

Mohammad Farhadi, MD

Physician | Clinical AI Researcher | Health-Technology Co-Founder

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Professional PROFILE

I am a physician and software developer with experience working at the intersection of clinical practice, applied AI, and health technology. My work has involved developing and evaluating clinical decision-support systems, grounded generative AI longitudinal clinical data analysis, anomaly detection, backend services, and integration with hospital information systems. As Co-Founder and Technical Lead of Synara, I lead multidisciplinary teams in translating complex clinical requirements into scalable decision-support tools used across multiple hospitals in Iran. My research focuses on advancing clinically grounded, rigorously evaluated, and reliable AI that improves patient safety and clinical decision-making.

EDUCATION & MEDICAL REGISTRATION

Doctor of Medicine (MD) | Shiraz University of Medical Sciences

Jan 2018 - Feb 2025

Shiraz, Iran

Registered Physician | Islamic Republic of Iran Medical Council (IRIMC)

Membership Code 228318

RESEARCH AND PROFESSIONAL EXPERIENCE

Co-Founder and Technical Team Lead | Synara

Aug 2024 – Present

Shiraz, Iran

Synara is a seed-stage health technology startup developing AI-enabled clinical decision support systems that are currently deployed across **43 hospitals**, supporting over **3,500 physicians** and approximately **700,000 patients**. (synara.ir)

- Led the end-to-end development and deployment of **SynRx**, an explainable clinical decision-support system that detects drug–drug interactions, contraindications, and dosage mismatches and delivers patient- and context-specific prescribing guidance.
- Engineered scalable clinical-data and inference pipelines using **Python, FastAPI, MySQL, RabbitMQ, and Docker**; SynRx processed 1.2M+ medication-safety alerts.
- Developed and evaluated a **Retrieval-Augmented Generation (RAG)** pipeline grounded in verified pharmacology sources, producing traceable evidence used to build and maintain SynRx’s curated knowledge base, clinical decision rules, and validation datasets.
- Architected production-grade longitudinal laboratory data pipelines, ingesting and normalizing **2M+ records** from heterogeneous hospital systems into patient- and admission-level time series; implemented incremental synchronization, batch processing, idempotent upserts, data validation, and monitoring across **50+ biomarkers**.
- Developed an interpretable temporal reasoning layer that aligns laboratory trajectories with medication exposure and patient context to generate patient-specific risk signals for early recognition of **acute kidney injury (AKI), drug-induced liver injury (DILI), infection, and evolving clinical deterioration**.
- Architected **SynVx**’s (Syn Vision) clinical data-integration layer, extracting data from heterogeneous legacy Hospital Information Systems and harmonizing prescriptions, medication-safety events, laboratory results, clinical records, and financial data into a unified longitudinal data model.

- Developed validated data models and interactive dashboards using **SQL and Metabase** to monitor prescribing patterns, drug–drug interactions, adverse drug reactions, laboratory trajectories, and clinical-financial KPIs, enabling clinicians and hospital managers to identify safety trends and operational anomalies.
- Owned the end-to-end lifecycle of clinical services—from prototyping and offline evaluation to containerized deployment, asynchronous inference orchestration, observability, and legacy system integration—translating clinician requirements into auditable, fault-tolerant, and scalable production features.

Clinical Reasercher | Clinical Research Development Center (CRDC), Amir Oncology Hospital Jan 2023 – Present
Shiraz, Iran

- Engineering and fine-tuning a **protein large language model (pLLM)** pipeline using IBM MAMMAL (*Molecular Aligned Multi-Modal Architecture and Language*) to predict antibody–antigen binding affinity across 1.2M biological records, with subtype-correct H1N1/H3N2 preprocessing, leakage-resistant evaluation, and reproducible training.
- Collaborated with *PanCanAID* and develop a multithreaded Python client for authenticated, resumable retrieval and structured organization of DICOM CT studies from hospital imaging systems, streamlining dataset collection for AI-assisted pancreatic-cancer diagnosis.
- Performed formal analysis of 386,377 beat-level Pulse Index Continuous Cardiac Output (PiCCO) observations from ICU admitted pediatrics patients using unsupervised machine learning, identifying four reproducible hemodynamic states to support precision decision-making in pediatric intensive care.
- Contributed to a decade-long oncology drug–drug interaction study spanning **92,565 admissions** and **18,644 patients**, using robust Poisson regression and **latent class analysis (LCA)** to identify risk determinants and clinically distinct patient phenotypes and evaluate a hospital-adapted clinical decision-support system.
- Contributed to the scientific and technical development of an oncology registry covering more than 11,000 patients and 94,000 longitudinal admissions, supporting clinical research and real-world evidence generation.
- Supported multidisciplinary registry-based research and scientific dissemination, contributing to some peer-reviewed publications, international conference abstracts—including ASCO 2025—and evidence-synthesis studies across oncology, infectious diseases, bioinformatics, and clinical AI.

