

CURRICULUM VITAE

PERSONAL DETAILS

Name: Miguel Tavares Coimbra
Date of Birth: 15/05/1975
Nationality: Portuguese
Address: Rua Clube dos Caçadores, 905, 1º DTTZ
4430-057 Vila Nova de Gaia
Portugal
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EDUCATION

2004-2006 Post-Doc studies at IEETA, University of Aveiro, Portugal. Work consisted in using computer vision methods for the creation of computer tools for clinical analysis of a variety of video exams. Examples include automatic annotation of endoscopic capsule exams, single particle tracking for low SNR confocal microscopy exams, and numerical quantification of patient 3D motion during epileptic seizures.

1999-2004 PhD in Electronic Engineering, Queen Mary, University of London, “Compressed Domain Processing with Applications to Surveillance”. Research consisted in the study of compressed domain information of encoded digital video. This resulted in the development of fast tools that approximate traditional image and video processing methods. The test scenario for these tools was a real underground train CCTV surveillance system.

1993-1998 BEng in Electrical and Computer Engineering with specialization in Telecommunications, at Faculdade de Engenharia da Universidade do Porto, Portugal. Final average: 16. Distinction for graduating in the top 5% of students.

PROFESSIONAL AND ACADEMIC EXPERIENCE

2006-... Assistant Professor of the Computer Science Dep., Faculty of Sciences of the University of Porto, Portugal.

1998-1999 Researcher at INESC-Porto. Worked in the VIDION project in collaboration with RTP, the Portuguese public television provider. Work consisted in the development of the ‘Search workstation’ for RTP’s multimedia digital archive. It included search, real-time navigation and on-line visualization of results.

TEACHING EXPERIENCE

2006-... Graduate and Undergraduate Courses at Universidade do Porto

- 2009/10
 - Human-Computer Interaction
 - Computer Vision (MSc. Level)
- 2008/09
 - Human-Computer Interaction
 - Computer Vision (MSc. Level)
 - Seminar (MSc. Level)
 - Telemedicine and e-Health (MSc. Level)
 - Signal and Image Processing (MSc. Level)
 - Computer Vision (PhD. Level)
- 2007/08
 - Human-Computer Interaction
 - Computer Vision (MSc. Level)

- Computer Vision (PhD. Level)
- Signal and Image Processing (MSc. Level)
- 2006/07
 - Introduction to Informatics (43 undergraduates)
 - Data Structures and Algorithms (183 undergraduates)
 - Graphical Interfaces (138 undergraduates)
 - Signal and Image Processing (7 graduates)
 - Monograph (individual)
- 2002-2003 Lab Monitor for 'Image Processing' at Queen Mary, University of London, under the supervision of Dr. Ebroul Izquierdo.
- 2002-2003 Lab Monitor for 'Multimedia' at Queen Mary, University of London, under the supervision of Dr. Ebroul Izquierdo.
- 1999-2000 Lab Monitor for 'C++ Programming' at King's College London, under the supervision of Dr. Sergio Velastin.

STUDENT SUPERVISION

PhD	Fahran Riaz <i>"Computer Assisted Analysis of Narrow-Band Imaging Endoscopy Exams", DCC, FCUP</i> Paulo Alves <i>"Event Detection for Capsule Endoscopy Video Exams", ProDEI, FEUP</i> Can Ye <i>"Applied Computer Vision for Critical Infrastructures", CMU-Portugal, FCUP</i> Fábio Hedayioglu, <i>"DigiScope - DIGItally enhanced stethoSCOPE for clinical usage", MIM, UP</i>
MSc	Francisco Oliveira, <i>"Real-Time Computer Vision Tools for Capsule Endoscopy Exam Analysis", MCC, FCUP</i> Bruno Lopes, <i>"Software Platform for Assisted Analysis of Cellular Images", MCC, FCUP</i> Celso Ferreira <i>"CellNote: Image processing modules for cellular images", MCC, FCUP</i> Marcos Marafona <i>"Photographic Records of Wounds", MIM, FCUP/FMUP (Co-Supervision)</i>
Researchers	Pedro Gomes <i>Researcher, CMU Portugal Vital Responder project</i> Pedro Nogueira <i>MSc Student, CMU Portugal Vital Responder project</i> Joel Gouveia <i>BSc Student, CMU Portugal Vital Responder project</i> Nuno Marques <i>BSc Student, CMU Portugal Vital Responder project</i>

