΩΝ 2008: «Development of infrastructure and expertise to provide services to Communication Networks», 2006 – 2008, 164.500 €.

- Research projects in which Prof. Digalakis was co-investigator:

“Development of an Autograder System for Foreign Language Student Speech”,

SRI Project, Funded by NTT Data Communications.

“Speech Modeling With Neural Networks”,

SRI Project, Funded by DARPA.

“Combining Linguistic and Statistical Technology for Improved Spoken Language Understanding”,

SRI Project, Funded by DARPA.

“HIWIRE”,

TUC Project, Funded by European Commission

“MUSCLE”,

TUC Project, Funded by European Commission

11. TEACHING

Undergraduate Courses

- Digital Communication Systems – Fall 1995-96, 1996-97, 1997-98
- Analog Communication Systems – Spring 1995-96, 1996-97, 1997-98, 1998-99, 1999-2000, 2000-01, 2001-02, 2002-03
- Introduction to Speech Processing – Fall 1996-97, 1997-98, 1998-99, 1999-2000, 2000-01, 2001-02, 2002-03, Spring 2003-04, 2005-06, Fall 2006-07, 2007-08, 2008-09, 2009-10
- Information Theory and Coding – Spring 2005-06
- Probability and Random Processes – Spring 2006-07, 2007-08, 2008-09, 2009-10, 2010-11, 2011-12
- Statistical Modeling and Pattern Recognition – Fall 2008-09, 2010-11, 2011-12
- Signals and Systems – Fall 2012-13

Graduate Courses

- Speech Processing – Fall 1999-2000, 2001-02
- Advanced Topics in Speech Processing – Spring 2003-04, 2005-06, 2006-07, 2007-08, 2008-09, 2009-10, 2011-12
- Machine Learning – Spring 2010-11

12. STUDENT SUPERVISION

Prof. Digalakis has supervised over 30 undergraduate diploma theses.

Graduate Student Supervision:

Vassilis Diakouloukas, PhD, TUC, awarded 2000.

“Transformation-based adaptation of hidden-Markov-model based speech recognizers”.

Dimitris Oikonomidis, PhD Candidate,

“Statistical Language Modeling”.

Costas Boulis, MSc, TUC, awarded 2000,

“Speaker adaptation techniques for continuous speech recognizers using medium and small adaptation data sets”.

Nikos Chatzichrisafis, MSc, TUC, awarded 2001,

“Cross language transfer and language adaptation”.

Dimitris Oikonomidis, MSc, TUC, awarded 2002,

“Language Models for Speech Recognition”.

Manolis Perakakis, MSc, TUC, awarded 2003,
"A 2Kbps Speech Coding Scheme for Distributed Speech Recognition on PDAs in Real Time".

Chris Vosnidis, MSc, TUC, awarded 2004,
"Robust Speech Synthesis".

Petros Gavalakis, MSc, TUC, awarded, 2004,
"Clustering techniques at the subvector level for Discrete-Mixture HMM acoustic models".

Dimitris Pratsolis, MSc, TUC, awarded, 2006,
"Proposal and Evaluation of a Multi-modal Services Platform over Mobile data networks,"

Nikos Tsourakis, MSc, TUC, awarded, 2006,
"Proposal and Evaluation of a Multi-modal Services Platform over Mobile data networks,"

Christos Koniaris, MSc, TUC, awarded, 2007,
"Estimation of General Identifiable State-Space Models,"

Orfeas Tsergoulas, MSc, TUC, awarded, 2009,
"A Greek broadcast news transcription system,"

Pavlos Papadopoulos, MSc, TUC, awarded, 2009,
"Identification of Linear Systems in Canonical Form with the Expectation-Maximization Algorithm."

Alexandros Georgogiannis, MSc, TUC, in progress,