P95

Eduardo Conde-Sousa

Data Analyst

Porto, Portugal

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Problem solver with versatile skills, an interdisciplinary mindset, and a strong team player. 15+ years of experience in programming (MATLAB, Python, R), 3+ years of experiences as Statistician, 4+ years of experience with bioimage analysis software, and an experienced communicator with 9+ years of teaching experience.

1 Professional Experience

- **P95, Leuven, Belgium**
  - **Data Analyst** [04/2022 - Present]
    - Data analysis
    - Statistical analysis
    - Pipeline automation
    - Mentoring STATS team in R and Git-related subjects

- **INEB – Instituto Nacional de Engenharia Biomédica, Porto, Portugal**
  - **Bioimage Analyst** [03/2018 – 03/2022]
    - Extract numerical data from biological images
    - Pipeline automation
    - Lecturing on image analysis and programming

- **CBMA - Centre of Molecular and Environmental Biology, Braga, Portugal**
  - **Bioinformatics Scientist [01/2016 – 03/2018]**
    - Gather and analyze biological data
    - Statistical analysis
    - Pipeline automation
    - Lecturing on programming and data loading, transformation and visualization

- **CIBIO-INBIO - Research Center in Biodiversity and Genetic Resources, Vairão, Portugal**
  - **Bioinformatics Scientist [12/2014 – 10/2015]**
    - Analyze biological data
    - Statistical analysis
    - Pipeline automation

- **EVMAT 2011 Summer School, Center of Mathematics of University of Porto (CMUP), Portugal**
  - **Teaching Assistant** [08/2011 – 09/2011]

- **Porto Editora, Porto, Portugal**
  - **External Collaborator and Consultant** [12/2007 – 12/2013]

- **Portuguese Ministry of Education, Portugal**
  - **High School Teacher of Mathematics** [08/2004 – 08/2010]

- **Polytechnic Institute of Bragança, Bragança, Portugal**
  - **Teacher of Mathematics** [08/2003 – 08/2004]

2 Education

- **PhD in Applied Mathematics**, Faculty of Sciences of University of Porto (FCUP), Porto, Portugal, 2014
  - Thesis title: Computational Models for Information Storage in Spiking Neurons
  - Supervisor: Dr. Paulo Aguiar
  - Final classification: Approved with Distinction (maximum grade)

- **MSc in Mathematics – Fundamentals and Applications**, Faculty of Sciences of University of Porto (FCUP), Porto, Portugal, 2004
  - Thesis title: Grupóides e Sincronização em Sistemas de Células Acopladas (in Portuguese)
  - Supervisor: Prof. Ana Paula Dias
  - Final classification: Very Good (maximum grade)

- **BSc in Mathematics – Educational Branch**, Faculty of Sciences of University of Porto (FCUP), Porto, Portugal, 2002
  - Final classification: 16 out of 20

3 Professional Development

- Training School TS11 for BioImage Analysts, Feb 1st–5th 2019, Université du Luxembourg, Luxembourg
- Imaris training course for facility staff, July 3rd–4th 2018, Instituto Gulbenkiian de Ciência, Oeiras, Portugal

- Optical Microscopy Imaging for Biosciences, 2018 ed, April 9th-13th 2018, i3S-Instituto de Investigação e Inovação em Saúde, Universidade do Porto, Portugal
- Summer School in Advanced Scientific Computing, June 20th-23rd 2016, Informatics Department, School of Engineering, University of Minho, Braga, Portugal
- Introduction to Next-Generation Sequencing Data and Analysis, June 23rd-26th 2015, CIBIO-inBIO, Vairão, Portugal
- Edinburgh Summer School in Integrative Computational Neuroscience, August 26th–September 2nd 2012, Institute for Adaptive and Neural Computation, School of Informatics, University of Edinburgh, Scotland
- First Portuguese Forum On Computational Biology, July 10th-12th 2008, Instituto Gulbenkian de Ciência, Oeiras, Portugal
- Summer School on Mathematics in Biology and Medicine, September 2004, Instituto Gulbenkian de Ciência, Oeiras, Portugal

