

# **Curriculum Vitae**

## **Alexia Briassouli**

### **Address**

Information Technologies Institute (ITI)  
Centre for Research and Technology, Hellas (CERTH))  
6<sup>th</sup> km Harilaou-Thermis,  
Thermi, 57001, Thessaloniki, Greece  
Telephone: +302311257769  
Email: [abria@iti.gr](mailto:abria@iti.gr)  
[http://mkg.iti.gr/mklab\\_people/~abria/](http://mkg.iti.gr/mklab_people/~abria/)

### **Education**

Ph.D. in Electrical and Computer Engineering (2001- 2005)  
University of Illinois, Urbana-Champaign  
  
MSE in Systems of Signal and Image Processing (1999- 2001)  
Interdepartmental Postgraduate Program: "Signal and Image Processing Systems: Theory, Implementations, Applications (SIPS)", University of Patras.  
  
Diploma in Electrical and Computer Engineering (1994- 1999)  
National Technical University of Athens, Department of Electrical and Computer Engineering

### **Professional Experience:**

2006- current  
Postdoctoral Research Fellow, Information Technologies Institute ([www.iti.gr](http://www.iti.gr)), Centre for Research and Technology, Hellas (CERTH, [www.certh.gr](http://www.certh.gr))  
  
2006- 2010  
Visiting Adjunct Professor, Department of Computer and Communication Engineering, University of Thessaly, Greece  
  
2005- 2006  
Postdoctoral Research Associate, University of Illinois, Urbana-Champaign, Department of Electrical and Computer Engineering  
  
2001- 2005  
Research Assistant, University of Illinois, Urbana-Champaign, Department of Electrical and Computer Engineering  
  
2000- 2001  
Research Associate, Informatics and Telematics Institute ([www.iti.gr](http://www.iti.gr)), Centre for Research and Technology, Hellas (CERTH, [www.certh.gr](http://www.certh.gr))  
  
1999-2000  
Teaching Assistant, University of Patras

## **Teaching Experience:**

University of Thessaly, Greece  
Department of Computer and Communication Engineering

Graduate Level:

- Image and Video Processing
- Speech and Sound Processing
- Advanced Topics in Digital Signal Processing

Undergraduate Level:

- Introduction to Signals and Systems
- Digital Image Processing
- Digital Signal Processing

## **Student Advising:**

### **PhD students co-advisor:**

1. Konstantinos Avgerinakis (2014), "Video processing for tracking, change detection and activity classification", Informatics and Telematics Institute, CERTH, Faculty of Engineering and Physical Sciences University of Surrey.
2. Vagia Kaltsa (expected 2016), "Analysis of random motions in videos of crowds, temporal textures", Aristotle University of Thessaloniki.

### **Masters students:**

1. Konstantinos Avgerinakis (2009), "Video Tracking Using Scale-Invariant Feature Transform (SIFT) Algorithm", Department of Computer and Communication Engineering, University of Thessaly, Greece
2. Stergios Poularakis (2010), "Video analysis for event and activity detection and recognition", Department of Computer and Communication Engineering, University of Thessaly, Greece

### **Bachelors students:**

1. Nikolaos Kapetanios, "Adaptive Color Modelling for Background Detection and Tracking" (fall 2007).
2. Dimitris Koutsaftikis, "Hidden Markov Model background removal for event localization", (spring 2008).
3. Kostas Sotiropoulos, "Advanced clustering techniques in images and videos".
4. Despina Koutsagia, "Motion Estimation based on Mean Squared Error minimization of Fourier Phase", spring 2008.
5. Parthena Xanthopoulou, "Transparent Object Motion Segmentation using Fourier Techniques" (spring 2008).
6. Stergios Poularakis, "Statistical Video Processing for the Characterization and Detection of Human Activity" (spring 2008).

## Research Interests

Sequential change detection in video for crowd event detection, human activity recognition (current)  
Investigation of the application of detection and estimation theory, SPRT, CUUSM in real video.

