Chamel Nadir Bouacha

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Profile

Software engineer and AI researcher working on temporal representation learning, temporally faithful retrieval, and healthcare NLP. Experience spans temporal data construction and annotation, benchmark construction, retrieval-augmented generation, agentic AI applications, data pipelines, production APIs, and cloud deployment. Current direction: representations and retrieval systems that respect time, including cases where evidence is semantically relevant yet temporally invalid.

Research Experience

Continuing research collaboration Jun. 2026 – Present
Télécom SudParis — SAMOVAR, Institut Polytechnique de Paris *Paris, France*
- Research collaboration on WaTE after the internship ended.

TempMedBench — temporally faithful healthcare retrieval benchmark 2026 – Present
Active research project
- Developing a benchmark and generation pipeline built from **synthetic** patient records: structured longitudinal timelines generate time-dependent questions, gold evidence relevance judgements, and note chunks against which retrieval strategies are evaluated.
- Targets cases where evidence is semantically relevant yet temporally invalid.

Research Intern — Temporal RAG for Healthcare Sep. 2025 – Jun. 2026
Télécom SudParis — SAMOVAR, Institut Polytechnique de Paris *Paris, France*
- Held primary responsibility for the temporal annotation pipeline and extended it from temporal-expression detection and normalization to event extraction, event-to-time linking, and document-creation-time anchoring.
- The pipeline was applied to approximately **45 million documents**, producing more than **1.2 billion** TIMEX and event annotations; the supervising team executed the final large-scale run.
- Independently proposed the synthetic temporal-document direction and built the generation pipeline.
- Contributed to benchmark selection, evaluation methodology, controls and ablations, research software, and manuscript preparation.

Research Intern — Automatic Code Optimization Jul. 2024 – Oct. 2024
New York University Abu Dhabi (NYUAD) *Abu Dhabi, United Arab Emirates*
- Built a pipeline converting PyTorch models into MLIR intermediate representations using the Linalg and TOSA dialects. Code

Publications and Theses

WaTE: Continuous Distributional Temporal Representations for Text Encoders. *Accepted short paper, 38th IEEE International Conference on Tools with Artificial Intelligence (ICTAI 2026).* Co-author: primary responsibility for temporal annotation and data construction; contributed tokenizer-related ideas, benchmark selection (TempEval-3, TimeBank-Dense, TS-RETRIEVER), evaluation methodology, ablations and controls, and manuscript preparation. Training strategy, tokenizer design, and ablation methodology were joint decisions; collaborators led the final pretraining experiments and produced the reported results.

Building a Temporal Retrieval-Augmented Generation System for Healthcare Applications. *State Engineer thesis*, ESI Algiers and Télécom SudParis, defended 22 June 2026. Full text (DOI)

Exploring Temporal Retrieval-Augmented Generation: Methods, Evaluation, and Open Challenges. *Master's thesis* (state-of-the-art review), ESI Algiers, defended 22 June 2026. Full text (DOI)

Professional Experience

Junior Full-Stack Developer Jul. 2026 – Present
Momentum Worldwide *Toronto, Canada*
- AI-oriented role spanning MCP server engineering, AI enablement, Salesforce engineering, and enterprise technical assessment.
- Built and deployed a **Python/FastMCP server** exposing existing business logic as MCP tools, resources, and prompts for internal operations users.
- Implemented background, batchable CSV reporting with **SOQL and Apex**, deployed from sandbox to production.

Agentic AI Intern Jul. 2025 – Oct. 2025
Maystro Delivery *Algiers, Algeria*

- Architected and deployed a modular multi-agent analytics pipeline on GCP Cloud Run, turning scheduled Google Analytics data into behavioural reports and UI/UX recommendations, with CI/CD through Cloud Build.

Education

École Nationale Supérieure d'Informatique (ESI) Algiers, Algeria
State Engineer Degree and Academic Master in Computer Science *Oct. 2021 – Jun. 2026*
Ingénieur d'état en Informatique and Master Académique en Informatique, both awarded June 2026. Speciality: Systèmes Informatiques et Logiciels (SIL) — Software Systems Engineering. Master's research training in research methodology, research documentation and communication, and scientific project management.

