Dr. Vahram Martirosyan

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LinkedIn Profile | ResearchGate Profile | GitHub Profile
Abu Dhabi, UAE

Explainable Medical AI · HPC & Compiler Engineering · Systems Programmer · Academic Leader

Professional Summary

Ph.D. in Computational Mathematics with 20+ years of experience across research, industry, and academia. Core expertise spans **explainable medical AI**, **high-performance computing**, **compiler engineering**, and **systems programming**, with a consistent focus on making complex computational problems both efficient and interpretable.

Active researcher in transparent machine learning for clinical diagnostics and LLVM-based automatic parallelisation. Former industry engineer and technical lead, startup CEO, and head of a Russian Academy of Sciences laboratory. Currently **Assistant Professor and Course Team Leader** at Higher Colleges of Technology, Abu Dhabi.

Technical Skills

- **Explainable / Medical AI:** Polynomial Regression Models (PRMs), feature importance, interpretable classification for clinical data, regression-based diagnostic models, Statistics & Probability.
- **Machine Learning:** Supervised learning, regression modelling, interpretable model design, Python, PyTorch.
- **HPC & Parallelism:** LLVM/Clang (compiler pass development), OpenCL, MPI, POSIX Threads, auto-vectorisation, heterogeneous CPU-GPU execution, Xilinx ACAP.
- **Systems Programming:** C/C++ (expert), Linux kernel modules, device drivers (Ext4, XFS, JFS, BtrFS), WIN32 API, GTK+, IoT/embedded systems.
- **Web & Databases:** PHP/MySQL, ASP.NET/C#/MS SQL Server, SQL.
- **Tooling:** Git, Linux/Unix, LaTeX.
- **Languages:** Armenian (native), Russian (fluent), English (fluent).

Professional Experience

Research & HPC Engineering

Chief Executive Officer Jun 2022 – Jul 2023
System View Armenia, Yerevan

- Developed an LLVM/Clang-based auto-vectoriser for Xilinx ACAP boards as part of the *Visual System Integrator* toolchain.

Head of System Programming Laboratory Jan 2009 – Jul 2013
Russian-Armenian (Slavonic) University / ISP RAS, Yerevan

- Led the System Programming Lab of the Institute for System Programming of the Russian Academy of Sciences.
- Implemented Linux Foundation verification projects for system libraries (LibStdCXX, XLib, GTK+) and kernel modules (Ext4, XFS, JFS, BtrFS) using the Spruce dynamic-verification system.

Junior Research Scientist 2003 – 2005
Institute of Mathematics, National Academy of Sciences of RA, Yerevan

- Parallelisation of numerical algorithms for integral equations and interpolation using MPI.

Industry Engineering & Leadership

Director of Software Engineering Sep 2023 – Dec 2023
Plat.AI, Yerevan, Armenia

- Led the software engineering team at Plat.AI's Armenian branch.

Associate Software Development Manager Oct 2021 – Jun 2022
HelpSystems Armenia, Yerevan

- Led engineering teams on enterprise-level software products following promotion from Principal Engineer.

Principal Software Engineer / Team Lead Feb 2017 – Oct 2021
HelpSystems Armenia, Yerevan

- Led a team delivering enterprise software; technical ownership across design, implementation, and code review.

Software Architect (Contract) 2018 – 2020
Priotix, Yerevan

- Designed and built a complete smart-home IoT system from the ground up.

Principal Software Developer Jan 2016 – Feb 2017
Optym, Yerevan

Senior Software Developer Aug 2015 – Dec 2015
Optym, Yerevan

- Developed optimisation algorithms for logistics scheduling solutions.

Senior Software Developer Aug 2013 – Jul 2015
ArdInnoTekh LLC, Yerevan

- Back-end development for an enterprise-level logistics scheduling and optimisation framework.

Software Developer Oct 2006 – Dec 2008
ISMoTech, Yerevan

- Firmware development for telematic devices; Windows applications in C++/C#; ASP.NET Web Services in C#.

Software Developer Mar 2005 – Oct 2006
Lycos Europe

- Web development using PHP/MySQL technologies.

Software Developer Sep 2004 – Apr 2005
South Tech Consulting Inc., Yerevan

- Web application development using ASP.NET/C#/MS SQL Server.

Software Developer Apr 2004 – Oct 2004
NATK LLC, Yerevan

- Developed internet shop applications in PHP/MySQL and ASP.NET/C#/MS SQL Server.

Teaching & Academia

Course Team Leader Jan 2025 – Present
Higher Colleges of Technology, Abu Dhabi, UAE

- Managing and guiding a team of lecturers across multiple campuses for the System Architecture & Integration course.
- Preparing and maintaining course materials and assessment strategies; ensuring standardised delivery across campuses.

Assistant Professor, Computer Information Science Jan 2024 – Present
Higher Colleges of Technology, Abu Dhabi, UAE

- Full-time faculty member teaching: Fundamentals of Programming (Java), System Architecture, IoT & Security, Data Structures & Algorithms, Statistics and Probability.

Informatics Teacher (Contract) Sep 2023 – Dec 2023
PhysMath School After A. Shahinyan, Yerevan, Armenia

- Taught Informatics course at a specialist physics-mathematics secondary school.

Faculty Lecturer (Contract) Jan 2023 – Dec 2023
Université française en Arménie (UFAR), Yerevan

- Courses: Computer Architecture I, C Programming.

Visiting Lecturer (Contract) Aug 2022 – Jan 2023
American University of Armenia, Yerevan

- Taught Introduction to Computer Science course.

Senior Lecturer (Contract) Feb 2021 – Dec 2023
Yerevan State University, Faculty of Informatics & Applied Mathematics

- Taught Operating Systems; supervised research in system programming and applied mathematics.