Human Activity Recognition (current)

Application of sequential techniques to video analysis in combination with SoA BoVW methods for human activity recognition. Focus on Activities of Daily Living (ADLs) for assisted living applications. Extension to challenging datasets in-the-wild.

Characterization of temporal texture videos (current)

Analysis and characterization of temporal textures based on Fourier domain properties. Detection of changes in temporal textures. Characterization, segmentation and recognition of temporal textures

Event and activity recognition in video for surveillance (current)

Statistical processing of video for the recognition of events and human activities in surveillance.

Video analysis for semantics extraction (past)

Joint motion and color analysis of video for the extraction of higher level concepts. Statistical video processing and extraction of annotations.

Transform domain video processing (current, past)

Video processing via the Fourier transform, Time-frequency distributions and wavelet transform for motion estimation and segmentation.

Detection theory for watermarking of image and video (past)

Video and image watermarking. Optimal embedding and detection of watermarks in image and video.

## R & D Projects

Alexia Briassouli has extensive experience in writing research proposals for EU and national grants. She has participated in the following R & D projects:

- Researcher (current): "Dem@Care – Dementia Ambient Care: Multi-Sensing Monitoring for Intelligent Remote Management and Decision Support", FP7 (<http://www.demcare.eu/>)
- Researcher (current): "MEDUSA – Multi Sensor Data Fusion Grid for Urban Situational Awareness", EDA
- Researcher (2007-2010): "JUMAS – Judicial Management by Digital Libraries Semantics" (<http://www.jumasproject.eu/>)
- Workpackage Leader, researcher (2006-2007): "aceMedia – Integrating knowledge, semantics and content for user centered intelligent media services" (<http://acemedia.org/aceMedia>)
- Researcher (2000-2001): "ASPIS: An Authentication and Protection Innovative Software System for DVDROM and Internet" (<http://www.iti.gr/db.php/el/projects/ASPIS.html>)

## **Reviewer (partial list)**

1. IEEE Transactions on Pattern Analysis and Machine Intelligence
2. IEEE Transactions on Circuits and Systems for Video Technology
3. IEEE Transactions on Image Processing
4. IEEE Transactions on Multimedia
5. Signal Processing (EURASIP)
6. EURASIP Journal on Information Security
7. International Conference on Image Processing (ICIP)
8. European Conference on Computer Vision (ECCV)
9. IEEE Conference on Computer Vision and Pattern Recognition (CVPR)
10. International Conference on Pattern Recognition (ICPR)

## **Publications**

### **Theses**

#### **Phd thesis**

"Fusion of Frequency and Spatial Domain Information for Motion Analysis"

Department of Electrical and Computer Engineering, University of Illinois at Urbana-Champaign, 2005.

#### **Masters Thesis**

"Hidden Messages in Heavy-Tails: DCT-Domain Watermark Detection Using Alpha-Stable Models"  
Interdepartmental Postgraduate Program "Signal and Image Processing Systems: Theory, Implementations, Applications (SIPS)", University of Patras, 2000.

#### **Bachelors Thesis**

"Improving the 3D Reconstruction of Images from 2D Sequences of Video Frames in the Presence of Additive Noise"

Department of Electrical and Computer Engineering, National Technical University of Athens, 1999.

## **Books**

1. K. Avgerinakis, Alexia Briassouli and I. Kompatsiaris, "Activities of Daily Living Detection And Recognition: Activity detection and recognition of daily living events", in "Comprehensive Health Monitoring and Personalized Feedback Using Multimedia Data", A. Briassouli, J. Benois-Pineau, A. Hauptmann Eds, Springer, 2015.
2. Vasileios Mezaris, Georgios Th. Papadopoulos, Alexia Briassouli, Ioannis Kompatsiaris, Michael G. Strintzis: "Semantic Video Analysis and Understanding", Encyclopedia of Information Science and Technology, Second edition.
3. Dimitrios Simitopoulos, Alexia Briassouli and Michael G. Strintzis: "Robust Watermark Detection from Quantized MPEG Video Data", Multimedia Security Handbook, B. Fuhrt and D. Kirovski Eds., CRC Press.