4 Systems Experience

- R
- MATLAB
- Linux shell script
- Python

5 Languages

- Portuguese - Native
- English - Proficient (C2)
- Spanish - Proficient (C2

6 Publications

27. Nguyen J. L., Mitratza M., Volkman H. R., de Munter L., Tran T. M. P., Marques C., Mustapha M., Valluri S., Yang J., Antón A., Casas I., **Conde-Sousa E.**, Drikite L., Grüner B., Icardi G., ten Kate G. L., Martin C. Mira-Iglesias A., Orrico-Sánchez A., Otero-Romero S., Rohde G., Jodar L. ,McLaughlin J. M., Bollaerts K. Effectiveness of the BNT162b2 XBB.1.5-adapted vaccine against COVID-19 hospitalization related to the JN.1 variant in Europe: a test-negative case-control study using the id.DRIVE platform, eClinicalMedicine, DOI: 10.1016/j.eclinm.2024.102995

26. Manubens-Gil L., et al., Author Correction: BigNeuron: a resource to benchmark and predict performance of algorithms for automated tracing of neurons in light microscopy datasets, Nature Methods, **21**, 1959, (2024). DOI:10.1038/s41592-023-01848-5

25. Schmied, C., Nelson, M.S., Avilov, S. *et al.* Community-developed checklists for publishing images and image analyses. *Nat Methods* **21**, 170–181 (2024). DOI:10.1038/s41592-023-01987-9

24. Meeraus W., Stuurman A.L., Durukal I., **Conde-Sousa E.**, Lee A., Santa Maria A., Furtado B. E., Ouwens M.,Gray C. M., Valverde D. A., Silva H. G., Taylor S., COVID-19 vaccine booster doses provide increased protection against COVID-19 hospitalization compared with previously vaccinated individuals: Interim findings from the REFORCO-Brazil real-world effectiveness study during Delta and Omicron, Vaccine (2023) DOI:10.1016/j.vaccine.2023.08.085.

23. Manubens-Gil L., et al., BigNeuron: a resource to benchmark and predict performance of algorithms for automated tracing of neurons in light microscopy datasets. Nat Methods (2023). DOI: 10.1038/s41592-023-01848-5

22. Antão-Sousa S., **Conde-Sousa E.**, Gusmão L., Amorim A., Pinto, N., How frequently are Autosomal and X-STRs multistep mutations perceived as single-step? Forensic Science International: Genetics Supplement Series, 2022, 8, pp. 165–166 DOI:10.1016/j.fsigss.2022.10.022

21. Antão-Sousa S., **Conde-Sousa E.**, Gusmão L., Amorim A., Pinto, N., How often have X- and autosomal-STRs mutations equivocal parental origin been assigned? Forensic Science International: Genetics Supplement Series, 2022, 8, pp. 99–101 DOI: 10.1016/j.fsigss.2022.09.035

20. Antão-Sousa S., **Conde-Sousa E.**, Gusmão L., Amorim A., Pinto, N., Estimations of Mutation Rates Depend on Population Allele Frequency Distribution: The Case of Autosomal Microsatellites Genes, 2022, 13(7), 1248 DOI: 10.3390/genes13071248

19. **Conde-Sousa E.**, Vale J., Feng M., Xu K., Wang Y., Della Mea V., La Barbera D., Montahaei E., Baghshah M., Turzynski A., Gildenblat J., Klaiman E., Hong Y., Aresta G., Araújo T., Aguiar P., Eloy C., Polónia A., HEROHE Challenge: Predicting HER2 Status in Breast Cancer from Hematoxylin–Eosin Whole-Slide Imaging. 2022, J. Imaging, 8, 213. DOI: 10.3390/jimaging8080213

18. Pereira-Castro I., Garcia B., Curinha A., Neves-Costa A., **Conde-Sousa E.**, Moita L., Moreira A., MCL1 alternative polyadenylation is essential for cell survival and

mitochondria morphology (2022) Cellular and Molecular Life Sciences 79, 164. ;
DOI: 10.1007/s00018-022-04172-x

