

DR. DANA ELENA GHITA

PUBLICATIONS

Journal Papers:

- Dana E. Ilea and Paul F. Whelan, "CTex - An Adaptive Unsupervised Segmentation Algorithm Based on Colour-Texture Coherence", *IEEE Transactions on Image Processing* (**Impact factor: 4.82**), vol. 17, no. 10, 2008.
- Dana E. Ilea and Paul F. Whelan (2011), "Image Segmentation based on the Integration of Colour-Texture Descriptors - A Review", *Pattern Recognition* (**Impact factor: 3.4**), vol. 44, issues 10-11, October-November 2011, pp. 2479-2501. In the top 10 (#8) Hottest Pattern Recognition articles from January 2011 to December 2013.
- Dana E. Ilea Ghita, Caoimhe Duffy, Liam Kavanagh, Alice Stanton and Paul F. Whelan (2013), "Fully Automated Segmentation and Tracking of the Intima Media Thickness in Ultrasound Video Sequences of the Common Carotid Artery", *IEEE Transactions on Ultrasonics, Ferroelectrics, and Frequency Control* (**Impact factor: 2.74**), vol. 60, no. 1, pp. 158-177, January 2013. [Also - Highly Cited Articles in *IEEE Transactions on Ultrasonics, Ferroelectrics, and Frequency Control* - January 2014 edition].
- Ovidiu Ghita, Dana E. Ilea and Paul F. Whelan (2013), "Texture Enhanced Histogram Equalisation Using TV-L1 Image Decomposition", *IEEE Transactions on Image Processing* (**Impact factor: 4.82**), vol. 22, no. 8, 2013, pp 3133-3144.
- C.M. Brown, C. Duffy, Dana E. Ilea, Paul F. Whelan, A.V. Stanton (2009), "Carotid artery stiffness is only one tenth that of aortic artery stiffness as assessed by pulse wave velocity", *Journal of Human Hypertension* (**Impact factor: 2.79**), vol. 23, no. 10, pp 698-699, 2009.
- Ovidiu Ghita, Dana E. Ilea and Paul F. Whelan (2009), "Image feature enhancement based on the time-controlled total variation flow formulation", *Pattern Recognition Letters* (**Impact factor: 1.58**), vol. 30, issue 3, 2009, pp. 314-320.
- Ovidiu Ghita, Dana E. Ilea and Paul F. Whelan (2012), "An Adaptive Noise Removal Approach for Restoration of Digital Images Corrupted by Multimodal Noise", *IET Image Processing* (**Impact factor: 1.04**), vol. 6, issue 8, pp 1148-1160, November 2012.
- Ovidiu Ghita, Dana E. Ilea, Antonio Fernandez and Paul F. Whelan (2012), "Local binary patterns versus signal processing texture analysis: a study from a performance evaluation perspective", *Sensor Review* (**Impact factor: 1.27**), vol. 32 issue 2, pp. 149-162.
- M. Lynch, Dana E. Ilea, K. Robinson, O. Ghita and Paul F. Whelan, "Automatic Seed Initialization for the Expectation-maximization Algorithm and its Application in 3D Medical Imaging", *Journal of Medical Engineering and Technology* (**Impact factor: 0.95**), vol. 31, no. 5, pp. 332 – 340, September/October 2007.

Conference Papers.