## Journal Publications

- [J1] K. Avgerinakis, A. Briassouli, I. Kompatsiaris, "Activities of Daily Living Recognition Using Optimal Trajectories from Motion Boundaries", *Journal of Ambient Intelligence and Smart Environments* (to appear).
- [J2] V. Kaltsa, A. Briassouli, I. Kompatsiaris, L. Hadjileontiadis, M. G. Strintzis, "Swarm Intelligence for Detecting Interesting Events in Crowded Environments", *IEEE Trans. on Image Processing* (to appear, IF: 3.111).
- [J3] A. Briassouli, D. Matsiki, I. Kompatsiaris, "Continuous Wavelet Transform for Time Varying Motion Extraction", *IET Image Processing, Special Issue VIE*, Vol. 4 (4), pp. 271 - 282 , August 2010.
- [J4] A. Briassouli, I. Kompatsiaris, "Robust Temporal Activity Templates Using Higher Order Statistics," *IEEE Transactions on Image Processing*, Vol. 18, Issue 12, pp. 2756-2768, Dec. 2009.
- [J5] G. Th. Papadopoulos, A. Briassouli, V. Mezaris, I. Kompatsiaris and M. G. Strintzis, "Statistical Motion Information Extraction and Representation for Semantic Video Analysis," *IEEE Transactions on Circuits and Systems for Video Technology*, vol. 19, no. 10, pp. 1513-1528, October 2009.
- [J6] A. Briassouli, V. Tsiminaki, I. Kompatsiaris, "Human Motion Analysis via Statistical Motion Processing and Sequential Change Detection," *EURASIP Journal on Image and Video Processing*, vol. 2009, Article ID 652050, 16 pages, 2009.
- [J7] A. Briassouli, D. Matsiki, I. Kompatsiaris, "Continuous Wavelet Transform for Time Varying Motion Extraction," *IET Image Processing, Special Issue VIE*.
- [J8] A. Briassouli, V. Mezaris, I. Kompatsiaris, "Combination of Accumulated Motion and Color Segmentation Fusion for Human Activity Analysis," *EURASIP Journal on Image and Video Processing*, vol. 2008, Article ID 735141, 2008.
- [J9] Alexia Briassouli and N. Ahuja: "Integration of Frequency and Space for Multiple Motion Estimation and Shape-Independent Object Segmentation", *IEEE Trans on Circuits, Systems and Video Technology*, Vol. 18, No. 5, May 2008, 657-669.

- [J10] A. Briassouli, V. Mezaris, I. Kompatsiaris, "Color aided motion-segmentation and object tracking for video sequences semantic analysis," *International Journal of Imaging Systems and Technology (IJIST)*, Special Issue on Applied Color Image Processing, Vol. 17, Issue 3, pp 174-189, 2007.
- [J11] A. Briassouli and N. Ahuja, "Extraction and Analysis of Multiple Periodic Motions in Video Sequences," *IEEE Trans. on Pattern Analysis and Machine Intelligence*, Vol. 29, Issue 7, July 2007, pp. 1244-1261.
- [J12] A. Briassouli and M. G. Strintzis, "Locally Optimum Nonlinearities for DCT Watermark Detection'," *IEEE Trans. on Image Processing*, Vol. 13, Issue 12, Dec. 2004, pp. 1604-1617.
- [J13] A. Briassouli and M. G. Strintzis, "Optimal Watermark Detection Under Quantization in the Transform Domain," *IEEE Trans. on Circuits, Systems and Video Technology*, Vol. 14, Issue 12, Dec 2004, pp. 1308-1319.
- [J14] A. Briassouli, P. Tsakalides and A. Stouraitis "Hidden Messages in Heavy-Tails: DCT-Domain Watermark Detection Using Alpha-Stable Models'," *IEEE Transactions of Multimedia*, Vol. 7, Issue 4, Aug. 2005, pp. 700 – 715.
- [J15] D. Simitopoulos, S. A. Tsiftaris, N. V. Boulgouris, A. Briassouli, and M. G. Strintzis, "Fast Watermarking of MPEG-1/2 Streams Using Compressed-domain Perceptual Embedding and a Generalized Correlator Detector," *EURASIP JASP*, 2004:8, pp 1088-1106.