Founder & Lecturer (Part-time) Jan 2019 – Jun 2023
MutEx School, Yerevan

- Founded and ran a programming school; delivered courses and public lectures.

Lecturer Sep 2013 – Dec 2019
Armsoft, Yerevan

- Taught Operating Systems at Armsoft's Computer Science Learning Center.

Lecturer Feb 2015 – Jun 2015
Armenian Code Academy, Yerevan

- Taught .NET / C# programming course.

Senior Lecturer Feb 2007 – 2014
Russian-Armenian (Slavonic) University, Yerevan

- Courses: Linux/POSIX Programming, Win32 API, Linux Device Driver Development, GUI (GTK+), Operating Systems, System Programming, DBMS.

Education

Ph.D., Computational Mathematics 2006 – 2009
Yerevan State University

Dissertation: "Construction of an Algorithm for the Pseudoinversion of Bidiagonal Matrices and an Investigation of its Parallelization"

M.Sc., Informatics and Applied Mathematics 2004 – 2006
Yerevan State University

B.Sc., Informatics and Applied Mathematics 2000 – 2004
Yerevan State University

Certifications

AI, Machine Learning & Data Science

- Fundamentals of Deep Learning — *NVIDIA*, Apr 2025
- Artificial Intelligence Foundations: Thinking Machines — *LinkedIn*, Jul 2024
- Introduction to Artificial Intelligence — *LinkedIn*, Jul 2024
- Advanced NoSQL for Data Science — *LinkedIn*, Jan 2025
- Statistics Foundations 1: The Basics — *LinkedIn*, Sep 2024

Embedded Systems, FPGA & Hardware

- C Programming for Embedded Applications — *LinkedIn*, Nov 2024
- Introduction to FreeRTOS and Basic Task Management — *LinkedIn*, Nov 2024
- Getting Started with RISC-V — *LinkedIn*, Jul 2024
- Learning Verilog for FPGA Development — *LinkedIn*, Jul 2024
- Learning FPGA Development — *LinkedIn*, Jul 2024
- Introduction to Quantum Computing — *LinkedIn*, Jul 2024

Software Architecture & Engineering

- Software Architecture: Domain-Driven Design — *LinkedIn*, Jul 2024
- Microservices Foundations — *LinkedIn*, Jul 2024
- Microservices: Asynchronous Messaging — *LinkedIn*, Jul 2024
- Microservices: Security — *LinkedIn*, Jul 2024

Leadership & Communication

- How to Be an Effective Manager to Drive Impact — *LinkedIn*, Jul 2024
- Storytelling to Influence Leadership and Decision Makers — *LinkedIn*, May 2024
- Improving Your Thinking — *LinkedIn*, Jul 2024
- Leading with Emotional Intelligence — *LinkedIn*, Apr 2019
- Public Speaking Foundations — *LinkedIn*, Feb 2019

Publications

Preprints & Research Papers

- **Martirosyan, V.** "Stagewise Regularized Polynomial Regression: A Hybrid Optimization Strategy for Medical Diagnosis on Small Datasets." Feb 2026.
  (86.7% accuracy on UCI Cleveland Heart Disease; 93% model compression; ≈36 FLOPs/prediction.)
- **Martirosyan, V.** "Polynomial Regression Models for Interpretable Machine Learning: Theory, Optimization, and Medical Applications." Feb 2026.
- **Martirosyan, V.** "Heart Disease Diagnosis Using Third-Order Polynomial Regression Models with L2 Regularization." Feb 2026.
  (81.8% accuracy, 10-fold CV; full interpretability via explicit polynomial coefficients.)
- **Martirosyan, V.** "Explainable and Efficient Digit Classification via Polynomial Regression Networks: A Transparent Alternative to Deep Learning." Jan 2026.
- **Martirosyan, V.** "HPC++: An LLVM-Based Automatic Parallelization Framework with Heterogeneous CPU-GPU Execution." Feb 2026.
  (Peak speedup 2009× on GPU; 32.1× on CPU.)

Conference Papers

- **Martirosyan, V.** et al. "Testing of Linux File System Drivers." *Proceedings of ISP RAS*, vol. 23, Moscow, Dec 2012.
- **Martirosyan, V.** et al. "The Spruce System: Quality Verification of Linux File System Drivers." *SYRCoSE 2012*, May 2012.
- **Martirosyan, V.** et al. "Dynamic Verification of Linux File System Drivers." *CSIT 2011*, Sep 2011.
- **Martirosyan, V.** et al. "The Spruce System: Linux Kernel Module Verification Automation" (in Russian). *7th Annual Conference of RAU*, Dec 2012.
- **Martirosyan, V.** et al. "Fault Simulation in Linux Kernel Module Verification" (in Russian). *7th Annual Conference of RAU*, Dec 2012.
- **Martirosyan, V.** et al. "Linux Verification – Challenge of Today." *7th Annual Conference of RAU*, Dec 2012.
- **Martirosyan, V.** et al. "X2C – XML To Code: Advantages of Standards." *4th Scientific Annual Conference of RAU*, Dec 2009.
- **Martirosyan, V.** et al. "X2C: Code Generation Technology."

Books & Tutorials

- **Martirosyan, V.** *Programming via Operating Systems, Second Edition.* Hilfmann Press, Sep 2024.
- **Martirosyan, V.** et al. *Tutorial: Basics of Programming in OS Linux Environment* (in Russian). MIPT, Apr 2011.
- **Martirosyan, V.** et al. *Tutorial: Programming in GNU/Linux Environment – From System Calls to the GUI* (in Russian). RAU Publishing, Dec 2010.

Translations

- *Jinnetic Engineering* by Richard Stallman, translated into Armenian. Dec 2010.