

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, Dogs, 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

Deep Learning Localization Super-Resolution 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

Wide-Field Detected Fourier Transform CARS Microscopy

Scientific 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.jpcllett.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