ALUMNI

MSc	Fábio Hedayioglu, <i>"DigiScope - DIGItally enhanced stethoSCOPE for clinical usage", MIM, UP</i> João Patriarca <i>"Criptografia Adaptiva para Codificação Avançada", MCC, FCUP (Co-Supervision. Supervisor: João Barros, FEUP), 2009</i> André Sousa, <i>"Analysis of colour and texture features of vital-stained magnification-endoscopy images for computer-assisted diagnosis of precancerous and cancer lesions", MIEIC, FEUP, 2008</i>
Scientific	Nelson Gomes,

- Projects
- "Plataformas de processamento de imagem digital: ao encontro de um propósito mais abrangente", DCC, FCUP, 2007*
- Bruno Lopes,
"Determining Leishmania Infection Levels by Automatic Analysis of Fluorescence Microscopy Images", IBMC, 2008
- Carla Teixeira
 "Visita Guiada ao Interior de um Computador", 2008
- Luciana Santos
"Introdução à imagem digital", 2008
- Marta Falcão,
"Levantamento de tecnologias Web actuais passíveis de apoiar o estudo de um aluno do ensino secundário", 2008
- Nádea Serra,
"Ferramenta de ensino para alunos com necessidades educativas especiais", 2008
- Patrícia Silva, Isabel Neves, Teresa Soares,
"Tenho Dislexia", 2009

PUBLICATIONS - JOURNAL PAPERS

1. M. Coimbra, M. Mackiewicz, M. Fisher, C. Jamieson, J. Soares, J.P. Silva Cunha, "Computer Vision Tools for Capsule Endoscopy Exam Analysis", invited paper in Eurasip NewsLetter, vol. 18/1, March 2007, pp. 1-19.
2. J.P. Silva Cunha, M. Coimbra, P. Campos, J. Soares, "Automated Topographic Segmentation and Transit Time Estimation in Endoscopic Capsule Exams", accepted for publication in IEEE Transactions in Medical Imaging.
3. M. Coimbra, and J.P. Silva Cunha, "MPEG-7 visual descriptors – Contributions for automated feature extraction in capsule endoscopy", in IEEE Trans. Circuits and Systems for Video Technology, vol. 16/5, 2006, pp. 628-637.
4. M. Coimbra, and M. Davies, "Approximating optical flow within the MPEG-2 compressed domain" in IEEE Transactions on Circuits and Systems for Video Technology, Volume: 15 , Issue: 1 , Jan. 2005, pp. 103-107.

