Alex **Soares Duarte**

PHD PHYSICIST · DESIGN ENGINEER

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About Me

I am a Phd Physicist and Design Engineer with experience on experimental optical microscopy and deep learning computer vision. My academic career brought me from south of Brazil to Europe, passing by Germany (Heidelberg), UK (Oxford) and Spain (Barcelona). Stepping into industry, I want to use my physics and optics knowledge to develop smart algorithms. Currently, I am Design Engineer at ASML (Velhoven, Netherlands).

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

ASML - Advanced Algorithm Development and Optimization *Eindhoven, Netherlands*

SENIOR DESIGN ENGINEER *2020 - current*

- Algorithm Development

ICFO - Institute of Photonic Sciences *Barcelona, Spain*

POSTDOCTORAL RESEARCHER *2016 - 2020*

- **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