

# Farrukh Nauman

AI Engineer / Agentic Systems Consultant | LLM Agents · API Integration · Data Platforms | PhD

[farrukh.nauman@inertialrange.com](mailto:farrukh.nauman@inertialrange.com) | (+46) 0702984959 | [fnauman.com](http://fnauman.com) | [inertialrange.com](http://inertialrange.com)

Swedish citizen | LinkedIn: [fnauman](#) | Github: [fnauman](#)

## SUMMARY

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I build reliable AI systems at the boundary of LLM agents, API/system integration, enterprise data platforms, and production automation—where chat-only demos break and real data, real tools, and real failure modes take over. I lead and ship: agentic workflows, API/CLI orchestration, text-to-SQL, large code migrations driven by coding agents, and validated SQL/Snowflake automation. Selected results:

- **Agent-driven migration validator:** cross-platform validation system (Databricks → Snowflake) from prototype to live dashboard in ~1 week using autonomous coding agents wired to Databricks/Snowflake CLIs.
- **5–10× faster, 50%+ cheaper:** SQL pipeline redesigned with row-level correctness validation; killed a faster but broken alternative via EXCEPT-based oracle checks.
- **Open-source agent framework:** `ts-agents`—autonomous time-series agents with strict JSON tool/API contracts, run manifests, and sandboxed execution.
- **Interim Team Lead:** 4–7 person DS & advanced analytics team; roadmap, stakeholder steering, and AI direction across telemetry analytics and GenAI automation.

## CURRENT FOCUS

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- **Agentic workflows:** tool/API-contract design, sandboxed execution, evals, run manifests, and inspectable artifacts—agents that produce results, not just chat.
- **Text-to-SQL & natural-language data access:** schema/business-context grounding, query validation, eval sets, failure taxonomies, governance.
- **Coding agents for large code changes:** evidence-preservation methodology, behavioral oracles, and `AGENTS.md` quality contracts for migrations and refactors.
- **System integration for LLMs & AI readiness:** Snowflake/Databricks pipelines, API/CLI orchestration, validation harnesses, and prototype-to-production workflows.

## SKILLS & TECH STACK

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<b>AI &amp; Agents</b>	AI Coding Agents (Claude Code, Codex CLI, Cortex Code), Agentic Workflow Architecture, Tool/API-Contract Design, LLM Agents (LangChain, OpenAI SDK), Text-to-SQL, RAG, LLM Evaluation & Failure Analysis, Fine-Tuning Readiness (LoRA/PEFT), Synthetic Data, Sandboxed Execution
<b>Data Platforms</b>	Snowflake, Azure Databricks, Spark, Snowpark, Azure Data Factory, SQL (advanced), API/CLI-Orchestrated Pipelines, Data-Stream Integration, Cross-Platform Validation
<b>ML &amp; Analytics</b>	PyTorch, Time Series, Predictive Modeling, Anomaly Detection, Computer Vision, Transformers, Weights & Biases
<b>Engineering</b>	Python (Expert, 8+ yrs), C/C++ (Proficient), Git, Docker, CI/CD, Streamlit, REST APIs, API Integration, Structured JSON APIs, System Integration, High Performance Computing
<b>Delivery &amp; Leadership</b>	Interim Team Lead, Roadmap Ownership, Stakeholder Steering, Project Scoping, Solution Architecture, Prototype-to-Production Delivery, ROI Analysis
<b>Languages</b>	English (Fluent), Swedish (Basic), Urdu (Native)

## EXPERIENCE

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### InertialRange Labs AB - Self-employed

Principal AI Consultant

Linköping, Sweden

Aug 2025 - Present

#### Engagement: Interim Team Lead – Data Science & Advanced Analytics (Sep 2025 - Jun 2026):

Enterprise Data & AI Platform Engagement

- Built a **cross-platform migration validation system** using AI coding agents: automated comparison of schemas, row counts, key distributions, and date ranges across dozens of tables—from zero to live dashboard in ~1 week. ([Case study](#))
- Wired **Databricks and Snowflake CLIs** to autonomous coding agents (Codex CLI / Cortex Code CLI), orchestrating external-system integration, validation, and reconciliation pipelines end-to-end—collapsing multi-day manual runbooks into hands-off workflows.
- **Agent-accelerated refactor:** redesigned a critical daily SQL pipeline from full recompute to **validated incremental processing** (5–10× speedup, projected 50%+ compute cost reduction). Killed a faster but fundamentally broken optimization using multi-scale benchmarks and EXCEPT-based oracle checks. ([Case study](#))