17. Neto L., Pinto N., Proença A., Amorim A., **Conde-Sousa E.**, 4SpecID: Reference
DNA Libraries Auditing and Annotation System for Forensic Applications (2021)
Genes, 12, 61.; DOI: 10.3390/genes12010061

16. Freitas A., Aroso M., Barros A., Fernandez M., **Conde-Sousa E**., Leite M.,
Carvalho E., Ribeiro C. C., Ferreira R., Pêgo A. P., Vitorino R., Gomez-Lazaro M.,
Characterization of the striatal extracellular matrix in a mouse model of Parkinson's
disease (2021) Antioxidants, 10(7), 1095; DOI: 10.3390/antiox10071095

15. Nelson G. et al. QUAREP-LiMi: A community-driven initiative to establish
guidelines for quality assessment and reproducibility for instruments and images in
light microscopy, (2021) J. Microscopy; DOI: 10.1111/jmi.13041 arXiv:
arXiv:2101.09153 [q-bio.OT]

14. La Barbera D., Polónia A., Roitero K., **Conde-Sousa E.**, Della Mea V. Detection
of HER2 from Haematoxylin-Eosin Slides Through a Cascade of Deep Learning
Classifiers via Multi-Instance Learning (2020) J. Imaging, 6(9), 82; DOI:
10.3390/jimaging6090082

13. Vieira D., Esteves S., Santiago C., **Conde-Sousa E.**, Fernandes T., Pais, C.,
Soares P., Franco-Duarte R. Population analysis and evolution of Saccharomyces
cerevisiae mitogenomes (2020) Microorganisms, 8(7), 1001; DOI:
10.3390/microorganisms8071001

12. **Conde-Sousa E.**, Pinto N., Amorim A., Reference DNA databases for forensic
species identification: Auditing algorithms (2019) Forensic Science International:
Genetics Supplement Series, 7 (1), pp. 564-566. DOI:
10.1016/j.fsigss.2019.10.091

11. Antão-Sousa S., **Conde-Sousa E.**, Gusmão L., Amorim A., Pinto N.,
Underestimation and misclassification of mutations at X chromosome STRs depend
on population's allelic profile (2019) Forensic Science International: Genetics
Supplement Series, 7 (1), pp. 718-720. doi: 10.1016/j.fsigss.2019.10.150

10. Barros D., **Conde-Sousa E.**, Gonçalves A.M., Han W.M., García A.J., Amaral I.F.,
Pêgo A.P., Engineering hydrogels with affinity-bound laminin as 3D neural stem cell
culture systems (2019) Biomaterials Science, 7 (12), pp. 5338-5349. Doi:
10.1039/c9bm00348g

9. Rito T., Vieira D., Silva M., **Conde-Sousa E.**, Pereira L., Mellars P., Richards M.B.,
Soares P., A dispersal of Homo sapiens from southern to eastern Africa immediately

preceded the out-of-Africa migration (2019) Scientific Reports, 9 (1), 4728, DOI: 10.1038/s41598-019-41176-3

8. Pinto N., Simões R., Amorim A., **Conde-Sousa E.**, Optimizing the information increase through the addition of relatives and genetic markers in identification and kinship cases (2019) Forensic Science International: Genetics, 40, pp. 210-218. DOI: 10.1016/j.fsigen.2019.02.019

7. Barros D., Parreira P., Furtado J., Ferreira-da-Silva F., **Conde-Sousa E**., García A.J., Martins M.C.L., Amaral I.F., Pêgo, A.P., An affinity-based approach to engineer laminin-presenting cell instructive microenvironments, Biomaterials, Vol 192, 2019, doi:10.1016/j.biomaterials.2018.10.039.