## Conference Publications

- [C1] V. Kaltsa, A. Briassouli, I. Kompatsiaris and M. G. Strintzis, "Swarm - based Motion Features for Anomaly Detection in Crowds", 2014 IEEE International Conference on Image Processing, Paris, France, Oct 27-30, 2014.
- [C2] K. Avgerinakis, A. Briassouli, I. Kompatsiaris. "Activity detection and recognition of daily living events". To be presented at the 1st ACM MM Workshop on Multimedia Indexing and Information Retrieval for Healthcare (MIIRH): held in conjunction with ACM MM 2013, Barcelona, Spain, Oct 2013.
- [C3] K. Avgerinakis, A. Briassouli, I. Kompatsiaris. "Robust Monocular Recognition of Activities of Daily Living for Smart Homes". 9th International Conference on Intelligent Environments (IE2013), Athens, Greece, July 18-19, 2013.
- [C4] K. Avgerinakis, A. Briassouli , I. Kompatsiaris, "Recognition of Activities of Daily Living", 5th International Symposium on Monitoring & Surveillance Research (ISMSR): Healthcare-Safety-Security, Athens, Greece, Nov. 9 2012.
- [C5] V. Kaltsa, A. Briassouli, I. Kompatsiaris and M. G. Strintzis, "Timely, Robust Crowd Event Characterization", 2012 IEEE International Conference on Image Processing, Orlando, Fla, USA, Sept 30 -

Oct 3 2012.

[C6] K. Avgerinakis, A. Briassouli, I. Kompatsiaris, "Smoke Detection Using Temporal HOGHOF Descriptors and Energy Colour Statistics from Video", Firesense Workshop, 8-9 November 2012, Antalya, Turkey.

[C7] K. Avgerinakis, A. Briassouli, I. Kompatsiaris, "Video monitoring for activities of daily living recognition", AAL Forum, Eindhoven, The Netherlands, Sep. 24-27 2012.

[C8] A. Briassouli, I. Kompatsiaris, "Spatiotemporally Localized New Event Detection in Crowds", ARTEMIS ICCV 2011 workshop, Barcelona, November 4-14, 2011, pp 928 - 933.

[C9] A. Briassouli, I. Kompatsiaris, "Change Detection for Temporal Texture in the Fourier Domain", ACCV 2010 - 10th Asian Conference on Computer Vision, Queenstown, New Zealand, November 2010, pp 149-160.

[C10] K. Avgerinakis, A. Briassouli, I. Kompatsiaris, "Real Time Motion Changes for New Event Detection and Recognition", ACCV 2010 Workshop - 10th International Workshop on Visual Surveillance VS 2010, Queenstown, New Zealand, November 2010, pp 1 - 10.

[C11] K. Avgerinakis, A. Briassouli, I. Kompatsiaris, "Real Time Illumination Invariant Motion Change Detection", ACM Multimedia 2010 Workshop - 1st ACM ARTEMIS2010 International Workshop, Firenze, Italy, October 2010, pp.75-80.

[C12] K. Avgerinakis, A. Briassouli, I. Kompatsiaris, "Video processing for judicial applications," ICT4justice, September 2009, Skopje, FYROM.

[C13] S. Poularakis, A. Briassouli, Ioannis Kompatsiaris, "Full Action Instances for Motion Analysis," 10th International Workshop on Image Analysis for Multimedia Interactive Services (WIAMIS 2009), London, UK.

[C14] A. Briassouli, I. Kompatsiaris, "Change Detection for Video," 2nd International Workshop in Sequential Methodologies (IWSM 2009), June 15-17 2009, Troyes, France.

