

Seyed Vahid Ghayoomie

Computational Systems Engineer · big data, cloud, DevOps & MLOps, security, ML & HPC · 15+ years

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SUMMARY

Computational systems engineer with interdisciplinary expertise in big data architecture, cloud infrastructure, DevOps and MLOps, security and reliability, data science, machine learning, performance-oriented software development, and bio-inspired AI. More than 15 years of experience across application security and system design for banking and government institutions, a national bank's big-data platform and fraud-detection system (about five times cheaper than the stack it replaced), and the founding and technical leadership of a start-up, alongside independent consulting in cloud, data and AI.

Keeping up with science is part of my routine: two peer-reviewed papers and an invited talk at The Royal Society. Currently pursuing my continuing education through a Master's in High Performance Computing Engineering at Politecnico di Milano, with research interests in scalable simulation systems, parallel computing, and emerging quantum machine learning paradigms.

Based in Milan, Italy. Open to full-time roles in Milan (on-site or hybrid) and remote roles in Europe. Languages: English C1 (IELTS 7.0), Persian native, Italian and French in progress.

CORE SKILLS

Software development lifecycle — requirements engineering and use cases, multi-view architecture and UML, code review, unit, integration, fuzz and metamorphic testing, static analysis and coverage, V&V and traceability, CI/CD, Git and semantic versioning, containerised delivery (Docker, Apptainer), technical documentation, secure SDLC, project management

Data platforms — Hadoop, Spark, Hive, HBase, Kafka, BigQuery; PostgreSQL, MySQL, Oracle, MongoDB, Neo4j

AI & LLM systems — PyTorch, TensorFlow/Keras, scikit-learn, JAX, Hugging Face, GNNs, PINNs; LLMs, RAG, agents, MCP, evaluation; Claude, OpenAI, Gemini, Vertex AI, LangChain

Cloud, DevOps & MLOps — GCP, AWS, Azure, OpenStack; Docker, Kubernetes, Terraform; GitHub Actions, GitLab CI/CD; MLflow, Kubeflow, DVC; Prometheus, Grafana

HPC & scientific computing — modern C++ (17/20), CUDA, OpenCL, OpenMP, MPI; SLURM and Singularity/Apptainer on CINECA Galileo100; numerical methods, profiling and performance tuning

Security — penetration testing (white-box and black-box), secure-code review, fuzzing, reverse engineering, secure SDLC (OWASP, WASC, Microsoft SDL), WAF design, honeypots, SIEM, OAuth2/OIDC, secrets management

Languages & backend — Python (15+ years), C/C++, SQL, Bash, JavaScript/TypeScript, Java, C#, PHP, R, MATLAB; FastAPI, Django, Flask, REST and GraphQL APIs, webhooks, React

EXPERIENCE

Independent Research Engineer, Consultant & Start-up Founder

Sep 2018 – Present

Self-employed — AI, cloud, data & HPC

Milan / Tehran

- **HPC & scientific computing** (2025–): parallel and GPU software in modern C++ (CUDA, OpenCL, OpenMP, MPI) on CINECA's Galileo100 with SLURM and Apptainer: wormsim2, a real-time *C. elegans* simulator (Hodgkin–Huxley neural model and finite-element body) about 40× faster than serial, and AstraLog-HPC, a C++17 pipeline built as a full SE cycle.
- **Co-Founder & CEO, Neur Asal Ware** (2022–23): owned architecture, delivery and hiring; ran our cloud on OpenStack with GitLab CI/CD for e-commerce and real-estate clients and cut infrastructure cost by about 30%.
- **Agentic AI**: built and run a multi-agent system on Claude, with parallel sub-agents, custom MCP tools, structured outputs and automatic checks on every result, in daily use for real work; designed and built MatNeuron, an AI-powered web-based simulation environment for neural and biomechanical models.
- **Freelance consulting**: cloud architecture, secure-SDLC reviews, data-platform design and scientific software for clients.
- **Start-up mentoring**: teams building a portable point-of-sale platform for Day Bank, a property-share investment platform, a group-savings app, a React web-shop builder and a local blockchain platform on Stellar.

Big Data Platform Engineer & Data Scientist

Apr 2015 – Sep 2018

Sadad Informatics Corp. — Melli Bank Iran

Tehran

- Designed and rolled out an on-premise Hadoop/Spark platform on OpenStack (IBM BigInsights, Hortonworks, Hive, HBase, BigSQL, Flume, Ambari). It replaced a costly proprietary stack and cut data-infrastructure cost about five-fold.
- Co-designed a near-real-time fraud-detection system that combines streaming and batch ML scoring on banking transactions.
- Coordinated two engineering teams, for data infrastructure and data science, who built on the platform every day.
- Consulted on secure authentication, device fingerprinting ("digital DNA") and a mobile-banking security SDK.

