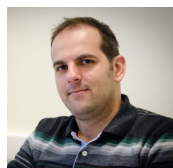# Ioannis (Yannis) Pantazis

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## Appointments & Education

***Assistant Researcher (Feb. 2018 – Now).*** Institute of Applied and Computational Mathematics, Foundation for Research and Technology - Hellas (IACM/FORTH)

Research Interests: Applied Probability, Stochastic Modelling, Statistical Inference, Signal/Speech Processing, Machine Learning, Sensitivity Analysis, Uncertainty Quantification

***Postdoctoral Research Associate (Jul. 2015 – Dec. 2017).*** Computer Science Department, University of Crete

> Title: Next Generation Causal Analysis Inspired by the Induction of Biological Pathways from Cytometry Data
> Employer: Ioannis Tsamardinos
> Field: Dynamical Systems, Sparse Inference, Systems Biology

***Postdoctoral Research Associate (Jun. 2014 – Jun. 2015).*** Dep. of Mathematics and Statistics, Univ. of Massachusetts, Amherst

> Title: Mathematical Foundations for Uncertainty Quantification in Materials Design
> Supervisor: Markos Katsoulakis
> Field: Applied Mathematics, Probability Theory, Stochastic Processes

***Greek Army (Sep. 2013 – May 2014).*** Serving at the Information Technology and Research Office

***Postdoctoral Research Associate (Sep. 2010 – Aug. 2013).*** Dep. of Mathematics and Statistics, Univ. of Massachusetts, Amherst

> Title: Hierarchical Stochastic Algorithms for Materials Engineering
> Supervisor: Markos Katsoulakis
> Field: Computational Mathematics, Applied Probability, Stochastic Processes

***Ph.D. (Sep. 2006 – Jul. 2010).*** Computer Science Department, University of Crete

> Title: Decomposition of AM-FM Signals with Applications in Speech Processing
> Supervisor: Yannis Stylianou
> Field: Speech Processing, Speech Analysis/Synthesis, Signal Processing

***M.Sc. (Sep. 2004 – Sep. 2006).*** Computer Science Department, University of Crete

> Title: Detection of Discontinuities in Concatenative Speech Synthesis
> Supervisor: Yannis Stylianou
> Field: Speech Processing, Pattern Recognition

***B.Sc. (Sep. 2000 – Sep. 2004).*** Computer Science Department, University of Crete

# Publications

## Journals

14. "Sensitivity Analysis for Rare Events based on Renyi Divergence", P. Dupuis, M.A. Katsoulakis, Y. Pantazis and L. Rey-Bellet, Annals of Applied Probability, 2019

13. "A Unified Approach for Sparse Dynamical System Inference from Temporal Measurements", Y. Pantazis and I. Tsamardinos, Bioinformatics, 2019

12. "Gaussian Asymptotic Limits for the $\alpha$-transformation in the Analysis of Compositional Data", Y. Pantazis, M. Tsagris and A. Wood, Sankhya A, 2019

11. "Summary Results of the 2014-2015 DARPA Chikungunya Challenge", S.Y. Del Valle, B.H. McMahon, J. Asher, R. Hatchett, J. Lega, H.E. Brown, M. Leany, Y. Pantazis, D.J. Roberts, S. Moore, A.T. Peterson, L.E. Escobar, H. Qiao, N.W. Hengartner, H. Mukundan, BMC Infectious Diseases, 2018

10. "ISAP: MATLAB Package for Sensitivity Analysis of High-Dimensional Stochastic Chemical Networks", W. Hu, Y. Pantazis and M. Katsoulakis, Journal of Statistical Software, 2018

9. "Path-space Information Bounds for Uncertainty Quantification and Sensitivity Analysis of Stochastic Dynamics", P. Dupuis, M.A. Katsoulakis, Y. Pantazis and P. Plechac, SIAM J. on Uncertainty Quantification, 2016

8. "Parametric Sensitivity Analysis for Stochastic Molecular Systems using Information Theoretic Metrics" A. Tsourtis, Y. Pantazis, M.A. Katsoulakis and E. Harmandaris, Journal of Chemical Physics , 2015