- Dana E. Ilea, Paul F. Whelan, Catherine Brown, and Alice Stanton (2009), "An Automatic 2D CAD Algorithm for the Segmentation of the IMT in Ultrasound Carotid Artery Images", 31st Annual *International Conference of the IEEE Engineering in Medicine and Biology Society (EMBS'09)*, September 2-6, 2009 Minnesota, USA.
- Dana E. Ilea and Paul F. Whelan (2009), "Colour Saliency-Based Parameter Optimisation for Adaptive Colour Segmentation", *IEEE International Conference on Image Processing (ICIP 2009)*, Cairo, Egypt November 7-11.
- Dana E. Ilea and Paul F. Whelan, "Colour Image Segmentation Using a Spatial K-Means Clustering Algorithm", Proceedings of the *IEEE Irish Machine Vision and Image Processing Conference (IMVIP 2006)*, pp. 146-153, Dublin City University, Ireland, 30 August – 1 September, 2006.
- Dana E. Ilea and Paul F. Whelan, "Adaptive Pre-Filtering Techniques for Colour Image Analysis", Proceedings of the *IEEE International Machine Vision and Image Processing Conference (IMVIP 2007)*, pp. 150-157, National University of Ireland, Maynooth, IEEE Computer Society Press, September 5 -7, 2007.
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- Dana E. Ilea and Paul F. Whelan, "Automatic Segmentation of Skin Cancer Images Using Adaptive Colour Clustering", Proceedings of the *China-Ireland International Conference on Information and Communications Technologies (CICT 2006)*, pp. 348-351, Hangzhou, China, October 18 -19, 2006.
- Dana E. Ilea, O. Ghita and Paul. F. Whelan, "Evaluation of Local Orientation for Texture Classification", Proceedings of the 3rd *International Conference on Computer Vision Theory and Applications (VISAPP 2008)*, pp. 357-364, Funchal, Madeira – Portugal, January 22-25, 2008.
- Dana E. Ilea, Paul F. Whelan and O. Ghita, "Performance Characterization of Clustering Algorithms for Colour Image Segmentation", Proceedings of the *IEEE International Conference on Optimization of Electrical and Electronic Equipment (OPTIM 2006)*, May 18-19, 2006, Brasov, Romania.
- Dana E. Ilea Ghita, Paul F. Whelan and Ovidiu Ghita (2010), "Unsupervised Image Segmentation Based On The Multi-Resolution Integration Of Adaptive Local Texture Descriptors", 5th *International Conference on Computer Vision Theory and Applications (VISAPP 2010)*, May 17-21, 2010, Angers, France.
- Dana E. Ilea, Paul F. Whelan, Catherine Brown and Alice Stanton (2010), "Automatic detection and measurement of the IMT in longitudinal sections of ultrasound images of the CCA, *The European Congress of Radiology (ECR 2010)*, March 4-8, 2010, Vienna, Austria.

- Dana E. Ilea, O. Ghita, K. Robinson, R. Sadleir, M. Lynch, D. Brennan and Paul F. Whelan (2004), "Identification of Body Fat Tissues in MRI Data", **IEEE OPTIM 2004 – 9th International Conference On Optimization of Electrical and Electronic Equipment**, May 20-21, 2004, Brasov, Romania.
- Dana E. Ilea, O. Ghita, K. Robinson, M. Lynch, and Paul F. Whelan (2005) "A 3D CAD tool for body fat identification", Proceedings of 17th **European Congress of Radiology (ECR 2005)**, March 4-8, 2005, Vienna, Austria.
- Michele Peporte, Dana E. Ilea, Eilish Twomey and Paul F. Whelan (2013), "White Matter Segmentation of Brain MRI during Infancy", **BioPhotonics and Imaging Conference (BioPIC 2013)**, March 25-27, 2013, Castleknock Country Club, Dublin, Ireland.
- Michele Peporte, Dana E. Ilea Ghita and Paul F. Whelan (2011), "A Hybrid Approach to Brain Extraction from Premature Infant MRI", **Scandinavian Conference on Image Analysis (SCIA 2011)**, Ystad Saltsjobad, Sweden, May 23-27, 2011.
- Michele Peporte, Dana E. Ilea, Eilish Twomey and Paul F. Whelan (2011), "A morphological approach for infant brain segmentation in MRI data", Proceedings of the **IEEE Irish Machine Vision and Image Processing Conference (IMVIP 2011)**, September 8-9, 2011, IEEE Computer Society.
- C.M. Brown, C. Duffy, Dana E. Ilea, Paul F. Whelan, A.V. Stanton (2009), "Carotid artery stiffness is only one tenth that of aortic artery stiffness as assessed by pulse wave velocity", **British Hypertension Society / Nurses Hypertension Association Annual Scientific Meetings**, St. Johns College, Cambridge, September 14-16, 2009.
- Ovidiu Ghita, Paul F. Whelan, Dana E. Ilea (2008), "Multi-resolution texture classification based on local image orientation", **The International Conference on Image Analysis and Recognition (ICIAR 2008)**, Póvoa de Varzim, Portugal, July 25-27, 2008, Proc. Lecture Notes in Computer Science (LCNS), vol. 5112, pp 688-696.

