Manuel Jorge M. Marques

Curriculum Vitae

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"Live this day as if it will be your last." (Og Mandino)

Qualifications

October 2012 to November 2016 — **PhD in Physics**, *School of Physical Sciences, University of Kent*, Canterbury, United Kingdom.
Thesis title: "*Spectrometer-based Optical Coherence Tomography Systems with Extended Functionality*", under the supervision of Prof Adrian Podoleanu, submitted in April 2016, *viva-voce* examination took place in August 2016, graduated November 2016.
Examiners: Prof Christoph Hitzenberger (Medical University of Vienna), Dr Stuart Gibson (University of Kent).

September 2007 to September 2012 — **BSc+MSc in Engineering Physics**, *Faculdade de Ciências da Universidade do Porto*, Porto, Portugal.
Integrated Masters Programme (BSc+MSc).
Level 16.8 in a numerical scale of 20.

Employment

May 2017 to present day — **Research Associate**, *Applied Optics Group, University of Kent*, Canterbury, United Kingdom.
Post-doctoral researcher in the EPSRC-funded project "Robotic Endobronchial Optical Tomography" (*REBOT*), jointly with Hamlyn Robotics Centre (Imperial College London).
The purpose of the REBOT project is to develop a robot-guided endobronchial probe that will allow access to the deepest reaches of the lung. It will be introduced through a working channel of a bronchoscope, making it highly compatible with current procedures. This probe will incorporate several imaging modalities such as OCT and fluorescence imaging.

May 2016 to April 2017 — **Research Associate**, *Applied Optics Group, University of Kent*, Canterbury, United Kingdom.
Post-doctoral researcher in the European Research Council Proof of Concept project "Add-on module for optical coherence tomography with en-face view option" (*AMEFOCT*).
Developing Optical Coherence Tomography systems utilising a new signal processing technology invented at the AOG, Complex Master-Slave Interferometry.

September 2010–2016 — **Project Instructor**, *Physics and Astronomy Department, Faculdade de Ciências da Universidade do Porto*, Porto, Portugal.
Tutoring of high school students in the annual department-organised week-long Physics Summer School (*Escola de Verão de Física*) project on robotics and control systems (programming PID controllers in LEGO Mindstorms systems using LabVIEW). Also managing and supervising the *on-line* registration and feedback process.

April 2015 to October 2015 — **Research Assistant in Photonics/Optical Coherence Tomography**, *Applied Optics Group, University of Kent*, Canterbury, Kent, United Kingdom.
Researcher in the project titled "*Combined time domain and spectral domain coherence gating for imaging and biosensing*", funded by the European Research Council (ERC), grant number 249889.

October 2012 to April 2015 — **Graduate Teaching Assistant**, *School of Physical Sciences, University of Kent*, Canterbury, Kent, United Kingdom.
Performing laboratory demonstrations and marking as part of the Graduate Teaching Assistant Studentship programme, which funded my PhD studies.

October 2009 to October 2012 — **Researcher**, *INESC Porto, Optoelectronics and Electronic Systems Unit*, Porto, Portugal.
Researching in the area of White Light Interferometry and Optical Coherence Tomography (Applied Optics).

February 2012 to August 2012 — **Visiting MSc exchange (Erasmus) Student**, *Applied Optics Group, School of Physical Sciences, University of Kent*, Canterbury, Kent, United Kingdom.
Researching in the area of White Light Interferometry and Optical Coherence Tomography (Applied Optics) as part of my Master's degree in Physical Engineering, supported by the Erasmus Placement programme.

July 2009 to June 2010 — **Translator**, *Calouste Gulbenkian Foundation, Project "Casa das Ciências"* , Porto, Portugal.
Translating educational/formative texts and applets from English/French to Portuguese, so that they could be distributed among high school teachers.

Volunteering work

June 2014 to October 2016 — President of the University of Kent OSA Student Chapter (`http://osakent.osahost.org/`)

November 2013 to June 2014 — Vice-president of the University of Kent OSA Student Chapter (`http://osakent.osahost.org/`)

June 2013 to June 2014 — Treasurer of the Portuguese Association of Researchers and Students in the United Kingdom - *PARSUK* (`http://www.parsuk.pt/`)

July 2012 to November 2013 — Treasurer and web-designer of the University of Porto SPIE Student Chapter (`http://upspiechapter.inescporto.pt/`)

February 2009 to January 2012 — Member of the administration and web-designer of the Portuguese Association of Physics Students - *Physis* (`http://physis.org.pt/`)

Teaching experience

- Teaching assistant at the School of Physical Sciences' PS370 module, *"Skills for Physicists"* for the academic years 2012-13, 2013-14 and 2014-15.
  - lab demonstrator role: answering student queries, addressing issues with the experimental set-ups and protocols.
  - marking lab reports (3 lab reports along the year), providing comprehensive feedback on them.
  - training new PS370 lab demonstrators for the 2015-16 academic year.