7. "Strategies for Parametric Sensitivity Analysis in Large-scale Reaction Networks", G. Arampatzis, M.A. Katsoulakis and Y. Pantazis, PLoS ONE , 2015

6. "Measuring the Irreversibility of Numerical Schemes for Reversible Stochastic Differential Equations", M.A. Katsoulakis, Y. Pantazis and L. Rey-Bellet, ESAIM: Mathematical Modelling and Numerical Analysis, 2014

5. "Parametric Sensitivity Analysis for Biochemical Reaction Networks based on Pathwise Information Theory", Y. Pantazis, M.A. Katsoulakis and D.G. Vlachos, BMC Bioinformatics, 2013

4. "A Relative Entropy Rate Method for Path Space Sensitivity Analysis of Stationary Complex Stochastic Dynamics", Y. Pantazis and M.A. Katsoulakis, J. of Chemical Physics, 138, 054115, 2013

3. "Adaptive AM-FM Signal Decomposition with Application to Speech Analysis", Y. Pantazis, O. Rosec and Y. Stylianou, IEEE Trans. on Audio, Speech and Language Processing, pg. 290–300, 2011

2. "Reply to the "Comments for 'Iterative Estimation of Sinusoidal Signal Parameters'"", Y. Pantazis, O. Rosec and Y. Stylianou, IEEE Signal Processing Letters , pg. 1024–1026, 2010

1. "Iterative Estimation of Sinusoidal Signal Parameters", Y. Pantazis, O. Rosec and Y. Stylianou, IEEE Signal Processing Letters, pg. 461–464, 2010

## Conferences

21. "Towards a robust and accurate screening tool for dyslexia with data augmentation using GANs", T. Asvestopoulou, V. Manousaki, A. Psistakis, E. Nikolli, V. Andreadakis, I. Aslanides, Y. Pantazis, I. Smyrnakis, M. Papadopouli, IEEE BioInformatics and BioEngineering, 2019

20. "Speech Enhancement for Noise-Robust Speech Synthesis using Wasserstein GAN", N. Adiga, Y. Pantazis, V. Tsiaras and Y. Stylianou, INTERSPEECH, 2019

19. "Non-parallel Voice Conversion using Weighted Generative Adversarial Networks", D. Paul, Y. Pantazis and Y. Stylianou, INTERSPEECH, 2019

18. "An information system for the detection of water leaks in municipal water networks", P. Prastacos, M. Diamandakis, M. Kosmadakis, I. Dafermos, Y. Kamarianakis and Y. Pantazis, AGILE, 2019

17. "Training Generative Adversarial Networks with Weights", Y. Pantazis, D. Paul, M. Fasoulakis and Y. Stylianou, EUSIPCO, 2019

16. "Connections between Reassigned Spectrum and Least Squares Estimation for Sinusoidal Models", Y. Pantazis, V. Tsiaras and Y. Stylianou, EUSIPCO, 2019

15. "Pathwise Sensitivity Analysis in Transient Regimes", G. Arampatzis, M. Katsoulakis, Y. Pantazis, RMMC proceedings , 2015

14. "An extension of the adaptive Quasi-Harmonic Model", G.P. Kafentzis, Y. Pantazis, O. Rosec and Y. Stylianou, ICASSP , 2012

13. "Tremor in Speakers with Spasmodic Dysphonia", M. Koutsogiannaki, Y. Pantazis, Y. Stylianou and P. Dejonckere, MAVEBA, 2011

12. "Fast Least-Squares Solution for Sinusoidal, Harmonic and Quasi-Harmonic Models", G. Tzedakis, Y. Pantazis, O. Rosec and Y. Stylianou, INTERSPEECH, 2010

11. "Analysis/Synthesis of Speech based on an Adaptive Quasi-Harmonic plus Noise Model", Y. Pantazis, G. Tzedakis, O. Rosec and Y. Stylianou, ICASSP , 2010

