

Sebastià Agramunt Puig

Summary

Software & AI Engineer with a PhD in Theoretical Physics (12 peer-reviewed publications, 1 patent; see ORCID) and over ten years of industry experience applying advanced mathematical methods to software engineering, machine learning, and AI. Comfortable leading small teams (Tech Lead) or working independently. I am open to opportunities in backend engineering, high-performance computing, CUDA programming, and LLM inference. More at agramunt.me.

Experience

Jan 2021 – **Staff Software Engineer** *Eikon Therapeutics*, Millbrae, California, US.

Present Drug discovery company founded by a Nobel Laureate (Berkeley spinoff) for high-throughput screening of drugs using fluorescence microscopy. Joined at an early stage and scaled with the company through its IPO.

- Implemented protein detection and localization algorithms in pure CUDA, along with Python bindings for the production pipeline and CI/CD for x86 and ARM architectures, achieving a 100x speedup when processing 1.5GB movies.
- Contributed to building the data processing pipeline for single-molecule tracking, including image preprocessing algorithms, PostgreSQL database design, and distributed computing.
- Trained and served image segmentation models (U-Net).
- Contributed CI/CD improvements across the company's entire stack and advocated for best practices in testing and artifact publishing.
- Implemented the physics simulation of Brownian motion for proteins in a simulation software developed in-house.

Jan 2021 – **Privacy Preserving AI Researcher Contractor (Remote)** *Neurocat*, Berlin, Germany.

June 2021 Coauthored a comprehensive report on the state of the art in privacy-preserving machine learning, in collaboration with the Federal Office for Information Security, Germany's primary public institution regulating IT security. The research focused on threats associated with transfer learning, specifically investigating poisoning methods such as backdoor and adversarial attacks.

Nov 2018 – **AI Engineer and Privacy Preserving Machine Learning Lead** *Telefónica Alpha*, Barcelona, Spain.

Aug 2020 Initiated and led the company's Privacy Preserving Machine Learning (PPML) initiative from scratch.

- Acquired a deep understanding of the mathematics behind techniques such as Differential Privacy, Secure Multi-Party Computation (SMPC), and Fully Homomorphic Encryption (FHE).
- Developed a proof-of-concept for Federated Learning with Secure Aggregation (an SMPC technique) and led a small team to evolve it into a functional product for mobile phones.
- Refactored code to transition a neural collaborative filtering recommender system into production.

March 2020 – **Research Scientist - Privacy in Machine Learning** *OpenMined*, Remote.

Aug 2020 OpenMined is a non-profit organization founded by a DeepMind researcher, dedicated to advancing privacy-preserving machine learning research and development.

- Developed an "Introduction to Cryptography" MOOC covering mathematical foundations and Python implementations, reaching over 7,000 students worldwide.
- Researched secure inference on secretly shared machine learning models, with a focus on activation function approximation within algebraic rings.

Jul 2016 – **AI & Routing Algorithms Engineer** *Shotl*, Barcelona, Spain.

Oct 2018 Shotl is a ride-sharing application connecting passengers with similar travel routes. Joined at an early stage, company went public.

- Designed and implemented the company's core routing algorithm from scratch, combining simulated annealing, depth-first search, and Dijkstra's algorithm, following an extensive review of scientific literature.
- Built fast, reliable software to deploy the routing algorithm in production.
- Analyzed urban demand patterns using machine learning techniques.
- Developed a simulator to evaluate the performance of the routing algorithms.

San Francisco Bay Area, California, USA 

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- Jul.2015 **Data Science Consultant** *Accenture Digital*, Sant Cugat (Barcelona), Spain.
- Jul.2016 Utilized ARIMA family models for sales forecasting in various markets for a large cosmetics firm. Created and managed a PostgreSQL database, handling data in various formats such as CSV and Excel. Developed automation scripts in Bash and R, integrated with CRON jobs to streamline data loading processes.
- Jan 2015 – **Fellow, Data Science Europe (DSE)** *Data Science Europe*, Dublin, Ireland.
- March 2015 Acquired fundamental skills in data science, covering SQL, Hive, R, and various machine learning models. Applied this knowledge to analyze New York City taxi data, aiming to predict pickup probabilities based on time and location within Manhattan. The analysis primarily employed Bayesian statistics and nonlinear models such as Random Forest.
- Nov 2014 – **Postdoctoral Researcher** *Catalan Institute for Nanoscience and Nanotechnology (CIN2)*,
Dec 2014 Bellaterra, Barcelona, Catalonia, Spain.
- July 2013 – **Postdoctoral Researcher** *UAB, Physics Department, Group of Smart Nanoengineered
Nov 2013 Materials, Nanomechanics and Nanomagnetism (GNM3)*, Bellaterra, Barcelona, Catalonia, Spain.

Education

- March 2025 – **BUS-217: Accelerate Your Startup Idea** *Stanford University*, Palo Alto, California.
- May 2025 In-person, two-month course at the Stanford campus covering topics to scale an idea into a profitable business: product-market fit, venture capital and financing, business economic models, market landscape, storytelling, and pitching ideas.
- 2010 – 2013 **PhD in Physics** *Universitat Autònoma de Barcelona (UAB)*, Bellaterra, Barcelona, Catalonia, Spain.
Developed novel algorithms and ran numerical simulations for two applications: magnetic levitation with superconductors, and magnetic recording with nanoscale magnets. Graduated *Cum Laude* with highest distinction. Full dissertation: <https://hdl.handle.net/10803/129413> (public TDX repository).
- 2009 – 2010 **M.S. in Science and Technology of Materials** *UAB*.
- 2005 – 2009 **B.S. in Physics** *UAB*.

Tech stack

Languages	C/C++, CUDA, Go	Scripting	Python, Bash, R
ML Frameworks	PyTorch, Keras, scikit-learn	GPU Kernels	CUTLASS, CuTe DSL, Triton (OpenAI), cuBLAS, cuSOLVER
Inference & Serving	vLLM, TensorFlow Serving	Profiling	Nsight Compute, Nsight Systems, roofline analysis
Data	NumPy, Pandas, Polars	Databases	PostgreSQL, MongoDB, Redis
Visualization	Gnuplot, ggplot2, Matplotlib	MLOps	Metaflow, Airflow, ZenML
CI/CD	GitHub Actions, Atlassian Bamboo, Jenkins	Other Tools	Docker, Git, pybind11

Others

- 2024 – **Business Ambassador in Silicon Valley** *ACCIO – Catalan Agency for Business Competitiveness*, San Francisco, CA.
Present Facilitate business relationships between companies in Silicon Valley and Catalunya. Market analysis and strategy.

Scientific Divulcation & Peer Review.

Active collaborator with CienciaProp, giving talks and writing on levitation; contributed to *Dissabtes de la Física*, a UAB initiative explaining physics to high school students. Peer reviewer for *Cognitive Systems Research*.