Selected Projects

Samsung Innovation Campus Capstone | *RAG, TF-IDF, predictive modelling* Jan. 2026

- End-to-end pipeline for Algerian Baccalaureate video content: YouTube Data API collection, a TF-IDF-based content filter, engineered engagement features, predictive modelling, and a RAG-based recommendation agent. Won 1st place.

Transformer from Scratch | *PyTorch* Aug. 2025 – Sep. 2025

- Implemented embeddings, multi-head attention, positional encoding, and encoder–decoder blocks following "Attention Is All You Need". Code

IRCHAD: Indoor Navigation for the Visually Impaired | *PyTorch, FastAPI* Feb. 2025 – Jun. 2025

- Team Lead and AI Developer across twelve web, mobile, and backend repositories. Built the floor-plan preprocessing pipeline and designed the evaluation protocol, reaching **89% mAP** for doors, walls, and windows. Code

FLY Page: AI Landing Page Generator | *LangGraph, LangChain, FastAPI* Apr. 2025

- Stateful LangGraph workflow orchestrating four specialized LLM agents with conditional routing and a web-scraping fallback.

HTPL Compiler | *C, Flex, Bison* Dec. 2024 – Jan. 2025

- Lexical analysis, parsing, semantic analysis with type checking, and quadruple generation. Code

Awards

1st Place — DataHack Datathon, 3rd Edition Feb. 2026
CSE, Club Scientifique de l'ESI *Algiers, Algeria*

1st Place — Samsung Innovation Campus Capstone Project Jan. 2026
Samsung Algeria *Algiers, Algeria*

1st Place — HAICK26 Datathon Dec. 2025
School of AI Algiers *Algiers, Algeria*

2nd Place — Agentic AI Hackathon Apr. 2025
Maystro Delivery *Algiers, Algeria*

5th Place — DataHack 2.0 Datathon Feb. 2025
CSE Club *Algiers, Algeria*

2nd Place — GDG Hack 1.0 Feb. 2024
GDG Algiers *Algiers, Algeria*

Teaching and Leadership

Co-Lead — GDG Algiers Jul. 2024 – Jul. 2025
Google Developer Groups *Algiers, Algeria*

- Led the organization of **DevFest Algiers 2024** (200+ participants, two technical tracks) and led 19 managers across the season's events, for a community of 400+ official members.

Microsoft Learn Student Ambassador Nov. 2023 – 2026
Beta Ambassador from Mar. 2024

- Hosted a Cloud Skills Challenge for 22+ international participants.

Technical workshops 2023 – 2025
DevFest Algiers, GDG Algiers, School of AI Algiers *Algiers, Algeria*

- Designed and delivered workshops for developer and student audiences, training more than 100 people: RAG in the era of LLMs, agentic AI, fundamentals of NLP, cloud and Azure fundamentals, and linear regression.

Certifications

Claude Certified Architect — Foundations *Anthropic, Aug. 2026*

Deep Learning Specialization *DeepLearning.AI (Coursera), Mar. 2024*

Machine Learning Specialization *DeepLearning.AI (Coursera), Dec. 2023*

Building Transformer-Based NLP Applications *NVIDIA, Feb. 2023*

Research Interests and Technical Skills

Research interests: temporal representation learning; temporally faithful information retrieval; retrieval-augmented generation; healthcare NLP; temporal information extraction; benchmark construction and evaluation.

ML and LLMs: PyTorch, Transformers, Scikit-learn, LangChain, LangGraph, ChromaDB, multi-agent orchestration

Engineering: Python, C, SQL, TypeScript, FastAPI, FastMCP, PostgreSQL, Docker, Git, CI/CD, GCP (Cloud Run, Cloud Build), React, Next.js

Other: MLIR (Linalg, TOSA), Flex/Bison, Salesforce (SOQL, Apex)

Languages

Arabic: native **English**: C1 (IELTS Academic 7.5) **French**: C1 (TCF)