10. "On the Robustness of the Quasi-Harmonic Model of Speech", Y. Pantazis, O. Rosec and Y. Stylianou, ICASSP , 2010

9. "A Novel Method for the Extraction of Vocal Tremor", Y. Pantazis, M. Koutsogiannaki and Y. Stylianou, MAVEBA, 2009

8. "AM-FM Estimation for Speech Based on a Time-Varying Sinusoidal Model", Y. Pantazis, O. Rosec and Y. Stylianou, Interspeech , 2009

7. "Chirp Rate Estimation of Speech based on a Time-Varying Quasi-Harmonic Model", Y. Pantazis, O. Rosec and Y. Stylianou, ICASSP , 2009

6. "On the Properties of a Time-Varying Quasi-Harmonic Model of Speech", Y. Pantazis and Y. Stylianou, Interspeech , 2008

5. "On the Estimation of the Speech Harmonic Model", Y. Pantazis, O. Rosec and Y. Stylianou, ISCA, 2008

4. "Improving the Modeling of the Noise Part in the Harmonic Plus Noise Model of Speech", Y. Pantazis and Y. Stylianou, ICASSP , 2008

3. "Review in the Detection of Discontinuities in Concatenative Speech Synthesis", Y. Pantazis and Y. Stylianou, WNSP'05

2. "Discontinuity Detection in Concatenated Speech Synthesis Based on Nonlinear Speech Analysis", Y. Pantazis Y. Stylianou and E. Klabbers, INTERSPEECH, 2005

1. "Non Linear Speech Features for the Objective Detection of Discontinuities in Concatenative Speech Synthesis", Y. Pantazis and Y. Stylianou, WNSP'04

**Under Review, Preprints and Reports**

3. "A Universal Latent Feature Representation for Gene Expressions Improves Phenotypic Predictions", Y. Pantazis, C. Tselas, K. Lakiotaki, V. Lagani and I. Tsamardinos (submitted to BMC Bioinformatics)

2. "Enumerating Multiple Equivalent Lasso Solutions", Y. Pantazis, V. Lagani, P. Charonyktakis and I. Tsamardinos (preprint: http://arxiv.org/abs/1710.04995)

1. "GMM-Based Multimodal Biometric Verification", Y. Stylianou, Y. Pantazis, F. Calderero, P. Larroy, F. Severin, S. Schimke, R. Bonal, F. Matta, and A. Valsamakis, ENTERFACE'05 (project report), 2005

## Talks & Posters

"Uncovering Conspiracy Theories: How to Deal with Latent Confounders in Dynamical Systems", SIAM DS, Snowbird, 2019

"A Unified Approach for Sparse Inference of Dynamical Systems from Temporal Measurements", CECAM Workshop, Lausanne, 2019

"Sparse Inference of Dynamical Systems with Application in Natural Sciences", YSC, Heraklion 2018

"Tutorial on Generative Adversarial Networks (GANs)", SPCC, Heraklion, 2018

"Latent Feature Space Construction for Gene Expression Data with Improved Predictive Power on Newly-seen Datasets", HBio Conference, Heraklion, 2017

"Information-theoretic Uncertainty and Sensitivity Bounds for Stochastic Dynamics and Rare Events", Scaling Cascades in Complex Systems, Berlin, 2017

"Sensitivity Analysis, Uncertainty Quantification and Inference in Stochastic Dynamics", Workshop on UQ, Los Angeles, 2016

"Pathwise Information-theoretic Metrics for Parametric Sensitivity Analysis of Stochastic Reaction Networks", Workshop on Reaction Network Theory, Copenhagen, 2015

"Modeling Stochastic Dynamics for Biochemical Reaction Networks", CAUSALPATH Workshop, Heraklion, 2015

"Pathwise Sensitivity Analysis of Complex Stochastic Dynamics Based on Relative Entropy Rate", SIAM MS, Philadelphia. 2013

"Information-based parametric sensitivity analysis for stationary complex stochastic dynamics", SIAM CSE, Boston. 2013

"Applying Path-wise Relative Entropy in Numerical SDEs and in Sensitivity Analysis", Non-equilibrium StatMech Workshop, Banff, 2012