Dr. Dana E. Ghita

(BEng, PhD)

CURRICULUM VITAE

BEng (Hons, Transilvania University, Brasov, Romania)

PhD (Dublin City University, Dublin, Ireland)

Post-Doctoral Researcher, Centre for Image Processing and Analysis (CIPA), School of
Electronic Engineering, Dublin City University, Ireland

CARRER SUMMARY

Dr. Dana E. (Ilea) Ghita received the BEng (First Class Honours) degree in Electrical Engineering and Computer Science in 2005 from Transilvania University, Brasov, Romania and the PhD degree in Computer Vision from Dublin City University, Ireland in 2008. After completing her PhD research, she joined the Centre for Image Processing and Analysis (CIPA) at Dublin City University (DCU) as a post-doctoral researcher. Her research interests include image segmentation, and its associated quantitative analysis (colour–texture analysis) with applications in computer/machine vision and medical imaging (specifically computer-aided detection and diagnosis). In addition to these research activities she was also involved in academic oriented activities including teaching, student supervision and day-to-day project management.

E-mail: *danaileaelena@gmail.com*

EDUCATION AND TRAINING

- **Elementary school** (1988-1996) Primary School “Paul Grigore”, Brasov, Romania.
- **High school** (1996 – 2000) National College “Dr. Ioan Mesota”, Brasov, Romania, Mathematics- Physics section with intensive English learning.
- **BEng degree** - First class honours - H1 (October 2000 – July 2005) from Transilvania University, Faculty of Electrical Engineering and Computer Science, Brasov, Romania. Language of studies: English.
 - Average Five-Year Grade: 9.79
 - Graduation Grades:
 - Basic and Specialty Knowledge: Electrical Engineering and Control Systems: 10
 - Final Year Project: 10
- 15.07.2001 – 10.09.2001- Industrial placement - c.a.r.u.s. Information Technology, Brasov, Romania.
- 14.07.2002 – 27.07.2002- I have attended a summer course in Leuven, Belgium entitled: “A Journey through Digital Signal Processing in DSP-Valley”.
- 20.09.2002 – 20.02.2003 – I received a Socrates-Erasmus student grant at Centro Politecnico Superior, University of Zaragoza, Spain.
- 11.07.2003 – 26.09.2003 – Visiting student, Vision Systems Group, Dublin City University, Glasnevin, Dublin 9. Summer research internship that involved the development of algorithms for identification of body fat tissues in 2D MRI data.
- 12.07.2004 – 28.09.2004 - Visiting research student, Vision Systems Group, Dublin City University, Glasnevin, Dublin 9. During this period I developed an algorithm for segmentation of 3D MRI data.
- 01.03.2005 – 01.05.2005 – Engineer, training period, Siemens, PSE, Brasov, Romania.

- **PhD degree** in Computer Vision (October 2005 – September 2008) from Dublin City University, School of Electronic Engineering, Dublin, Ireland.

SUMMARY PROFESSIONAL EXPERIENCE

- **Post-graduate Researcher** (October 2005- September 2008), Centre for Image Processing and Analysis, School of Electronic Engineering, Dublin City University, Ireland.