[C15] A. Briassouli, I. Kompatsiaris, "Detection of Multiple Subevents in Space and Time for Video Analysis," WCVIM International Workshop on Computer Vision and its Application to Image Media Processing, January 13 2009, Tokyo, Japan.

[C16] A. Briassouli, I. Kompatsiaris, "Human Activity Localization via Sequential Change Detection," ACM Multimedia-MIR 2008, Oct 27-31 2008, Vancouver, Canada.

[C17] A. Briassouli, I. Kompatsiaris, "Exploitation of knowledge in video recordings," ICT Solutions for Justice, Oct. 2008, Thessaloniki Greece.

- [C18] A. Briassouli, D. Matsiki, I. Kompatsiaris, "Wavelet Domain Processing for Trajectory Extraction," IEEE International Conference on Image Processing (ICIP), Oct. 12-15, 2008, San Diego, USA.
- [C19] A. Briassouli, I. Kompatsiaris, "Statistical Processing of Video for Detection of Events in Space and Time," IEEE International Conference on Multimedia and Expo (ICME), June 23-26, 2008, Hannover, Germany.
- [C20] Alexia Briassouli, Dimitra Matsiki, Ioannis Kompatsiaris, "Continuous Wavelet Transform for Time-Varying Motion Extraction", International Conference on Visual Information Engineering, VIE 2008, July 29 - Aug 1, 2008, Xi'an China.
- [C21] A. Briassouli, S. Dasiopoulou, I. Kompatsiaris, "Ontology-Based Trajectory Analysis for Semantic Event Detection," IEEE International Conference on Semantic Computing (ICSC2007), Sept 2007, pp 735-742.
- [C22] G. Th. Papadopoulos, A. Briassouli, V. Mezaris, I. Kompatsiaris and M. G. Strintzis, "Semantic Video Analysis Based on Estimation and Representation of Higher-Order Motion Statistics", 3rd International Workshop on Semantic Media Adaptation and Personalization (SMAP '08), pp. 21-26, Prague, Czech Republic, December 2008.
- [C23] A. Briassouli, V. Mezaris, I. Kompatsiaris, "Joint Motion and Color Statistical Video Processing for Motion Segmentation," IEEE International Conference on Multimedia and Expo (ICME), July 2007, pp 2014-2017.
- [C24] A. Briassouli, V. Mezaris, I. Kompatsiaris, "Video Segmentation and Semantics Extraction from the Fusion of Motion and Color Information," International Conference on Image Processing (ICIP) Sept. 2007, pp 365-368.
- [C25] A. Briassouli and N. Ahuja, "Spatial and Fourier Error Minimization for Motion Estimation and Segmentation," 18<sup>th</sup> International Conf on Pattern Recognition (ICPR 2006), 2006, Vol. 1, pp 94-97.
- [C26] N. Ahuja and A. Briassouli, "Joint Space-Frequency Processing for Motion Analysis," FG 2006, Proceedings of the 7th International Conference Automatic Face and Gesture Recognition, April 10-12, Southampton, UK.
- [C27] Alexia Briassouli and Narendra Ahuja, "Estimation of Multiple Periodic Motions from Video," ECCV 2006, Proceedings of the 9th European Conference on Computer Vision, May 7 - 13, Gratz, Austria (17% acceptance rate), 2006, pp 147-159.
- [C28] A. Briassouli and N. Ahuja, "Integrated Spatial and Frequency Domain 2D Motion Segmentation and Estimation," ICCV 2005, Proceedings of the 10th International Conference on Computer Vision, Vol. 1, Oct. 15-20, Beijing, China, pp. 244 – 250 (16.2 % acceptance rate).
- [C29] A. Briassouli and N. Ahuja, "Fusion of frequency and spatial domain information for motion



analysis," ICPR 2004, Proceedings of the 17th International Conference on Pattern Recognition, Vol. 2, Aug. 23-26, Cambridge, UK, pp. 175-178.