- **Interim technical lead** of a 4–7 person DS/analytics team—setting technical direction across telemetry analytics, ML, and GenAI automation.
- **Tech:** AI Coding Agents, LLM Agents (LangChain, OpenAI SDK), Snowflake, Databricks, Snowpark, Streamlit, REST APIs.

#### Independent projects (separate from client engagement):

- Open-sourced [ts-agents](#): a CLI toolkit for long-running autonomous agentic workflows on time-series data—machine-readable tool/API contracts, strict JSON envelopes, typed exit codes, run manifests, and sandboxed execution (local/Docker/Daytona/Modal). Applied to **machine activity recognition** from telemetry data for connected/edge-device workflows.
- Built a **Text-to-SQL pipeline against a production ERP database** (hundreds of tables, real data, not a tutorial schema): schema-aware retrieval to stay inside the context budget, a semantic layer mapping business vocabulary (e.g. “biggest buyers”, “SKUs that stopped selling”) to columns, metrics, and join paths, and result-level evaluation—models pick columns by name, so SQL that runs cleanly against an empty/null field still returns zeros and gets logged as “success”.
- Authored a practitioner framework for **large code migrations with coding agents**: evidence-preservation methodology, behavioral oracles, and AGENTS.md-based quality contracts. ([Case study](#))

#### RISE Research Institutes of Sweden AB

AI Researcher & Consultant

Linköping, Sweden

Jul 2021 - Aug 2025

**Project Lead: Sustainable Fashion AI Automation (2022-2025: 24 months):** Led two major initiatives: [Vinnova: AI for Circular Fashion](#) (Project Lead, ~9M SEK) and [CISUTAC](#) (AI Lead, ~2M SEK).

- **Challenge:** Manual quality inspection bottleneck in circular fashion supply chain—30% inconsistency, 25% cost overhead.
- **Solution:** End-to-end computer vision system for automated attribute detection; synthetic data pipeline to reduce annotation cost.
- **Impact:** 40% reduction in processing time, 50%+ reduction in data collection costs through synthetic data.
- **Recognition:** 1 of 5 projects featured at the [EU Sustainable AI event](#) (2023).
- **Tech:** PyTorch, Vision Transformers, CLIP, Gradio, Docker, Synthetic Data Generation.

#### Low-Energy IoT Solutions (2022: 4 months):

- Identified miniROCKET-based time-series methods for industrial connected/edge-device deployment, enabling real-time analysis at ~90% lower hardware cost than heavier alternatives.

#### Capability Building & Mentorship:

- Established AI mentorship program for Master’s thesis students; supervised projects spanning drone edge AI, air-traffic automation, traffic analysis, and anomaly detection.

#### Previous Research Positions

2009–2019

- **Research Fellow, Chalmers University of Technology:** Gothenburg, Sweden  
Complex systems modeling, large-scale data analysis 2018–2019
- **Research Scientist, Niels Bohr Institute:** Copenhagen, Denmark  
Simulation, forecasting, computational modeling 2015–2018
- **Research Assistant/PhD Student, Univ. of Rochester:** New York, USA  
Data analysis, predictive modeling 2009–2015

#### EDUCATION & CERTIFICATIONS

##### Microsoft Certified

Azure Data Engineer Certificate

Azure

2020

##### University of Rochester

PhD in Physics and Astronomy

Rochester, New York (USA)

Oct 2015

**Focus:** Complex Systems Modeling, Data Analysis, Computational Fluid Dynamics, High Performance Computing, C/C++

#### AWARDS & ACHIEVEMENTS

- Horton fellowship from Laboratory for Laser Energetics - full research funding award. 2010-2015
- Susumu Okubo Prize for highest performance on graduate comprehensive exam and excellence in coursework. 2011