Alex **Soares Duarte**

PhD Physicist · AI Scientist

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About Me

I am PhD physicist and AI researcher with interdisciplinary experience along Europe and south America. I have a PhD degree in physics from my hometown university, south of Brazil, carried with a 2 years exchange program at Heidelberg University in Germany. My first post-doc I did at Oxford University in United Kingdom. Currently I am based in Spain, working at ICFO - institute of photonics sciences developing deep learning computer vision techniques applied to super-resolution microscopy and single molecule localization.

Personal Interests: Music (and play), Cinema, Sculpture, Museums, Running, Hiking, Skating, Beach, Eating Good, Drinking Good (Specialty Coffee and Craft Beers), Rural Tourism.

Skills

Programming Python, C++, LabView, MatLab, HTML, CSS, Flask, Django

Databases MySQL, MongoDB, Amazon Web Service, Gogle Cloud Service

Machine Learning tools PyTorch, Tensorflow, Keras, Pandas, Scikit-Learn, OpenCV

Machine Learning Methods U-Net, Faster R-CNN, Autoencoders, XGBoost, ConvNets, PCA, t-SNE

Experience

ICFO - Institute of Photonic Sciences

Castelldefels (Barcelona), Spain

Postdoctoral Researcher

2016 - Current

- **Molecular Nanophotonics Group** - Prof. Niek van Hulst
- Deep Learning single molecule localization
- Single molecule fluorescence
- Scanning microscopy

Oxford University

Oxford, United Kingdom

Postdoctoral Research Associate

2014 - 2016

- **Kukura Lab** - Prof. Phillip Kukura
- Wide-field microscopy
- Ultrafast spectroscopy
- Biomolecular dynamics

Education

Heidelberg University

Heidelberg, Germany

PhD in Physics

2011 - 2013

- **Motzkus Group** - Prof. Marcus Motzkus
- Vibrational microscopy
- Coherent Raman spectroscopy
- Tissues and carbon nanotubes studies

UFRGS (Federal University of Rio Grande do Sul)

Porto Alegre, Brazil

M.Sc. and PhD in Physics

2009 - 2014

- **PhD Thesis** - Multiplex CARS applied to carbon nanotubes and brain tissues
- Laboratory instrumentation
- Physics and Optics fundamentals

Projects

Deep Learning Localization Super-Resolutiom Microscopy — *ICFO* ***(2020)***

Object detection for single molecule localization image reconstruction

IMC cells segmentation — *Ai.Vali* ***(2019)***

Cells segmentation of imaging mass cytometry images

Endoscopy Image Classification — *Ai.Vali* ***(2019)***

Endoscopy tissues classification with deep learning

Properties Price Prediction — *SharpestMinds* ***(2017)***

Prediction of the sale price of properties in London

Multiplex coherent anti-Stokes Raman scattering microspectroscopy of brain tissue with higher ranking data classification for biomedical imaging — *Journal of Biomedical Optics* ***(2017)***

Christoph Pohling, Thomas Bocklitz, **Alex S. Duarte**, Cinzia Emmanuello, Mariana S. Ishikawa, Benjamin Dietzeck, Tiago Buckup, Ortrud Uckermann, Gabriele Schackert, Matthias Kirsch, Michael Schmitt, Jürgen Popp and Marcus Motzkus

DOI:10.1117/1.jbo.22.6.066005

Wide-Field Detected Fourier Transform CARS Microscopy — *Scientifc Reports* ***(2016)***

Alex Soares Duarte, Christoph Schnedermann, Philipp Kukura

DOI:10.1038/srep37516

Sub-10 fs Time-Resolved Vibronic Optical Microscopy — *J. Physical Chemistry Letters* ***(2016)***

Christoph Schnedermann, Jong Min Lim, Torsten Wende, **Alex S. Duarte**, Limeng Ni, Qifei Gu, Aditya Sadhanala, Akshay Rao, and Philipp Kukura

DOI:10.1021/acs.jpclett.6b02387

Barrierless Photoisomerization of 11-cis Retinal Protonated Schiff Base in Solution — *Journal of American Chemistry Society* ***(2015)***

Giovanni Bassolino, Tina Sovdat, **Alex Soares Duarte**, Jong Min Lim, Christoph Schnedermann, Matz Liebel, Barbara Odell, Timothy D. W. Claridge, Stephen P. Fletcher and Philipp Kukura

DOI:10.1002/10.1021/jacs.5b06492

Chemical imaging of lignocellulosic biomass by CARS microscopy — *Journal of Biophotonics* ***(2014)***

Christoph Pohling, Christian Brackmann, **Alex Duarte**, Tiago Buckup, Annika Enejder and Marcus Motzkus

DOI:10.1002/jbio.201300052

Mapping impurity of single-walled carbon nanotubes in bulk samples with multiplex coherent anti-stokes Raman microscopy — *Nano Letters* ***(2013)***

Alex S. Duarte, Jean Rehbinder, Ricardo R. B. Correia, Tiago Buckup and Marcus Motzkus

DOI:10.1021/nl304371x