PUBLICATIONS - CONFERENCE PAPERS

1. J. P. S. Cunha, S. Lima, D. Pacheco, I. Oliveira, J. M. Fernandes, L. Alves, M. Coimbra, and J. Soares, "Automated Endoscopic Capsule Massive Analysis using a Grid Computing Environment," (abstract) in VIII Reunião Ibérica de Cápsula Endoscópica, Porto, Portugal, 2010.
2. J. P. S. Cunha, S. Lima, M. Coimbra, and J. Soares, "ECCA - A Tool for fast annotation of endoscopic capsule exams and its use in a new polyp detection algorithm," (abstract) in VIII Reunião Ibérica de Cápsula Endoscópica, Porto, Portugal, 2010.
3. M. Dinis-Ribeiro, F. Riaz, A. Sousa, P. Pimentel-Nunes, M. Areia, M. Coimbra, "Computer-assisted analysis of gastric magnification chromoendoscopy images: feasibility and potential applications", (abstract) in World Congress of Gastroenterology, London, UK, Nov 2009.
4. A. Sousa, M. Dinis-Ribeiro, M. Areia, M. Coimbra, "Identifying cancer regions in vital-stained magnification endoscopy images using adapted color histograms", in Proc. of IEEE ICIP 2009, Cairo, Egypt, Nov 2009.
5. F. Riaz, M. Dinis-Ribeiro, M. Coimbra, "Quantitative Comparison of Segmentation Methods for In-Body Images", in Proc. of IEEE EMBC 2009, Minneapolis, USA, Sep 2009.
6. S. Lima, J.P. Silva Cunha, M. Coimbra, J. Soares, "ECCA – Endoscopic Capsule Capview cAtaloguer", in Proc. of 11th World Congress on Medical Physics and Biomedical Engineering, Munich, Germany, Sep 2009.
7. F. Riaz, A. Sousa, P. Pimentel-Nunes, M. Areia, M. Coimbra, M. Dinis-Ribeiro, "Análise assistida por computador de imagens de cromendoscopia gástrica: praticabilidade e aplicabilidade", (abstract) in 29th National Meeting in GastroEnterology, Porto, Portugal, 2009.

8. F. Riaz, M. Dinis-Ribeiro, M. Coimbra, "A Review of Current Computer Aided Diagnosis Systems for Polyp Detection in Virtual Colonoscopy", 7th Conference on Telecommunications, Santa Maria da Feira, Portugal, May 2009.
9. F. Riaz, M. Dinis-Ribeiro, M. Coimbra, "Semantic relevance of current image segmentation algorithms", in Proc. of IEEE WIAMIS 2009, London, UK, May 2009.
10. S. Lima, M. Coimbra, J. Soares, J.P. Silva Cunha, "A Tool for Endoscopic Capsule Dataset Preparation for Clinical Video Event Detector Algorithms", in Proc. of HealthInf 2009, Porto, Portugal.
11. F. Hedayioglu, S. Mattos, and M. Coimbra, "A Survey of Audio Processing Algorithms for Digital Stethoscopes", in Proc. of HealthInf 2009, Porto, Portugal.
12. A. Sousa, M. Dinis-Ribeiro, M. Areia, M. Correia, M. Coimbra, "Towards more adequate colour histograms for in-body images", in Proc. of IEEE EMBC 2008, Vancouver, Canada, 2008.
13. M. Coimbra, J. Kustra, P. Campos, J.P. Silva Cunha, "Combining Color with Spatial and Temporal Position of the Endoscopic Capsule for Improved Topographic Classification and Segmentation", in Proc. of SAMT 2006, Athens, Greece, 2006.
