João Pedro Gomes dos Santos

PhD in Computational Neuroscience | Scientific Software Developer

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GitHub: jpgsantos | Portuguese (EU citizen)

Professional Summary

I solve complex problems with algorithms and scientific software. Combining mathematical rigor with practical engineering, I'm particularly good at turning technical complexity into clear insights that help teams make decisions.

Recently, I built and shipped a Kotlin Android application that is now in Play Store testing. This meant owning everything: defining requirements, designing the architecture and data layer, building the UI, and managing releases. I set up solid Git workflows and documentation that can be used by future collaborators. Where it made sense, I used LLM-assisted programming to work faster without sacrificing code quality.

I hold a PhD in Computational Neuroscience that gave me 8+ years of experience working with ODE-based models, parameter estimation, and sensitivity analysis in MATLAB and Python. I built reproducible frameworks and FAIR-compliant tools that can be easily adopted by the broader scientific community. This background means I can switch between research, data analysis, and software engineering as needed, always focused on building solutions that work well today and won't break tomorrow.

Projects

Chore Division Android App - Kotlin, Android Studio   *2025*

- Independently developed full-stack Android application from concept to Google Play deployment, managing entire development lifecycle
- Kotlin and Android SDK to implement modern app architecture, local data persistence, and responsive UI/UX design
- Delivered end-to-end solution including version control (Git), unit testing, debugging, and production APK packaging

Experience

PhD Researcher University of Porto/Karolinska Institutet/KTH/SciLifeLab   *Jan 2016 – Mar 2025*
Porto, PT & Stockholm, SE

  Thesis: A workflow for developing biochemical pathway models using ordinary differential equations

- Built **Subcellular Workflow**: a modular, FAIR compliant MATLAB framework for ODE-based pathway modeling with simulation, analysis and parameterization capabilities. Code: GitHub | Docs: ReadTheDocs
- Implemented methods: parameter estimation, local/global sensitivity, and profile likelihood analysis
- Validated on complex benchmark models in neuroscience/systems biology;
- Published in *Neuroinformatics*

Education

PhD, Computational Neuroscience University of Porto (FCUP/ICBAS/FMUP/GABBA)		2016 – 2025
MSc, Biochemistry University of Porto (FCUP/ICBAS)	*Grade: 16/20*	2013 – 2015
BSc, Biochemistry University of Porto (FCUP/ICBAS)	*Grade: 16/20*	2010 – 2013

Skills

Programming: Python (NumPy, SciPy, Pandas, Matplotlib); Kotlin; MATLAB
Data Science: Statistical and time-series analysis; visualization; parameter estimation; sensitivity analysis
Scientific Computing: ODE modeling; SBML; algorithm development; profile likelihood analysis; reproducibility (FAIR)
Android (Kotlin): Jetpack Compose; ViewModel-based architecture with Hilt; Room & WorkManager; Firebase; notifications; Play Console testing
Tools & Platforms: Git/GitHub; GitHub Actions; VS Code; Codex; Android Studio; IntelliJ; Firebase; SimBiology; Jupyter Notebooks; Conda/Anaconda; Sphinx; LaTeX; Overleaf; Markdown
Productivity & Collaboration: Microsoft Office (Excel, PowerPoint, Word); Jira; Zoom; EndNote; Draw.io; Figma

Languages

Portuguese (Native); English (Fluent, C2)