6. Machado P., Gusmão L., **Conde-Sousa E.**, Pinto N., The influence of the different mutation models in kinship evaluation, (2017) Forensic Science International: Genetics Supplement Series http://dx.doi.org/10.1016/j.fsigss.2017.09.093

5. Goncalves J., **Conde-Sousa E.**, Egeland T., Amorim A., Pinto N., Key individuals for discerning pedigrees belonging to the same autosomal kinship class, (2017) Forensic Science International: Genetics, 19 March 2017, DOI: 10.1016/j.fsigen.2017.03.018

4. Olivieri A., Sidore C., Achilli A., Angius A., Posth C., Furtwängler A., Brandini S., Rosario Capodiferro M., Gandini F., Zoledziewska M., Pitzalis M., Maschio A., Busonero F., Lai L., Skeates R., Giuseppina Gradoli M., Beckett J., Marongiu M., Mazzarello V., Marongiu P., Rubino S., Rito T., Macaulay V., Semino O., Pala M., Abecasis G.R., Schlessinger D., **Conde-Sousa E.**, Soares P., Richards M.B., Cucca F., Torroni A., Mitogenome diversity in Sardinians: a genetic window onto an island's past, Mol Biol Evol. 2017 Feb 8. doi: 10.1093/molbev/msx082.

3. **Conde-Sousa E.**, Szücs P., Peng H., Aguiar P., N3DFix: an Algorithm for Automatic Removal of Swelling Artifacts in Neuronal Reconstructions, Neuroinformatics, 2016 doi:10.1007/s12021-016-9308-7

2. **Conde-Sousa E.**, Aguiar P., A working memory model for serial order that stores information in the intrinsic excitability properties of neurons, Journal of Computational Neuroscience, Volume 35, Issue 2, October 2013, pp 187-199

1. Pinto N., Magalhães M., **Conde-Sousa E.**, Gomes C., Pereira R., Alves C., Gusmão L., Amorim A., Assessing paternities with inconclusive STR results: the suitability of bi-allelic markers, Forensic Science International: Genetics, Volume 7, Issue 1, January 2013, Pages 16-21.

7 Organization and lecturing at scientific events

Organizer

Main organizer of the 2020 HEROHE grand-challenge (https://ecdp2020.grand-challenge.org/), a parallel event of the 16th European Congress on Digital Pathology, with more than 800 participants.

Invited chair

Co-chair of one session at the European Society of Digital and Integrative Pathology (ESDIP) workshop, 24 November 2020, online event due to Covid-19 pandemic situation

Invited speaker

"The Evolution of Machine Learning", 2nd Ecosystem for Pathology Diagnostics with AI Assistance (EMPAIA) academy, 15 September 2021, online event due to Covid-19 pandemic situation

"The HEROHE challenge", 1st European Society of Digital and Integrative Pathology (ESDIP) Workshop, 24 November 2020, online event due to Covid-19 pandemic situation

"Computational Neuroscience", Human Neurobehavioral Laboratory Workshop: Research Methods in Neuroscience, December 2014, Catholic University of Porto, Portugal

"A working memory model capable of storing pattern sequences without synaptic plasticity", Mathematical Neuroscience Workshop, April 2012, Center of Mathematics of University of Porto (CMUP), Portugal

8 Organization and lecturing at advanced courses & workshops

Main organizer and lecturer

Organizer and Lecturer of "Batch Analysis and Macro Development in ImageJ/Fiji: going beyond the basics" | 3rd Edition, 24 - 26 November 2021 (12 participants), Instituto de Investigação e Inovação em Saúde (i3S), Porto, Portugal

Organizer and Lecturer of "Batch Analysis and Macro Development in ImageJ/Fiji: going beyond the basics – online course" | 2nd Edition, 9 - 15 December 2020 (fully booked), i3S, Porto, Portugal

Organizer and Lecturer of "Batch Analysis and Macro Development in ImageJ/Fiji: going beyond the basics" | 1st Edition, 13 - 15 November 2019 (fully booked), i3S, Porto, Portugal

Organizer of BIAclub (BioImage Analysis Club), periodical presentations, i3S, Porto, Portugal

Organizer and Lecturer of the Workshop (18 hours) "Basic Concepts of Programming in R", 16-31 January 2017, Centre of Molecular and Environmental Biology (CBMA), Department of Biology, University of Minho, Braga, Portugal