14. J.P. Silva Cunha, M. Coimbra, J. Kustra, P. Campos, J. Soares, "Posição e Velocidade Espacial da Cápsula Endoscópica como Ferramenta de Apoio ao Diagnóstico Clínico", (abstract) in 26th National Meeting in GastroEnterology, Porto, Portugal, 2006.
15. J. Soares, F. Baldaque, L. Lopes, M. Coimbra, J.P. Silva Cunha, "Precisão e Eficiência da Anotação Topográfica Manual de Exames de Cápsula Endoscópica", (abstract) in 26th National Meeting in GastroEnterology, Porto, Portugal, 2006.
16. J.P. Silva Cunha, M. Coimbra, C. Vollmar, S. Noachtar, "Quantification of 3d Motion Data for Seizure Semiology Analysis in Epilepsy", (abstract) in 18th National Meeting in Epileptology, Porto, Portugal, 2006.
17. J.P. Silva Cunha, M. Coimbra, P. Campos, J. Soares, "Faster Wireless Capsule Exam Analysis using Automatic Tools", (abstract), in Proc. of International Conference on Capsule Endoscopy 2006, Miami, USA, 2006.
18. M. Coimbra, J.P. Silva Cunha, P. Campos, J. Soares, "Capview.org: A Research Framework for the Development of Automatic Tools for Capsule Endoscopy", (abstract), invited paper in Proc. of 4th Iberian Meeting of Capsule Endoscopy, Coimbra, Portugal, 2006.
19. J.P. Silva Cunha, M. Coimbra, P. Campos, J. Soares, "The First Capview.Org Automatic Tool for Capsule Endoscopy", (abstract), invited paper in Proc. of 4th Iberian Meeting of Capsule Endoscopy, Coimbra, Portugal, 2006.
20. M. Coimbra, P. Campos, and J.P. Silva Cunha, "Topographic Segmentation and Transit Time Estimation for Endoscopic Capsule Exams", in Proc. of IEEE ICASSP 2006, Toulouse, France, 2006.
21. M. Coimbra, P. Campos, and J.P. Silva Cunha, "Extracting clinical information from endoscopic capsule exams using MPEG-7 visual descriptors", in Proc. of IEE EWIMT 2005, London, UK, 2005.
22. M. Coimbra, J.P. Silva Cunha, R. Bausinger, C. Bräuchle, A. Zumbusch, "Objective analysis of illumination noise in fluorescence microscopy", in Proc. of WIAMIS 2005, April, Montreux, Switzerland, 2005.
23. M. Coimbra, and M. Davies, "A Numerical Comparison of Compressed Domain Approximations to Optical Flow", WIAMIS 2004, Lisbon.
24. M. Coimbra, and M. Davies, "Segmentation of moving pedestrians within the compressed domain", in Proc. of IEEE ICASSP 04, Montreal, Canada, 2004.
25. M. Coimbra, and M. Davies, "A New Pedestrian Detection system using MPEG-2 Compressed Domain Information", in Proc. of IASTED International Conference on Visualization, Imaging, and Image Processing (VIIP 2003), Spain, 2003, pp. 598-602.
26. M. Coimbra, M. Davies and S. Velastin, "Pedestrian Detection using MPEG-2 Motion Vectors", in Proc. of WIAMIS 2003, London, 2003, pp. 164-169.