"Controlled-Error Langevin Approximations of Surface Diffusion Processes", ICIAM, Vancouver, 2011

"Controlled-error Approximations of Surface Diffusion with Application to Pattern Formation", Coarse-Graining Workshop, Heraklion, 2011

"Controlled-Error Semi-discretization of Mesoscopic Stochastic Equations for Surface Diffusion", FoCM, Budapest, 2011

"A Novel Method for the Extraction of Vocal Tremor", MAVEBA, Florence, 2009

"On the Properties of a Time-Varying Quasi-Harmonic Model of Speech", INTERSPEECH, Brisbane, 2008

"On the Estimation of the Speech Harmonic Model", ISCA - ITRW, Aalborg, 2008

"Non Linear Speech Features Combined with Fisher's Linear Discriminant for the Objective Detection of Discontinuities in Concatenative Speech Synthesis", INTERSPEECH, Lisbon, 2005

## Funded Grants

5. "Characterising population dynamics with applications in biological data" (2019-2020), *ESPA - Department of Development* (Principal Investigator)

4. "EPIRROH: Information system for monitoring the leaks in municipal water systems" (2017-2019), *INTERREG V Cyprus-Greece* (Co-investigator)

3. "ENRICH: Enriched communication across the lifespan" (2017-2020), *MSCA-ETN-2020* (Partner)

2. "Algorithmic Development and Testing of Integrative Causal Analysis" (2016), *HPC-ARIS* (Member, Principal contributor)

1. "Mathematical Foundations for Uncertainty Quantification in Materials Design" (2013-2017), *Department of Energy* (Member, Informal contributor)

## Teaching Experience

Instructor: Ordinary Differential Equations for Scientists and Engineering (MATH331), UMass, Amherst, 2015

Assistant in Classes (CSD, UoC):

- Digital Signal Processing, 2004 – 2008
- Introduction to Applied Mathematics, 2005 – 2010
- Digital Speech Processing (Graduate), 2006 – 2010
- Statistical Signal Processing (Graduate), 2009

Instructor: Digital Image Processing Lab, ATEI Heraklion, 2005 – 2006

Supervisor or Co-supervisor: Georgios Tzedakis (MSc, CSD, UoC, 2009-2010), Maria Koutsogiannaki (MSc, CSD, UoC, 2009-2010), Weilong Hu (PhD, Math & Stat, UMass, Amhesrt, 2014-2015), Anastasios Tsourtis (PhD, Applied Math, UoC, 2014-2015), Christos Tselas (MSc, CSD, UoC, 2016-2017), Shyam Krishna Khadka (MSc, CSD, UoC, 2016-2017), Myrto Krana (MSc, CSD, UoC, 2017-2018), Ioulia Karagiannaki (MSc, CSD, UoC, 2018-now), Christina Velonaki (Internship, summer 2018), Dipjyoti Paul (PhD, CSD, UoC, 2018-now) Konstantinos Petousakis (MSc, Biology, UoC, 2018), Max Steiber (BSc, Engineering, ETH, 2018)

## Scholarships & Awards

1st place in CTTSO's Challenge on "Algorithmic Identification of Material Mixtures from Raman Spectra", 2016

1st Honorable Mention (bronze medal) in DARPA's Forecasting Chikungunya Challenge, 2015

- [http://www.math.umass.edu/sites/www.math.umass.edu/files/newsletters/63307finalrev.pdf](http://www.math.umass.edu/sites/www.math.umass.edu/files/newsletters/63307finalrev.pdf)

ICS-FORTH, Ph.D. research assistantship (partially funded from Orange Labs), 2007 – 2010

Ericsson Awards of Excellence in Telecommunications, 2005

CSD-UOC, EPEAEK scholarship, 2004 – 2006

ICS-FORTH, B.Sc. research assistantship, 2003

## Research Impact Metrics (from Google Scholar)

Total citations: **528**

Citations/year: **64** (5yr average)

h-index: **14**

i10-index: **16**