Software & Systems Engineer — application and system design

Jul 2008 – Mar 2015

Tosan Corp. & Saba System Sadra Corp.

Tehran

- **System Engineer & Project Manager, Saba System Sadra** (2012–15): designed Azaram, a Linux web-application firewall with HTTPS offloading, load balancing, high availability, a self-healing monitoring layer and a signature-update centre, protecting government and financial web systems; led the team and the tests. Also worked on the Mavara SIEM and the Kandoo honeypot for network-security monitoring and threat research.
- **Software Security Engineer & Trainer, Tosan** (2008–12): white-box and black-box penetration testing, secure-code review, fuzzing and reverse engineering for banking and government systems; wrote security patches and secure-development policies.
- Trained developers on the secure SDLC (OWASP, WASC, Microsoft SDL), penetration testing and code review, and ran security assessments for banks, telecom and energy companies and public bodies (2010–14).
- Volunteer researcher, HoneyNet Project, Iranian chapter (2011): honeypots (Glastopf), malware and rootkit detection.

RESEARCH — ABOUT 20% OF MY WEEK

Senior Contributor, Volunteer Software Engineer & Scientist

Nov 2014 – Present

OpenWorm Foundation — open-source simulation of *C. elegans*

Remote

- Proposed and led **ChannelWorm** (2015–18): curated patch-clamp data from the literature, fitted Hodgkin–Huxley models, estimated kinetics for channels with no data from homologous channels, and built the Python APIs and validation tests used across the OpenWorm ecosystem to check that models match the experiments.

Research Assistant

Mar – Sep 2014

Laboratory of Systems Biology & Bioinformatics, University of Tehran

Tehran

- Predicted ion-channel kinetics from protein sequence with ML, optimisation and multiple-sequence alignment; digitised 200+ channel sequences with electrophysiology data from the literature.

Independent research projects

2018 – Present

- **chModeler / Chopen**: a compact ion-channel model (about 5 parameters) fitted in seconds for about 270 curated channels, with an ML predictor of kinetics from amino-acid sequence.
- **SC-PINN** (PoliMi, 2026): physics-informed graph neural network in PyTorch with ESM2 protein-language-model embeddings that predicts ion-channel gating, benchmarked against classical Markov and Hodgkin–Huxley models.
- **Interests**: bio-inspired AI, robotics and control, and quantum computing for scalable simulation.

PUBLICATIONS & TALKS

Invited speaker, The Royal Society, London, January 2018 — "Ion channels: from literature to computational model", at the meeting *Connectome to behaviour: modelling C. elegans at cellular resolution*.

Sarma GP, Lee CW, Portegys T, **Ghayoomie V**, et al. *OpenWorm: overview and recent advances in integrative biological simulation of Caenorhabditis elegans*. Phil. Trans. R. Soc. B 373: 20170382, 2018. doi:10.1098/rstb.2017.0382

Sarma GP, Jacobs TW, Watts MD, **Ghayoomie SV**, Larson SD, Gerkin RC. *Unit testing, model validation, and biological simulation*. F1000Research 5: 1946, 2016. doi:10.12688/f1000research.9315.1

EDUCATION

M.Sc. High Performance Computing Engineering — Politecnico di Milano

Sep 2025 – Present

Milan · Parallel Computing (CUDA/OpenMP), Advanced Methods for Scientific Computing (modern C++), Numerical Methods for PDEs, Numerical Linear Algebra, Numerical Analysis for ML, Applied Statistics, Software Engineering for HPC

M.Sc. studies, Mechatronics Engineering — Sharif University of Technology (Kish campus)

2019 – 2021

Coursework completed: Artificial Neural Networks, Advanced Automatic Control, Signals and Systems, Dynamics

M.Sc. studies, Biology / Biochemistry — Payame Noor University

2011 – 2014

Coursework completed; thesis (not defended): "Computational Modeling of Ion Channels and Structure-Function Relationship Analysis"

B.Sc. Information Technology Engineering — Islamic Azad University

2005 – 2010

GPA 17.43/20 (87%), among the top graduates of the cohort

CERTIFICATES

Google Cloud Skills Boost (2022–26) — Vertex AI, MLOps Fundamentals, BigQuery ML, Generative AI with Gemini, Responsible AI, Data Engineering on Google Cloud (badges: credly.com/users/vahid-ghayoomie)

IBM — Data Science Professional Certificate (2021) · **Linux Foundation** — Introduction to Cloud Infrastructure Technologies; Blockchain for Business with Hyperledger (2018)

Coursera — Python for Genomic Data Science (Johns Hopkins), Computational Neuroscience (U. Washington), Practical Machine Learning, Pattern Discovery in Data Mining (UIUC), Front-End Web Development with React (HKUST)