Public engagement

November 24th, 2015 — Invited talk (repeat from the one in December 2014) titled "*Optical Coherence Tomography: from a Michelson interferometer to 3-D biomedical imaging (and beyond!)*" for a Physics undergraduate audience (Physics students' society - Physoc - at the University of Kent).

April 23rd, 2015 — Joint invited talk (with Dr Adrian Bradu) titled "*Seeing the Unseen: A talk about novel biomedical imaging techniques*" for the public (IOP / CSES lecture) at Chelmsford, Essex, United Kingdom.

March 14th, 2015 — Volunteer and part-organiser for the "*Light Up Your Life - Day of Discovery*" community outreach event at The Beaney House of Art of Knowledge (Canterbury).

December 9th, 2014 — Invited talk (repeat from the one in February 2014) titled "*Optical Coherence Tomography: from a Michelson interferometer to 3-D biomedical imaging (and beyond!)*" for a Physics undergraduate audience (Physics students' society - Physoc - at the University of Kent).

October 4th, 2014 — Student Guide and Physics Lab Demonstrator (School of Physical Sciences) at the University of Kent Open Days.

July 18th, 2014 — Presented poster showcasing current research at an Institute of Physics Update session (for Physics teachers), which took place in the School of Physical Sciences, University of Kent.

July 12th, 2014 — Student Guide (School of Physical Sciences) at the University of Kent Open Days.

February 18th, 2014 — Invited talk titled "*Optical Coherence Tomography: from a Michelson interferometer to 3-D biomedical imaging (and beyond!)*" for a Physics undergraduate audience (Physics students' society - Physoc - at the University of Kent).

Personal skills and competences

Languages

- **Portuguese:** Native.
- **English:** Highly fluent.
- **French:** Basic understanding and expression (elementary school level).
- **Spanish**: Basic understanding and expression.

Social skills and competences

- Experience in team work from previous work and volunteering positions, and also from sport-related activities, in particular from rowing and athletics. Also holds a UKCC Level 2 Award in Coaching Sessions, awarded by British Rowing in November 2016.

Computer skills

- **Operating Systems:** GNU/Linux (major distributions only, Fedora and Ubuntu); Mac OS (pre- and post-OS X); Microsoft Windows/DOS.
- **Programming:** Python and LabVIEW (used regularly); `C/C++`, `PHP` (basic knowledge).
- **Scientific and Engineering:** Wolfram Mathematica; AutoCAD; OriginLab; `scipy` and `matplotlib`.
- **Typography and Design:** LaTeX2e; Inkscape; The GIMP; Scribus; Adobe Photoshop.
- **Web Design:** `XHTML`, `CSS`. Experience in setting up on-line content management systems (CMS) such as Plone, Drupal, and WordPress.

Scientific society memberships

SPIE (the international society for optics and photonics, formerly the *Society of Photo-Optical Instrumentation Engineers*), since June 2012; **OSA** (Optical Society of America), since November 2012; **Sociedade Portuguesa de Física** (Portuguese Physics Society), since January 2013.

Grants and awards

June 2016 — Outstanding Postgraduate Research Student in Physical Sciences, awarded by the School of Physical Sciences, University of Kent (Canterbury, United Kingdom).

November 2015	Awarded SPIE Travel Scholarship for attending Photonics West 2016 (San Francisco, California, United States of America).
September 2014	Awarded Incubic/Milton Chang Travel Grant for attending Frontiers in Optics 2014/Laser Science (Tucson, Arizona, United States of America).
June 2014	Best poster award - SEPnet Graduate Network Summer School (National Physical Laboratory, Teddington, United Kingdom).
June 2013	Best poster award (Faculty of Sciences) - 3rd Annual University of Kent Post-graduate Research Festival (Canterbury, United Kingdom).
March 2006 to September 2007	Participant on the 2006-2007 edition of the Portuguese Physics Olympiads, where qualified for the Ibero-American Physics Olympiads.

Publications

Sylvain Rivet, **Manuel J. Marques**, Adrian Bradu, and Adrian Podoleanu. Passive optical module for polarization-sensitive optical coherence tomography systems. *Opt. Express*, 25(13):14533–14544, Jun 2017.

