MIGUEL FERNANDES, PHD

SCIENTIST WITH THE GOAL TO EMPOWER PEOPLE THROUGH KNOWLEDGE

António Miguel Fernandes

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Germany
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LANGUAGES

English (fluent)

German (fluent)

Portuguese (native)

French (basic)

SKILLS

Machine learning

Genetics

Neuroscience

COMPETENCIES

Communication

Analytical thinking

Problem solving

PROGRAMMING

Python (>5 years)

R

Bash

SQL

I am an experienced scientist fascinated by the analysis of data using **molecular** and **machine learning** methods to extract valuable insights and create knowledge.

- Self-taught programmer, capable of gaining actionable knowledge from complex data.
- Committed team player with strong leadership skills, who thrives on cross-functional teams.
- Natural communicator with strong ability to distill complex information to crucial points and present to broad audiences.

PROFESSIONAL EXPERIENCE

RESEARCHER / DATA SCIENTIST — NOV 2020-PRESENT

Max Planck of Neurobiology, Martinsried, Germany

• I am developing computational approaches (e.g. using dimensionality reduction and clustering) for the analysis and visualization of **transcriptomics datasets** (single-cell RNA sequencing) to find **biomarkers** for particular classes of neuronal cells involved in visual perception.

• To reveal insights from multidimensional brain imaging data and behavioral recordings I am devising automatized and customized **machine learning approaches** (e.g. linear regression, logistic regression, K-means, and hierarchical clustering).

• To target neuronal cells, I am developing new transgenic sensors and actuators using **molecular biology tools** (e.g. CRISPR-Cas9 genome editing, intersectional genetic approaches).

• I am establishing and maintaining **advanced imaging technologies** (2P Optogenetics by Computer-Generated Holography) to selectively manipulate cellular function.

RESEARCH SCIENTIST — SEP 2013-OCT 2020

Max Planck of Neurobiology, Martinsried, Germany

• Employed diverse **machine learning algorithms** to unstructured data.

• **Modelled and analyzed** behavioral and imaging data using supervised and unsupervised learning algorithms (e.g. linear regression, K-means, and hierarchical clustering).

• Performed high-resolution behavioral tracking. Video recording and object tracking using **Computer Vision** (OpenCV).

• Analyzed 3D biological data. Max Planck **high-performance computing** facility (Linux clusters). Bash, CMTK, ANTs, and Image J Macro scripts.

• Imaged neuronal activity combined with Holographic optogenetic stimulation (2P Microscopy).

PHD IN NEUROSCIENCE — APR 2009 - AUG 2013

Hans-Grisebach Award: Outstanding PhD dissertation in biochemistry and molecular biology.

• Performed Confocal **imaging** of *in vivo* and *in vitro* brain samples.

• Developed **molecular genetics and analysis tools** for neural circuit dissection: pharmacogenetic ablation of cells, large genomic and RNA data analysis, DNA/RNA handling, PCR, and molecular cloning.

• Constructed behavioral setups and analyzed **time-series data**.

• Performed **Immunohistochemistry** and **Fluorescent *in situ* Hybridization** techniques.

ACADEMIC EDUCATION

PHD IN NEUROSCIENCE — APR 2009 - AUG 2013

University of Freiburg, Germany

LICENTIATE IN BIOLOGY (EQUIVALENT TO MASTER'S DEGREE) — SEP 2003 - SEP 2008

University of Porto, Portugal

SELECTED COURSES

Machine Learning with Python - Coursera

Databases and SQL for Data Science - Coursera

KEY PUBLICATIONS

Kölsch et al. bioRxiv, 2020 / Mearns et al. Current Biology, 2020 / Fernandes et al. bioRxiv, 2019 (Lead author) / Kunst et al. Neuron, 2019 / Förster et al. Scientific Reports, 2017 / Fernandes et al. PLoS ONE, 2013 (Lead author) / Fernandes et al. Current Biology, 2012 (Lead author).

PRESENTATIONS

Talks

Champalimaud Research Symposium (Lisbon, Portugal), FENS Satellite Symposium (Berlin, Germany),

SPP1926 Annual Meeting (Naurod, Germany) and DFG-Forschergruppe 1279 Meeting (Chorin, Germany).

Conferences (with poster presentation)

SFB 870 Retreat (Munich, Germany), 11th FENS Meeting, Berlin, Germany, MAPS Conference (Strasbourg,

France), 10th International Conference on Zebrafish (Bethesda, USA) and 1st Champalimaud Neuroscience

Symposium (Lisbon, Portugal)

TEACHING

Zebrafish course, TUM PhD program 'Life Science and Technology' (2019), Molecular Neurobiology course

(GSN-LMU University, 2017 and 2018) and Workshop Instructor (TUM University, 2015).

POSTDOC ASSOCIATION — 2014 – PRESENT

Representative

The postdoctoral association represents all postdoctoral fellows of the Max Planck of Neurobiology.

Organized scientific and social events.

INTERNATIONAL EXPERIENCE

Visiting researcher: National Institute of Genetics, Japan, May 2014. NIG Collaboration Grant-NIG-JOINT (2014-A).

Visiting Researcher: Unit on Behavioral Neurogenetics, NICHD, USA, Jan 2011 – Feb 2011.

HOBBIES AND VOLUNTEER EXPERIENCE

Football, martial arts, biking, cooking and reading.

Collaborator: Open Neuroscience. Network promoting open source tools for Neuroscience

(www.open-neuroscience.com)