Software Engineer | Herrmann AG

Jan 2021 - Jan 2023

Bavaria, Germany

tackled a 14-year-old challenge by designing an intelligent fault detection and debugging system for car suspension processes, enhancing system adaptability, precision, and long-term reliability through innovative infrastructure and monitoring solutions

- Designed an end-to-end fault-detection and diagnostic system for automotive suspension testing, addressing a long-standing sensor-analysis challenge. The system connected data acquisition, decoding, time-series processing, feature extraction, and pattern detection to support more consistent and adaptable debugging workflows.
- Reverse-engineered sensor data stored in a proprietary EFT format by examining binary headers, mapping the underlying file structure, and decoding Base64-encoded payloads. This restored access to previously inaccessible raw sensor measurements and enabled reproducible downstream analysis.

- Developed a Python pipeline for preprocessing time-series sensor data and extracting diagnostic features. Applied Fast Fourier Transform (FFT) techniques to analyze frequency-domain behavior and recurrent convolutional models to identify complex temporal patterns associated with system faults. Optimized performance-critical CPython components, improving execution speed by up to 8x in key processing stages.
- Developed a JavaScript communication module by intercepting connections from the manufacturer's legacy software and analyzing its packet structure. The module enabled direct browser-based sensor communication and control, supporting remote access and migration of previously desktop-dependent functionality to a cloud-compatible architecture.

CLINICAL EXPERIENCE

General Practitioner - Oncology and Hematology | Amir Oncology Hospital

2023 - Present

Shiraz, Iran

- Provide inpatient and outpatient care for adult and pediatric patients with hematologic and solid malignancies at a tertiary oncology referral center, including clinical assessment, treatment monitoring, and management of oncologic emergencies and therapy-related complications.
- Support patients throughout hematopoietic stem cell transplantation, including pre-transplant evaluation, post-transplant monitoring, and recognition and management of infectious, hematologic, and treatment-related complications.
- Collaborate with multidisciplinary oncology teams to deliver evidence-based care and serve on the Hospital Infection Prevention and Control Committee, contributing to infection surveillance, antimicrobial stewardship, and institutional infection-control policies.

Emergency Medicine Physician | Qaem Hospital

2023 - 2024

Firooz Abad, Iran

- Assessed, stabilized, and managed critically ill and injured patients in a high-volume emergency department, covering acute medical, surgical, and oncologic presentations.
- Coordinated investigations, specialist consultations, admissions, and transfers to support timely multidisciplinary care.

PUBLICATIONS

PUBLISHED

Abdipour Mehrian, S. R., Pishdad, P., Mansouri, Z., Sharifi, M., Meftah, E., **Farhadi, M.**, Habibzadeh, A., & Amanati, A. (2026). Impact of COVID-19 on survival and relapse in pediatric cancer patients. *Archives of Pediatric Infectious Diseases*, 14(4), e160947.

[doi:10.5812/apid-160947](https://doi.org/10.5812/apid-160947)

Abbasi, A., Amanati, A., Jaafar Nejad, A., **Farhadi, M.**, Malekpour, M., Abdipour Mehrian, S. R., Meftah, E., Homayounifar, F., & Farkarian, A. (2025). Network signatures of oncology prescribing patterns: Insights from a decade of hospital data. *Annals of Oncology*.

Mohammad Hossein, E., Pirahmadi, A., Abbasi, A., Khosravi, M. B., Valipour, A., & **Farhadi, M.** (2025). The effect of aminophylline on renal function after liver transplant surgery. *Journal of Anesthesiology and Pain*, 15(4), 44-56.

PREPRINTS

Abbasi, A., **Farhadi, M.**, Sadegh, R., Kavari, K., Rastaghi, F., Parvizi, F., Azadian, Z., Rajabi, A. H., & Nasr, A. (2026). Correlation between clinical presentation and brain CT findings in acute dizziness: A retrospective cross-sectional analysis at a tertiary referral center. *medRxiv* [Preprint]. [doi:10.64898/2026.06.25.26356549](https://doi.org/10.64898/2026.06.25.26356549)

ACCEPTED FOR PUBLICATION

Abbasi, A., **Farhadi, M.**, Sadegh, R., Kavari, K., Rastaghi, F., Parvizi, F., Azadian, Z., Rajabi, A. H., & Nasr, A. (2026). Predictive factors of abnormal brain CT scan in patients with opioid poisoning: A single-center study. *Medical Journal of the Islamic Republic of Iran*. (Accepted for publication.)

