João Carreira

Curriculum vitae

Summary

Electrical Engineer, specialist in image and video compression. Main interests include software development, embedded systems, signal processing and operating systems.

Work experience

November 2008 – Present

Instituto de Telecomunicações - IT

Research fellow

2008-2009: Research on state of art codecs and technologies for digital television broadcast and performance evaluation using R&S SFE and R&S DVM400 for transmission and reception, respectively.
2009-2012: Subjective quality evaluation of 3D video quality affected by transmission errors. Development of empirical models to characterize the 3D video quality over a DVB-T hierarchical channel. Development of error concealment techniques for 3D video decoders complaint with H.264/MVC.
2013-2016: Develop new techniques to improve the error resilience and error concealment of the High Efficiency Video Coding standard.

February 2017 – Present

ESTG, Polytechnic Institute of Leiria

Invited Assistant Professor

Professor of a laboratory of Microcontroller programming.
Contents: C language, microcontrollers programing.

January 2014 – March 2014

University of Surrey

Laboratory Assistant

Assistant lecturer on practical based course work for software and hardware implementation.
Contents: C language, microcontrollers programing, hardware implementation of a FM receiver.

October 2011 – July 2012

ESTG, Polytechnic Institute of Leiria

Laboratory Assistant

Provided support on the practical course of Microprocessors for Automotive Engineering graduation.
Contents: C language, microcontrollers programming.

Technical skills

- Research and development;
- Image and video compression;
- 3D video transmission and quality evaluation;
- Experience with programable devices (e.g., FPGA, Microcontrollers);
- Experience with Linux operating system and networking concepts.

João Filipe Monteiro Carreira
Rua Cabeço do Alho, 38
Casal do Alho, 2440-132 Batalha
Portugal
☎ +351 919848241
✉ jfmcarreira@gmail.com
https://www.linkedin.com/in/jfmcarreira

Education

January 2015 – Present

IDT, Loughborough University London

PhD Student in Electrical Engineering

Supervisors: Ahmet Kondoz, Erhan Ekmekcioglu - IDT; Pedro Assunção, Sérgio Faria - IT.

April 2013 – December 2014

University of Surrey

PhD Student in Electrical Engineering

Supervisors: Ahmet Kondoz, Erhan Ekmekcioglu; Pedro Assunção, Sérgio Faria.

October 2010 - December 2012

ESTG, Polytechnic Institute of Leiria

Master degree in Electrical and Electronics Engineering - Telecommunications

Thesis title: "Subjective Quality Evaluation and Frame Loss Concealment in 3D Video".
Supervisors: Pedro Assunção, Sérgio Faria and Nuno Rodrigues.
Classification: 18 out of 20.

September 2007 - July 2010

ESTG, Polytechnic Institute of Leiria

Bachelor's in Electrical Engineering – Electronics and Telecommunications

Final project: "DVB-T3D Transmission of 3D Television over a DVB-T Channel".
Supervisors: Pedro Assunção and Sérgio Faria.
Classification: 17 out of 20.

Software skills

Languages	C/C++, bash, Matlab, Python, LaTeX, HTML, VHDL, Ladder
IDE	Eclipse, Visual Studio
Tools	FFmpeg, QT framework, shell tools (sed, awk, grep), git, ssh, subversion, gcc, autotools, CMake, valgrind
OS	Gentoo, Ubuntu, Windows
Engineering	MPLAB, Xilinx, LabVIEW, Simatic Manager, Proteus, WinProp, HFSS, AutoCAD
Codecs	HM (HEVC), HTM (3D-HEVC), JM (H.264) reference software

Developer of a open-source project: PlaYUVer.

Communication skills

Portuguese Native speaker

English Oral: fair – Written: good

IELTS - International English Language Testing System: Average score of 7.0 out of 10.

Organisation skills

- Experience with team work;
- Ability to solve problems;
- Logical and practical;

Additional Information

Interests Programming; Embedded systems; Open-source software; Contributing to a local organisation

Driving license A, B

Publications

Journal publications:

- J. Carreira, P. Assuncao, S. Faria, E. Ekmekcioglu, and A. Kondoz, "A two-stage approach for robust hevc coding and streaming," *IEEE Transactions on Circuits and Systems for Video Technology*, Apr. 2017

Conference publications:

- J. Carreira, L. Pinto, N. Rodrigues, S. Faria, and P. Assuncao, "Subjective assessment of frame loss concealment methods in 3D video," in *Picture Coding Symposium (PCS)*, Dec. 2010, pp. 182–185
- L. Pinto, J. Carreira, S. Faria, N. Rodrigues, and P. Assuncao, "Subjective quality factors in packet 3D video," in *Third International Workshop on Quality of Multimedia Experience (QoMEX)*, Sep. 2011, pp. 149–154
- J. Carreira, P. Assuncao, N. Rodrigues, and S. Faria, "Frame loss concealment for 3D video decoders based on disparity-compensated motion field," in *3DTV-Conference: The True Vision - Capture, Transmission and Display of 3D Video (3DTV-CON)*, Oct. 2012, pp. 1–4
- J. Carreira, N. Rodrigues, S. Faria, and P. Assuncao, "Frame Loss Concealment for H.264/AVC Stereo Video Decoders," in *Conference on Telecommunications (Conftele)*, May 2013, pp. 1–4
- J. Carreira, V. D. Silva, E. Ekmekcioglu, A. Kondoz, P. Assuncao, and S. Faria, "Dynamic motion vector refreshing for enhanced error resilience in HEVC," in *22nd European Signal Processing Conference (EUSIPCO)*, Sep. 2014, pp. 281–285
- J. Carreira, E. Ekmekcioglu, A. Kondoz, P. Assuncao, S. Faria, and V. D. Silva, "Selective motion vector redundancies for improved error resilience in HEVC," in *IEEE International Conference on Image Processing (ICIP)*, Oct. 2014, pp. 2457–2461
- J. Carreira, S. Faria, P. Assuncao, E. Ekmekcioglu, and A. Kondoz, "Error resilience analysis of motion vector prediction in HEVC," in *Conference on Telecommunications (Conftele)*, Oct. 2015, pp. 1–4
- J. Carreira, P. Assuncao, S. Faria, E. Ekmekcioglu, A. Kondoz, and H.Lim, "Reference picture selection using checkerboard pattern for resilient video coding," in *IEEE International Conference on Visual Communications and Image Processing (VCIP)*, Dec. 2015, pp. 1–5

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References

[1] J. Carreira, P. Assuncao, S. Faria, E. Ekmekcioglu, and A. Kondoz, "A two-stage approach for robust hevc coding and streaming," *IEEE Transactions on Circuits and Systems for Video Technology*, Apr. 2017.

[2] J. Carreira, L. Pinto, N. Rodrigues, S. Faria, and P. Assuncao, "Subjective assessment of frame loss concealment methods in 3D video," in *Picture Coding Symposium (PCS)*, Dec. 2010, pp. 182–185.

[3] L. Pinto, J. Carreira, S. Faria, N. Rodrigues, and P. Assuncao, "Subjective quality factors in packet 3D video," in *Third International Workshop on Quality of Multimedia Experience (QoMEX)*, Sep. 2011, pp. 149–154.

[4] J. Carreira, P. Assuncao, N. Rodrigues, and S. Faria, "Frame loss concealment for 3D video decoders based on disparity-compensated motion field," in *3DTV-Conference: The True Vision - Capture, Transmission and Display of 3D Video (3DTV-CON)*, Oct. 2012, pp. 1–4.

[5] J. Carreira, N. Rodrigues, S. Faria, and P. Assuncao, "Frame Loss Concealment for H.264/AVC Stereo Video Decoders," in *Conference on Telecommunications (Conftele)*, May 2013, pp. 1–4.

[6] J. Carreira, V. D. Silva, E. Ekmekcioglu, A. Kondoz, P. Assuncao, and S. Faria, "Dynamic motion vector refreshing for enhanced error resilience in HEVC," in *22nd European Signal Processing Conference (EUSIPCO)*, Sep. 2014, pp. 281–285.

[7] J. Carreira, E. Ekmekcioglu, A. Kondoz, P. Assuncao, S. Faria, and V. D. Silva, "Selective motion vector redundancies for improved error resilience in HEVC," in *IEEE International Conference on Image Processing (ICIP)*, Oct. 2014, pp. 2457–2461.

[8] J. Carreira, S. Faria, P. Assuncao, E. Ekmekcioglu, and A. Kondoz, "Error resilience analysis of motion vector prediction in HEVC," in *Conference on Telecommunications (Conftele)*, Oct. 2015, pp. 1–4.

[9] J. Carreira, P. Assuncao, S. Faria, E. Ekmekcioglu, A. Kondoz, and H.Lim, "Reference picture selection using checkerboard pattern for resilient video coding," in *IEEE International Conference on Visual Communications and Image Processing (VCIP)*, Dec. 2015, pp. 1–5.