My PhD thesis is entitled “Unsupervised Segmentation of Natural Images Based on the Adaptive Integration of Colour-Texture Descriptors”. The contents of the thesis can be found at the following web link:

http://doras.dcu.ie/582/1/Dana_Ilea_PhD_Thesis_2008.pdf

Key research elements of my Phd Studies:

- Development of an unsupervised mathematical image segmentation framework that is based on the adaptive inclusion of colour and texture in the process of data partition. The major advantage of this research work consists in the adaptive integration of the colour and texture features in a compound mathematical descriptor with the aim of identifying the homogenous regions in the image. This algorithm has been applied to the automatic segmentation of natural images, identification of the skin cancer and pigmented lesions in dermoscopy images, abnormal pattern detection in medical images.
- **Post-doctoral Researcher** (October 2008 – July 2012), Dublin City University, Centre for Image Processing and Analysis (CIPA), School of Electronic Engineering, Dublin, Ireland.
 - I was employed as a researcher within the **National Biophotonics and Imaging Platform Ireland (NBIPI)** for Computer Aided Detection for Ultrasound Vascular Biology (This project was carried out in close co-operation with clinical partners from RCSI, Beaumont Hospital, Dublin). My project objectives were focused on:
 - Detection of functional abnormalities in carotid arteries using advanced image processing tools.
 - Development of robust mathematical models that can be applied to detect vascular diseases in ultrasound carotid images.
 - I continued my research work in the area of colour texture segmentation which concluded with a comprehensive review paper [Ilea, D.E.; Whelan, P.F. (2011) "Image segmentation based on the integration of colour-texture descriptors-A review"] that received 182 citations and remained in the **top 10 (#8) Hottest Pattern Recognition** articles from 2011 to December 2013.

KEY ACADEMIC PERFORMANCE INDICATORS		
Total Refereed Papers		
Journals		9
Conference papers		17
h-index	(Google Scholar, July 2018)	9
Citations	(Google Scholar, July 2018)	525

- **Teaching Experience**

Undergraduate Modules (BEng):

- Software Engineering, School of Electronic Engineering, DCU
- Programming Fundamentals, School of Electronic Engineering, DCU
- Image Processing and Analysis, DCU
- Digital Electronics, School of Electronic Engineering, DCU
- Analog Electronics School of Electronic Engineering, DCU

- **Managerial Skills**

- **Project Supervision:**

- PhD student supervision for the project entitled: “White Matter Volume assessment in premature infants on MRI at term - Computer Aided Volume Analysis”
 - Mentored under-graduate students during their summer internship.

- **Project Management:**

- Established the key project milestones
 - Ensured that the project deadlines are met
 - Maintained and developed links with clinical collaborators
 - Generated research reports for funding agencies: NBIPI, SFI, Enterprise Ireland.

- **Presentation of research outcomes at national and international conferences.**

- **Technical Skills:**

- **Programming Languages:** C, C++
 - **Operating Systems:** Windows

- **Foreign Languages:**

- **English:** Fluent
 - **Spanish:** Fluent
 - **German and French:** basic knowledge.

- **Reviewer (Journals and conferences, selected):**

- IEEE Transactions on Medical Imaging
 - IEEE Transactions on Image Processing
 - Pattern Recognition
 - Pattern Recognition Letters

- IEEE International Conference on Optimization of Electrical and Electronic Equipment (*OPTIM*)
- IEEE International Conference on Image Processing
- IEEE International Irish Machine Vision and Image Processing (*IMVIP*) Conference
- **Session Chair:**
 - **CIICT 2006** - China-Ireland International Conference on Information and Communications Technologies, Hangzhou, China, October 18 -19, 2006.
 - **VISAPP 2010**, 5th International Conference on Computer Vision Theory and Applications (VISAPP 2010), May 17-21, 2010, Angers, France.

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Image Processing (Impact factor: 1.04), vol. 6, issue 8, pp 1148-1160, November 2012.

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