MANUSCRIPTS UNDER REVIEW

- Abbasi, A., **Farhadi, M.**, Nasiri, Z., Amanati, A., & Molavi Vardanjani, H. (2026). Real-world implementation and evaluation of an AI-enabled drug-drug interaction clinical decision support system: A mixed-methods study using RE-AIM and CFIR. (*Under review.*)
- Abbasi, A., **Farhadi, M.**, Malekpour, M., Midjani, F., Amanati, A., Abdipour Mehrian, S. R., & Meftah, E. (2026). Leveraging multi-task protein language model for robust sequence-only antibody-antigen affinity prediction: A tool for translational microbiology and emerging pathogen response. (*Under review.*)
- Abbasi, A., **Farhadi, M.**, Homayounifar, F., & Amanati, A. (2026). A decade of drug-drug interactions in oncology: Clinical trends, risk determinants, and CDSS-based insights from a referral teaching hospital. (*Co-first author; under review.*)
- Abbasi, A., Goodarzian, M. R., Seifi, S., **Farhadi, M.**, Rastegar Kazerooni, A., Faghihi, S. A., & Ghazanfari, S. (2026). Clinical teaching during crises: An experience from Iran. (*Under review.*)
- Abbasi, A., Amanati, A., Razmjouyi, P. *, **Farhadi, M.**, Taghizadeh, P., & Valiee, S. (2026). Fertility preservation challenges from pediatric oncologists' perspectives: A qualitative study. (*Under review.*)
- Bahmanipour, K., Abbasi, A., **Farhadi, M.**, Homayounifar, F., Abdipour, R., Akbari, M. R., & Molavi Vardanjani, H. (2026). Drug interactions in Iran: Findings from the PERSIAN Cohort Study. (*Under review.*)
- Yarahmadi, D., Rajabi, A., Abbasi, A., Ghorbanpour, A., Emami, M., Dehghani, M. R., Seifi, S., Shirazi, M. A., Jafari Nejad, A., **Farhadi, M.**, Shamohammadi, M. S. (2026). CDKN2A/p16 Promoter Hypermethylation and Related Biomarker Alterations in Colorectal Cancer: An Umbrella Review of Survival and Clinicopathological Evidence

CONGRESS PARTICIPATION & POSTER PRESENTATIONS

- **Bridging Hierarchies: Interprofessional Education for Collaborative Healthcare in Iran**; First International Congress of Medical Education, Sebta University of Medical Sciences (ISUMEC 2025), Iraq, 2025 (*Presenting author; poster presentation; Abstract ID 276*).
- **The Role of Cytokines in the Prediction of Future Infections Among Patients with Hematologic Malignancies**; 17th International Clinical Microbiology Congress (17th ICCM), Professor Alborzi Clinical Microbiology Research Center, Shiraz University of Medical Sciences, Mashhad, Iran (*Presenting author*).
- **Impact of COVID-19 on Survival and Relapse in Pediatric Cancer Patients**; 18th International Clinical Microbiology Congress (18th ICCM), Professor Alborzi Clinical Microbiology Research Center, Shiraz University of Medical Sciences, Shiraz, Iran (*Presenting author; subsequently published in Archives of Pediatric Infectious Diseases, 14(4), e160947; Manuscript ID 160947*).
- **CYP2C19 Genetic Polymorphisms in Children and Young Adults with Cancer: A Cross-Sectional Study**; 18th International Clinical Microbiology Congress (18th ICCM), Professor Alborzi Clinical Microbiology Research Center, Shiraz University of Medical Sciences, Shiraz, Iran (*Presenting author; subsequently accepted for publication in Archives of Pediatric Infectious Diseases; Manuscript ID 162809*).

SELECTED CLINICAL AI AND OPEN-SOURCE PROJECTS

- Cancer Drug Sensitivity - SMILE** | [Public GitHub repository](#) 2021
- Developed a Python deep-learning project using the GDSC2 cancer drug-sensitivity dataset.
- Medical Imaging Prototypes** | [Public GitHub repositories](#) 2020 - 2021
- Built open-source prototypes for skin-cancer classification with convolutional neural networks and TensorFlow, bone-age prediction from RSNA X-ray images, and colorectal histopathology analysis.
- DICOM Downloader Client** | [Public GitHub repository](#) Updated 2025
- Created a Python headless client for downloading DICOM files from a LITE web browser.
- Additional Computational Projects** | [Public GitHub repositories](#) 2019 - Present
- Maintains 32 public repositories spanning reinforcement learning, atmospheric dispersion modelling, sensor reconstruction, research tooling, backend systems, and applied machine learning.

AWARDS AND DISTINCTIONS

- Gold Medal - National Olympiad of Medicine** Jul 2021
Ministry of Health and Medical Education
- Silver Medal - 8th National Nanotechnology Olympiad** Jan 2016
Iran National Nano and Micro Technologies Innovation Council (INNMTIC)
- Bronze Medal - 7th National Nanotechnology Olympiad** Jan 2015
Iran National Nano and Micro Technologies Innovation Council (INNMTIC)