

João Amaro

Curriculum Vitae

Rua dos Caniços, 1 - Chão do Bispo
3030-153 Coimbra, PT
☎ (351) 919 061 007
☎ (351) 239 483 448
✉ joao.l.amaro@gmail.com
📄 pt.linkedin.com/in/joaolamaro
Skype name: joao_lamaro



Education

- 2015–present **Phd Student**, *Electrical and Computer Engineering*, University of Coimbra.
Specialized in Telecommunications
- 2008–2013 **Master of Science**, *Electrical and Computer Engineering*, University of Coimbra.
Specialized in Telecommunications
- 2005–2008 **High School**, *Colégio Rainha Santa Isabel*, Coimbra.

PhD Thesis (ongoing)

- Title *Towards real-time high-resolution medical ultrasound imaging using frequency-domain synthetic aperture: a new framework*
- Supervisors Professor Gabriel Falcão & Professor Marco Gomes
- Description In this thesis, a frequency-domain synthetic aperture transmit beamforming for medical ultrasound imaging is under development. This technique is expected to allow pixel resolution that approaches the ultrasound array pitch. The development of this novel imaging paradigm will be followed by an exploration of different computing architectures, namely GPUs, CPUs and FPGAs. The algorithm will be optimized towards each architecture class: programmable CPUs, GPUs and GPU clusters, and reconfigurable, FPGAs.

Masters Thesis

- Title *Synthetic Aperture Beamforming Processing on GPUs using OpenCL*
- Supervisors Professor Gabriel Falcão
- Description This thesis explored the idea that the time-domain version of the synthetic aperture transmit beamforming algorithm can be easily ported across different heterogeneous devices using the same OpenCL code. Single-GPU, multi-GPU and multicore CPU scenarios were explored, producing solutions whose frame-rate throughput exceeded hundreds of frames per second.

Experience

- 2015–present **Phd Student**, *Instituto de Telecomunicações*, Coimbra, PT.
- 2013–2015 **Researcher**, *Universidade de Coimbra*, Coimbra, PT.
Developed *in-vivo* ultrasound techniques for the automatic detection and characterization of nuclear cataract in rats.
- 2009–2010 **Research assistant**, *Instituto de Telecomunicações*, Coimbra, PT.
Developed tools for fast simulation of LDPC decoder bit-error rate performance using multicore CPU solutions, namely OpenMP.

Computer skills

Basic Apache, SSH, VMWare, Git, SVN, SPSS

Intermediate Microsoft Windows, Python, R, OpenMP, Altera OpenCL, Weka, Bash, Omnigraffle, Microsoft Office, Linux, Ubuntu and ArchLinux

Advanced CUDA, OpenCL, C/C++, L^AT_EX, Matlab

Systems Management Management of the GPU and FPGA workstations at MSP-CO, Instituto de Telecomunicações, DEEC, UC. Services managed include Samba, Apache, SSH, Git, SVN and NFS in addition to Matlab, Python, RStudio Server, CUDA, Altera OpenCL

Awards

2015-2018 Fundação para a Ciência e Tecnologia Phd Scholarship Grant SFRH/BD/112088/2015

2012-2013 Best 3% student award (FCTUC)

2009-2010 Best 3% student award (FCTUC)

2008-2009 Best 3% student award (FCTUC)

Communication Skills

Volunteer Teaching Course "Introductory Programming - NXT for basic school students, 2011" Jardim-Escola João de Deus, Coimbra, PT

Scientific Publications

Journal 2 Journal Papers

Conference 4 Conference Papers

Publ. List Full list available [here](#) and Google scholar profile [here](#)

Patents

CATARATA project M. Gomes, F. Perdigão, J. B. Santos, M. J. S. F. S. Santos, M. C. Caixinha, J. Amaro, J. S. F. Ferreira, A. M. L. S. M. Morgado, "SISTEMA DE AQUISICAO ECOGRAFICA PARA OFTALMOLOGIA USANDO UMA ARQUITECTURA SOC ZYNQ-7000", PPP 108836 C, September 2015 (Pending)

Languages

Portuguese **Native**

English **Fluent**

Spanish **Basic**

Interests

- Cooking, Technology, Videogames -

All the transcripts, official records and publications can be provided if solicited.

Full Publications List

Journal Papers

- IEEE UFFC J. Amaro, B. Y. S. Yiu, G. Falcão, M. Gomes, A. C. H. Yu, "Software-based high-level synthesis design of FPGA beamformers for synthetic aperture imaging," *IEEE Transactions on Ultrasonics, Ferroelectrics and Frequency Control*, May, 2015
- ACM Neural Processing Letters J. Maria, J. Amaro, G. Falcão, L. Alexandre, "Stacked Autoencoders using Low-power Accelerated Architectures for Object Recognition in Autonomous Systems," *ACM Neural Processing Letters*, May 2015

Conference Papers

- CONFTELE'15 J. Amaro, G. Falcão, M. Gomes, A. C. H. Yu, B. Y. S. Yiu, "From OpenCL to RTL: Towards Rapid Prototyping of Medical Imaging Systems on FPGAs," *10th Conference on Telecommunications Conftele, Aveiro, Portugal, September, 2015*
- ICU'15 M. Caixinha, E. Velte, M. Santos, F. Perdigão, J. Amaro, M. Gomes, J. Santos, "Automatic Cataract Classification based on Ultrasound Techniques using Machine Learning: A comparative Study," *International Congress on Ultrasonics - ICU, Metz, France, May, 2015*
- IEEE IUS'14 J. Amaro, B. Y. S. Yiu, G. Falcão, M. Gomes, A. C. H. Yu, "Rapid Prototyping of Real-Time FPGA Beamformers for Synthetic Aperture Imaging Based on High Level Synthesis," *IEEE International Ultrasonics Symposium, Chicago, United States, September, 2014*
- IEEE ICASSP'13 J. Amaro, G. Falcão, B. Y. S. Yiu, A. C. H. Yu, "Portable parallel kernels for high-speed beamforming in synthetic aperture ultrasound imaging," *IEEE Int. Conf. on Acoustics, Speech, and Signal Processing - ICASSP, Vancouver, Canada, May 2013*