

AI Engineer and founder with 8+ years of experience building production-grade AI systems across medical imaging, NLP, and signal processing. Specialized in deep learning, LLM pipelines, and probabilistic modeling. Strong background in applied mathematics. Experienced in leading multidisciplinary AI teams and delivering scalable, end-to-end deployed systems.

SKILLS

AI / Machine Learning Engineering	Transformers, LLM Fine-Tuning, RAG, CNNs, U-Net, VAEs, Diffusion Models, Image Segmentation
Math Foundations	Python (Expert), PyTorch, TensorFlow, Docker, CI/CD Pipelines, Data Governance, Data Anonymization
Communication	Optimization, Stochastic Processes, Statistical Inference, Markov Models, Numerical Simulation
	English, French, Spanish (fluent speaker)

EDUCATION

PhD in Applied Mathematics & Statistics	
INSA-Toulouse	December 2012 - August 2016
Developed probabilistic and statistical models for next-generation sequencing data analysis. Applied advanced inference methods to large-scale genomic datasets. Designed and implemented reproducible scientific computing pipelines. Collaborated internationally with multidisciplinary research laboratories.	
MSc in Mathematics	
Havana University	August 2012

TECHNICAL EXPERIENCE

AI Engineer / Pulmonary AI	November 2024 — Present
TORUS ACTIONS	Toulouse, FRANCE
- Led end-to-end development of deep learning pipelines for medical image analysis. - Delivered production-ready detection and segmentation systems for severity assessment. - Designed and fine-tuned convolutional VAEs to improve robustness and generalization. - Developed diffusion-based generative models for synthetic data generation.	
Technical Lead / AI Signal Processing	May 2023 — October 2024
TORUS ACTIONS	Toulouse, FRANCE
- Improved GPS positioning accuracy by integrating neural-network-based filters. - Standardized model training, validation, and evaluation workflows. - Designed CI/CD pipelines enabling automated testing, validation, and quality control.	
CEO and Founder / AI for Medical Imaging	May 2021 — April 2023
TORUS MEDICAL	Toulouse, FRANCE
- Directed a €550K multi-year R&D program, balancing scientific ambition, regulatory constraints and delivery milestones. - Managed and mentored a team of 4 (2 AI engineers, 2 developers) - Delivered 6 functional AI prototypes for automatic radiological measurements. - Established medical and industrial partnerships for prototype integration.	
Research Engineer / NLP for Safety	October 2019 — April 2021
ENAC	Toulouse, FRANCE
- Designed NLP pipelines for aviation safety incident report analysis. - Combined Word2Vec embeddings with LDA-based topic modeling to improve topic interpretability. - Delivered operational NLP tools used by Airbus Safety teams to analyze large-scale textual datasets. - Bridged mathematical theory and deployable NLP systems in collaboration with domain experts.	
Research Engineer / Probabilistic Modeling for Genetics	October 2017 — September 2019
Institut de Mathématiques de Toulouse	Toulouse, FRANCE
- Developed probabilistic models for genetic data analysis using stochastic Markov processes and numerical optimization. - Built Python simulation frameworks to generate synthetic datasets under multiple evolutionary scenarios. - Published two peer-reviewed scientific articles validating the modeling framework.	

- Designed a novel algorithm for genetic recombination map construction addressing an NP-hard optimization problem.
- Applied metaheuristic optimization techniques to large-scale genomic datasets.
- Developed and released an R package adopted by genetics researchers.
- Co-authored a peer-reviewed publication.

SELECTED AI PROJECTS

- *Medical RAG System for Clinical Coding*: Designed domain-adapted LLM pipeline with retrieval and fine-tuning.
- *Voice AI Agent*: Built production conversational AI integrating scheduling and human fallback.
- *GNSS Neural Filtering*: Improved positioning robustness via hybrid ML + classical filtering architecture.

ACTIVITIES

- President and Organizer of the Toulouse Data Science Association 2025 — Present
- Mentor for the year-long MIT PRIMES research program (2024, 2025), focusing on applying NLP and transformer-based architecture for improving Topic Models accuracy. January 2025 January 2026

PUBLICATIONS

- Vidal, A., Gauthier, F., Rodriguez, W., Guiglielmoni, N., Leroux, D., Chevrolier, N., ... & Falque, M. (2022). SeSAM: software for automatic construction of order-robust linkage maps. *BMC bioinformatics*, 23(1), 499.
- Arredondo, A., Mourato, B., Nguyen, K., Boitard, S., Rodríguez, W., Mazet, O., & Chikhi, L. (2021). Inferring number of populations and changes in connectivity under the n-island model. *Heredity*, 126(6), 896-912.
- Tat Dat, T., Frédéric, P., Hang, N. T., Jules, M., Duc Thang, N., Piffault, C., ... & Tien Zung, N. (2020). Epidemic dynamics via wavelet theory and machine learning with applications to Covid-19. *Biology*, 9(12), 477.
- Grusea, S., Rodríguez, W., Pinchon, D., Chikhi, L., Boitard, S., & Mazet, O. (2019). Coalescence times for three genes provide sufficient information to distinguish population structure from population size changes. *Journal of Mathematical Biology*, 78(1), 189-224.
- Rodríguez, W., Mazet, O., Grusea, S., Arredondo, A., Corujo, J. M., Boitard, S., & Chikhi, L. (2018). The IICR and the non-stationary structured coalescent: towards demographic inference with arbitrary changes in population structure. *Heredity*, 121(6), 663-678.
- Chikhi, L., Rodríguez, W., Grusea, S., Santos, P., Boitard, S., & Mazet, O. (2018). The IICR (inverse instantaneous coalescence rate) as a summary of genomic diversity: insights into demographic inference and model choice. *Heredity*, 120(1), 13-24.
- Boitard, S., Rodríguez, W., Jay, F., Mona, S., & Austerlitz, F. (2016). Inferring population size history from large samples of genome-wide molecular data-an approximate Bayesian computation approach. *PLoS genetics*, 12(3), e1005877.
- Mazet, O., Rodríguez, W., & Chikhi, L. (2015). Demographic inference using genetic data from a single individual: Separating population size variation from population structure. *Theoretical population biology*, 104, 46-58.