OTHER PUBLICATIONS

1. M. Coimbra, "Poderá um computador 'ver' imagens de cápsula endoscópica?", in EndoNews, Vol: 15, Jul. 2006, pp. 9.

FINANCED PROJECTS

1. MovEpi3D - Motion quantification of 3D body motion during epileptic seizures; Funding Organization: FCT; Role: Investigator; Funding: 128.796€; Duration: 3 years.
2. GERES-Med - Grid-Enabled REpositorieS for medical applications; Funding Organization: FCT; Role: Investigator; Funding: 199.560€; Duration: 3 years.
3. CapView – Automated Tools for Endoscopic Capsule Exam Analysis; Funding Organization: FCT; Role: Investigator; Funding: 87.300€; Duration: 3 years.
4. Vital Responder - Monitoring Stress in First Responder Professionals; Funding Organization: FCT; Role: Co-PI (IT Team Leader); Funding: 519.456€; Duration: 3 years.
5. DigiScope - DIGItally enhanced stethosCOPE for clinical usage; Funding Organization: FCT; Role: PI; Funding: 120.000€; Duration: 3 years

SELECTED PRESENTATIONS

1. 04/12/2009 - "Detecting Cancer in Chromoendoscopy", Universidade da Beira Interior, Covilhã
2. 14/04/2009 - "Computer Assisted Analysis of Emerging Gastroenterology Imaging Technologies", MSc Seminar (MSc in Medical Physics), FCUP, Porto
3. 18/03/2009 - "Image Processing and Analysis", 1st Basic Course on Optical Microscopy Imaging for Biosciences, IBMC, Porto
4. 06/03/2009 - "Looking In: Emerging Imaging Technologies for Gastroenterology", MSc Seminar (MIM), FMUP, Porto
5. 30/01/2009 - "A Little Vision for Biologists", MIT, Boston, USA.
6. 29/01/2009 - "Vital Responder - Monitoring Stress in First Responder Professionals", Carnegie-Mellon University, Pittsburgh, USA.
7. 01/08/2008 - "Medical Imaging Research @ NIP.", UNICENTRO - Universidade Estadual do Centro-Oeste, Guarapuava, Brazil
8. 01/07/2008 - "Medical Imaging Research @ NIP", Real Hospital Português de Beneficência de Pernambuco, Recife, Brazil
9. 21/07/2008 - "Applied Computer Vision Applications", Fraunhofer Institute, Porto
10. 31/01/2008 - "Applied Computer Vision Applications", IBMC, Porto
11. 08/01/2008 - "Analysis tools for endoscopic capsule exams", MSc Seminar (MAOPI), FCUP, Porto

PATENTS

1. M. Coimbra and M. Davies, PCT International Application No. PCT/EP2004/051325, "Optical Flow Estimation Method", Queen Mary & Westfield College, 1st July 2004.

TECHNICAL PROGRAM COMMITTEES

1. CISP 2010, 3rd International Congress on Image and Signal Processing, Yantai, China
2. ICIAR 2009, International Conference on Image Analysis and Recognition, Halifax, Canada
3. ICIAR 2008, International Conference on Image Analysis and Recognition, Póvoa de Varzim, Portugal
4. SecTech 2008, International Conference on Security Technologies, Samui, Thailand

ACADEMIC COMMITTEES

- | | |
|-----|-----------------------------------------------|
| PhD | 1. Janete Borges, DMA, FCUP, Oct 2009 |
| | 2. Sílvia de Francesco, UA, 2009 |
| | 3. Pedro João Soares Rodrigues, UM, Dec 2008 |
| MSc | 1. Paulo Saraiva, DETI, UA, Dec 2009 |
| | 2. João Oliveira, DI, UBI, Set 2009 |
| | 3. João Correia, DMA, FCUP, 2009 |
| | 4. Sérgio Lima, DETI, UA, Jan 2009 |
| | 5. Denis Roda Dos Santos, DETI, UA, July 2008 |

REVIEWER ACTIVITIES

Journals	<i>IEEE Transactions on Circuits and Systems for Video Technology</i> <i>IEEE Transactions on Medical Imaging</i> <i>IEEE Transactions on Biomedical Engineering</i> <i>IEEE Transactions in Image and Video Processing</i> <i>IEE Electronic Letters</i> <i>Eurasip Journal on Applied Signal Processing</i> <i>Image and Vision Computing</i> <i>Journal of Universal Computer Science</i> <i>International Journal of Imaging</i>
Conferences	<i>EMBC 2010</i> <i>EMBC 2009</i> <i>ICIAR 2009</i> <i>PCS 2009</i> <i>ICIAR 2008</i> <i>PCS 2007</i> <i>ICIAR 2007</i> <i>ICIAR 2006</i> <i>BMVC 2004</i> <i>IASTED VIIP 2003</i>

OTHER DATA

2009	Organizing committee of a one day symposium in medical informatics (2° Simpósio de Informática Médica)
2008	Organizing committee of a one day symposium in medical informatics (1° Simpósio de Informática Médica)
2007	Organized a three day workshop on the topic: Design and Development of Video-Games (CDVJ'07 – Criação e Desenvolvimento de vídeo-jogos). Invited speaker: Verónica Orvalho, UPC, Barcelona. Participation: 30 students of 7 different Portuguese Faculties and Universities.
2003	Collaborated in the organization of the IEEE WIAMIS 2003 conference, at Queen Mary, University of London.
1998	Four month studies at Coventry University, UK, integrated in the European ERASMUS student interchange program. Participated in a collaboration project with a local hospital that consisted in the creation of an on-line telemedicine website. This system allowed encrypted access to a medical database, providing a variety of image processing tools for clinical analysis of visual exams.