Manuel J. Marques, Sylvain Rivet, Adrian Bradu, and Adrian Podoleanu. Polarization-sensitive plug-in optical module for a fourier-domain optical coherence tomography system. In *Proc. of SPIE*, volume 10053, pages 100531B–1, 2017.

Sylvain Rivet, **Manuel J. Marques**, Adrian Bradu, and Adrian Podoleanu. Optical module to extend any Fourier-domain optical coherence tomography system into a polarisation-sensitive system. *Journal of Optics*, 18(6):5607, May 2016.

Manuel J. Marques, Sylvain Rivet, Adrian Bradu, and Adrian Podoleanu. Spectral-domain, polarization-sensitive optical coherence tomography system insensitive to fiber disturbances. In *SPIE BiOS*, pages 96971K–96971K. International Society for Optics and Photonics, 03 2016.

Michael Maria, **Manuel J. Marques**, Christopher Costa, Adrian Bradu, Thomas Feuchter, Lasse Leick, and Adrian GH Podoleanu. Broadband master-slave interferometry using a super-continuum source. In *SPIE BiOS*, pages 96972R–96972R. International Society for Optics and Photonics, 03 2016.

Manuel J. Marques, Adrian Bradu, and Adrian Podoleanu. Two-grating Talbot bands spectral-domain interferometer. *Optics Letters*, 40(17):4014–4017, September 2015.

Manuel J. Marques, Sylvain Rivet, Adrian Bradu, and Adrian Podoleanu. Polarization-sensitive optical coherence tomography system tolerant to fiber disturbances using a line camera. *Optics Letters*, 40(16):3858–3861, August 2015.

Manuel J. Marques, Adrian Bradu, and Adrian G. Podoleanu. Optical Coherence Tomography and Scanning Laser Ophthalmoscopy: approaches to dual-channel retinal tissue imaging. In *Frontiers in Optics 2014*, page FTu2F.3. Optical Society of America, October 2014.

Manuel J. Marques, Adrian Bradu, and Adrian Gh. Podoleanu. Towards simultaneous Talbot bands based optical coherence tomography and scanning laser ophthalmoscopy imaging. *Biomed. Opt. Express*, 5(5):1428–1444, April 2014.

Mohammadreza RN Avanaki, **Manuel J. Marques**, Adrian Bradu, Ali Hojjatoleslami, and Adrian G Podoleanu. A new algorithm for speckle reduction of optical coherence tomography images. In *SPIE BiOS*, pages 893437–893437. International Society for Optics and Photonics, 2014.

Manuel J. Marques, Adrian Bradu, and Adrian Gh. Podoleanu. Tuning a fast linear camera used within a Talbot bands spectrometer-based optical coherence tomography set-up. In Manuel Filipe P. C. Martins Costa, editor, *8th Iberoamerican Optics Meeting and 11th Latin American Meeting on Optics, Lasers, and Applications*, volume 8785, pages 8785E1–8785E1–7, July 2013.

Adrian Bradu, **Manuel J. Marques**, Petr Bouchal, and Adrian Gh. Podoleanu. Combining Gabor and Talbot bands techniques to enhance the sensitivity with depth in Fourier domain optical coherence tomography. In James G. Fujimoto; Joseph A. Izatt; Valery V. Tuchin, editor, *Optical Coherence Tomography and Coherence Domain Optical Methods in Biomedicine XVII*, volume 8571, pages 857136–857136–6, February 2013.