Invited lecturer

Lecturer at the module "Clinical Methodology and Statistics" of the "Master in Vaccinology and Drug Development", 9th Edition, 03-05 April 2023, University of Siena, Italy

Lecturer at "High Throughput Screening and Image Analysis for BioSciences" course (half-day session), 25 -28 May 2021, i3S, Porto, Portugal

Lecturer at "Introduction to Digital BioImage Analysis" course (half-day session), 24 - 27 September 2019, i3S, Porto, Portugal

Trainer at "6th NEUBIAS Training School for Early Career Investigators (TS12)" course, 14-17 October 2019, INEC-TEC, Porto, Portugal

Teaching Assistant at "2nd UPTEC's Future of Computing summer school: Coding my first brain – "Hello Brain" in neuromorphic computing" course (2h session), 01-05 July 2019, UPTEC, Porto, Portugal

Lecturer at "High-throughput Screening and Image Analysis for Biosciences" course (2h session), 27-31 May 2019, i3S, Porto, Portugal

Lecturer of the Workshop (30 hours) "Introduction to Scientific Programming with MATLAB", 22-30 April 2016; State University of Rio de Janeiro (UERJ), Rio de Janeiro, Brazil

9 Commissions and Working Groups

Invited consultant of the working group "Segregation X STRs", Spanish and Portuguese Speaking Working Group of the International Society for Forensic Genetics

Invited developer of the "Cambridge Hackathon" of the BigNeuron Project, Human Brain Project, Welcome Trust (UK), Allen Institute for Brain Science (USA), International Neuroinformatics Coordinating Facility, Beijing University of Technology (China).

10 Supervision of academic theses

2019 – 2020   Rita Pacheco Fernandes
MSc in Bioinformatics and Computational Biology
Faculty of Sciences of University of Porto (FCUP), Porto, Portugal
Thesis title: 3D tracing of filament-like structures.
Supervisor: Eduardo Conde-Sousa, PhD, INEB – Porto, Portugal
Co-supervisor: Paulo Aguiar, PhD, INEB – Porto, Portugal
Co-supervisor: Mónica Sousa, PhD, IBMC – Porto, Portugal

2019 – 2020   Luís Manuel Pacheco Neto
MSc in Computer Science
School of Engineering of University of Minho, Braga, Portugal
Thesis title: An efficient and accurate framework for large-scale sequences of DNA barcodes.
Supervisor: Alberto Proença, PhD, ALGORITMI – Braga, Portugal
Co-supervisor: Eduardo Conde-Sousa, PhD, INEB – Porto, Portugal

2017 – 2018   Priscilla Heberle Almeida
MSc in Forensic Genetics
Faculty of Sciences of University of Porto (FCUP), Porto, Portugal
Thesis title: X-chromosomal mapping – a family study for 10 short tandem repeat loci.
Supervisor: Nádia Pinto, PhD, IPATIMUP/i3S
Co-supervisor: Eduardo Conde-Sousa, PhD, INEB – Porto, Portugal

2016 – 2017   Raquel Sofia Miranda Simões

MSc in Bioinformatics

School of Engineering, University of Minho, Braga, Portugal

Thesis title: Distinguishing kinships beyond identity and paternity.

Supervisor: Eduardo Conde-Sousa, PhD, CBMA – Braga, Portugal

Co-supervisor: Nádia Pinto, PhD, IPATIMUP/i3S

2016 – 2017   Pedro Machado

MSc in Forensic Genetics

Faculty of Sciences of University of Porto (FCUP), Porto, Portugal

Thesis title: The influence of mutation models in kinship likelihoods.

Supervisor: Nádia Pinto, PhD, IPATIMUP/i3S

Co-supervisor: Eduardo Conde-Sousa, PhD, CBMA – Braga, Portugal

2016 – 2017   Arti Bandhana

MSc in Mathematical Engineering

Faculty of Sciences of University of Porto (FCUP), Porto, Portugal

Thesis title: Unravelling the genetic component of male infertility

Supervisor: Alexandra Lopes, PhD, IPATIMUP/i3S

Co-supervisor: Eduardo Conde-Sousa, PhD, CBMA – Braga, Portugal