[C30] P. Moulin and A. Briassouli, "A Stochastic QIM Algorithm for Robust, Undetectable Image Watermarking," ICIP 2004, Singapore (top 15% of papers), pp 1173-1176.

[C31] A. Briassouli and P. Moulin, "Detection-Theoretic Analysis of Warping Attacks in Spread-Spectrum Watermarking," ICASSP 2003, Hong-Kong, pp 53-56.

[C32] P. Moulin, A. Briassouli and H. Malvar, "Detection-Theoretic Analysis of Desynchronization Attacks in Watermarking," DSP 2002, Greece 14th International Conference on, 2002, Vol.1, pp. 77- 84, July 1-3, Santorini.

[C33] P. Moulin and A. Briassouli, "The Gaussian Fingerprinting Game," 2002 CISS, Conference on Information Sciences and Systems, Princeton Univ., March 20 - 22, 2002.

[C34] A. Briassouli, Y. Xirouhakis and A. Delopoulos, "Recursive 3D Reconstruction under Orthography using Kalman Filtering," International Workshop on Synthetic-Natural Hybrid Coding and 3D Imaging (IWSNHC3DI'99), Santorini, Greece.

**Number of citations:** 387

**h-index:** 10

## Workshop Organization

- ACM MM MIIRH 2013: 1<sup>st</sup> ACM MM Workshop on Multimedia Indexing and information Retrieval for Healthcare: held in conjunction with ACM MM 2013 (<http://mklab.it.gr/miirh/>), October 22, 2013, Barcelona, Spain.
- Ambient Telecare 2013 held in conjunction with InMed '13: Innovation in Medicine and Healthcare 2013 (<http://inmed13.innovationkt.org/cms/userfiles/is01.pdf>), July 18-19, 2013, Piraeus, Greece.

## Summer Schools

- Supervision and Support of Practical Sessions at "demAAL: Dem@Care Summer School on Ambient Assisted Living", (<http://mklab.it.gr/demaal2013/>), 16-20 September 2013, Chania, Crete, Greece

## Invited Talks

- September 26-27, 2013: Presentation of Dem@Care project at the REACTION Clustering Event at the Institute of Computer Science (ICS) of the Foundation for Research and Technology – Hellas (FORTH), University of Crete, Heraklion, Crete.
- July 22, 2013: "Fourier Methods for Motion Analysis": Seminar at the Institute of Computer Science (ICS) of the Foundation for Research and Technology – Hellas (FORTH), University of Crete, Heraklion, Crete.

- March 17, 2010: "Statistical processing for spatiotemporal event localization in video," Informatics and Telematics Institute Seminars.
- November 2, 2005: "Integration of Space and Frequency for Motion Estimation and Segmentation": Digital Signal Processing Seminars at the Beckman Institute, University of Illinois at Urbana-Champaign, Illinois, USA.
- August 19, 2002: "Fourier Methods for Motion Analysis": Seminar at the Institute of Computer Science (ICS) of the Foundation for Research and Technology – Hellas (FORTH), University of Crete, Heraklion, Crete.

## **Fellowships**

2001- 2005

Research Assistant, University of Illinois, Urbana-Champaign

1999- 2001

Teaching Assistant, University of Patras

## **Membership in Societies**

Member Institute of Electrical and Electronics Engineers (IEEE)

Member ACM

Member of the Technical Chamber of Greece

## **Programming languages, operating systems**

- Matlab, C/C++, Windows, MAC OSX, Linux

## **Foreign languages**

- Greek (native)
- English (native)
- French (very good)

## **References**

- Ioannis Kompatsiaris  
*Researcher B, Information Technologies Institute, CERTH*
- George V. Moustakides  
*Professor, Dept of Electrical and Computer Engineering, University of Patras*
- Narendra Ahuja  
*Professor, Dept of Electrical and Computer Engineering, University of Illinois at Urbana-Champaign*
- Panagiotis Tsakalides

- Professor Department of Computer Science, University of Crete*
- Michael Strintzis
  - *Professor, Department of Electrical and Computer Engineering, Aristotle University of Thessaloniki*