Attended Conferences and Meetings

May 19th, 2017	BMLA Laser and Aesthetics Conference 2017, 35th Annual British Medical Laser Association meeting (Salford, Manchester, United Kingdom). (*presented oral communications,* "Robust low coherence interferometry based proximity sensor for medical robotics" *and* "Versatile hand-held Master-Slave optical coherence tomography system for clinical diagnosis").
Feburary 8th, 2017	MedCity meeting, Assessing Research and Clinical Expertise in Cambridge, London, Oxford and Greater South East (London, United Kingdom).
January 27th – February 2nd, 2017	SPIE Photonics West 2017 (SPIE BiOS conference) (San Francisco, CA, United States of America) (*presented oral communication titled* "Polarization-sensitive plug-in optical module for a Fourier-domain optical coherence tomography system").
November 29th, 2016	NI Days 2016, National Instruments developers meeting (London, United Kingdom).
September 29th–30th, 2016	Workshop on supercontinuum sources and bioimaging applications such as OCT ("UBAPHODESA" project) (Canterbury, Kent, UK). (*presented oral communication*, "Proof of concept for a handheld MS-OCT device".)
June 24th, 2016	EPSRC UK Image Guided Therapies Network+, inaugural event (University College London, UK) (*presented poster*, "Hand-held optical coherence tomography probes for eye imaging and ENT".)
February 13th–18th, 2016	SPIE Photonics West 2016 (SPIE BiOS conference) (San Francisco, CA, United States of America) (*presented oral communication titled* "Spectral-domain, polarization-sensitive optical coherence tomography system insensitive to fiber disturbances".)
December 28th, 2015	GraPE 2015: 4th Annual Meeting of Portuguese Graduates living Abroad (*"**Gra**duados **P**ortugueses no **E**strangeiro"*), "RE:Inventar Portugal" (Guimarães, Portugal).
November 3rd, 2015	NI Days 2015, LabVIEW developers meeting (London, United Kingdom).
September 24th–25th, 2015	Workshop on supercontinuum sources and bioimaging applications such as OCT ("UBAPHODESA" project) (NKT Photonics, Birkerød, Denmark). (*presented oral communication, "*Polarization-sensitive OCT tomography system immune to fibre-based influences*".*)
June 11th–12th, 2015	1st Doctoral Congress in Engineering – Symposium on Engineering Physics (Porto, Portugal). (*part of the scientific committee*, *also presented oral communication,* "Dual-imaging ophthalmic system using optical coherence tomography and scanning laser ophthalmoscopy".)

March 19th–20th, 2015	"IMAGE 2015 - Workshop on Glaucoma and Imaging" (Canterbury, United Kingdom).
December 20th, 2014	GraPE 2014: 3rd Annual Meeting of Portuguese Graduates living Abroad (*"**Gra**duados **P**ortugueses no **E**strangeiro"*), "Portugueses sem Fronteiras : criatividade e inovação". (Lisbon, Portugal)
November 4th, 2014	"Imaging the Optical Frontier" joint Physical Sciences/Engineering/Computing colloquium (Canterbury, United Kingdom). (*part of the organising committee*)
October 19th–23rd, 2014	Frontiers in Optics/Laser Science 2014, Optical Society of America's 98th Annual Meeting (Tucson, AZ, United States of America). (*presented oral communication, "Optical Coherence Tomography and Scanning Laser Ophthalmoscopy: approaches to dual-channel retinal tissue imaging"*)
September 25th, 2014	School of Physical Sciences' Research Symposium (Canterbury, United Kingdom). (*presented oral communication, "Spectral-domain Optical Coherence Tomography with Talbot bands - further developments"*)
June 23rd, 2014	University of Kent's 4th Post-Graduate Research Festival (Canterbury, United Kingdom). (*presented oral communication, "Imaging the eye with a dual-purpose instrument: optical coherence tomography (OCT) and scanning laser ophthalmoscopy (SLO)"*)
June 21st, 2014	LUSO 2014 - 8th Annual Meeting of Portuguese Researchers and Students in the UK (Bath, United Kingdom)
June 9th–12th, 2014	SEPnet Graduate Network Summer School: "Modelling Today - Leading Tomorrow" (National Physical Laboratory, Teddington, United Kingdom). (*presented poster*)
June 5th, 2014	ISAT Institute of Physics (IoP) seminar: Test and Measurement using National Instruments Technology (Kingston upon Thames, United Kingdom). (*presented oral communication, "NI-based solutions used in OCT: challenges")*
December 21st, 2013	GraPE 2013: 2nd Annual Meeting of Portuguese Graduates living Abroad (*"**Gra**duados **P**ortugueses no **E**strangeiro"*), "Migrações Científicas: Ir e Voltar" (Porto, Portugal)
November 20th, 2013	NI Days 2013, LabVIEW developers meeting (London, United Kingdom).
July 22nd–26th, 2013	RIAO/OPTILAS 2013 - VII Iberoamerican Conference on Optics, XI Latinamerican meeting on Optics, Lasers and Applications (Porto, Portugal). (*presented poster*).
June 22nd, 2013	LUSO 2013 - 7th Annual Meeting of Portuguese Researchers and Students in the UK (Cambridge, United Kingdom)
September 6th–8th, 2012	Física 2012, XVIII national meeting of the Portuguese Physical Society (Aveiro, Portugal). (*presented poster* "Fourier-domain Optical Coherence Tomography imaging with mirror term attenuation using Talbot Bands")
May 2nd–4th, 2011	International Symposium on behalf of the 25th anniversary of *Europhysics Letters* - Frontiers of Physics (Munich, Germany).
September 8th–10th, 2010	EWOFS 2010 - 4th European Workshop on Optical Fibre Sensors (Porto, Portugal).