

Ahmet Erdem Pamuk

+90 542 432 22 46 | ahmeterdempmk@gmail.com | [GitHub](#) | [Google Scholar](#)

Research Interests

Natural Language Processing, Agentic LLMs, Multi-Agent Systems, Voice AI, Quantum Machine Learning (Exploratory)

Education

Mustafa Hakan Güvencer Science High School

Science High School Program

Ankara, TR

Sep 2023 – Present

Deneyap Technology Studios Summer School

Design & Production, Robotics & Coding

Ankara, TR

Jul 2024 – Aug 2024

Work Experience

Member of Technical Staff

Jun 2026 – Present

Freja (YC S25)

- Researched Turkish/English speech recognition and synthesis models; developed training, data curation, and evaluation pipelines for production speech models; led the research and development of the first Turkish foundation TTS model (183M parameters) trained from scratch.

Research Engineer

Apr 2025 – Jun 2026

MotionShark

- Led end-to-end development; built frontend interfaces, backend systems, and cloud infrastructure; partnered with leading U.S. exam prep company, Prep Expert (Mark Cuban + Shark Tank).

Research Engineer Intern

Feb 2025 – Apr 2025

MotionShark

- Led development of an AI-powered study planner that dynamically generates personalized SAT schedules using LLM reasoning with algorithmic fallback; shipped full backend + frontend integration.
- Designed and deployed SAT Math & English diagnostics engine enabling real-time skill breakdowns, performance tracking, and adaptive next-step recommendations.
- Built full question bank and mock exam platform, including filtering logic, bookmarking, analytics dashboards, sticky trackers, progress journeys, and achievement systems.
- Re-architected AI Tutor conversational flow with structured system and behavior prompts to ensure natural dialogue and context-correct guidance.
- Improved LLM reliability via retry logic, structured outputs, fallback planning, OCR-assisted reference detection, and error-state guardrails.
- Built admin prompt editor and RTDB config panel allowing non-technical teammates to tune agent behavior without redeployment.
- Implemented engagement systems: streaks, badges, avatars, progress bars, mascots, dynamic UI, and learning journeys.
- Shipped full SAT mock-exam workflow with planner updates, progress logs, performance breakdowns, and personalized practice generation.
- Implemented emotion-aware engagement recovery strategies to detect inactivity or confusion and proactively re-engage students.
- Engineered real-time tutoring agent pipeline with structured tool-call orchestration (highlight, crossout, board-write), reducing hallucinations.
- Designed a conversational pacing and turn-taking system to prevent self-answering and ensure natural live audio tutoring.

Co-Founder & Tech Lead

Feb 2025 – Jul 2025

Piyonist

- Developed a state-of-the-art chess engine and personalized AI chess coaching platform for Turkish users; partnered with the Turkish Chess Federation; designed and deployed piyonist.com landing page.
- Implemented advanced algorithms, including Monte Carlo Tree Search and Minimax with large-scale datasets; built AI coaching agents delivering adaptive, personalized feedback across all skill levels.

AI Researcher

Nov 2024 – Mar 2025

ARF

- Evaluated and benchmarked 15+ LLMs for educational use cases; conducted research on QA and text-to-speech performance; worked with DeepSeek-R1/V3, Llama3, Qwen2.5, GPT-4o, GPT-4o-mini, GPT-o1, GPT-o3.

Software Engineer Intern

Jun 2024 – Aug 2024

Sobuman Software

- Developed Partogo, an all-in-one e-commerce integration platform for cargo tracking and invoicing, serving 50+ businesses by 2025.
- Designed UI from scratch using C# Windows Forms; refactored codebase for maintainability.

Extracurricular Activities

Various Volleyball Teams

September 2020 – Present

Athlete (Spiker)

- Participated in the school tournaments; selected & represented Ankara in the Anatolian Stars League; secured 1st place in the Ankara regional tournament.

School Chess Team

September 2023 – Present

Player

- Participated in the school tournaments; placed 2nd place in the Ankara regional tournament.

Kaggle Türkiye Community

January 2025 – August 2025

Board Member

- Managed a 2,000+ member AI/ML community; organized Kaggle talks; created Medium blogs and YouTube tutorials helping beginners enter competitions.

GencTek Young IT Ecosystem

September 2024 – June 2025

School Representative

- Attended organizational meetings; maintained the GencTek Summit'25, bridging 500 high school students and sector professionals in Ankara.

Publications

- **EchoLLaMA: 3D-to-Speech with Multimodal AI** — Pamuk A.E., Kocabay S.T., Ozdemir E.K. Submitted to Preprints.org, 2025. [\[Paper\]](#)
- **Superpositional Gradient Descent: Harnessing Quantum Principles for Model Training** — Pamuk A.E.*, Ozdemir E.K.*, Kocabay S.T. Accepted to IEEE International Conference on Quantum Artificial Intelligence 2025. [\[Paper\]](#)
- **QDPO: Quantum-Decoupled Policy Optimization for Stable Multi-Reward Reinforcement Learning** — Pamuk A.E. Accepted to IEEE World Congress on Computational Intelligence, QNRL: Advances in Quantum Neural and Reinforcement Learning Workshop 2026.
- **ansatzu: Automated Variational Quantum Circuit Design and Optimization with Shot-Aware Hyperparameter Search** — Pamuk A.E., Yurtseven E. Accepted to IEEE International Conference on Quantum Computing & Engineering, 4th International Workshop on Quantum Machine Learning: From Research to Practice 2026.
- **FreyaTTS: A Compact Tokenizer-Free Non-Autoregressive Flow-Matching Model for Turkish Speech Synthesis** — Pamuk A.E., Yentür Ö., Bayrak A.T., Öztürk Y.A.S., Yavuz M. arXiv preprint arXiv:2607.09530, 2026. [\[Paper\]](#)

Academic Service

ICML 2026 FoGen Workshop

May 2026

Reviewer

- Reviewed submissions for the Foundations of Deep Generative Models (FoGen) Workshop at ICML 2026.

ICLR 2026 DeLTa Workshop

Feb 2026

Reviewer

- Reviewed submissions for the Deep Generative Model in Machine Learning: Theory, Principle and Efficacy (DeLTa) Workshop at ICLR 2026.

Research Projects

Polyp Segmentation from Colonoscopy Images

- Developed DeepLabV3+ pipeline with EfficientNet-B3 achieving 97.98% IoU and 1.11% Dice Loss; trained on 1612 images from CVC-ClinicDB and Kvasir-SEG datasets; benchmarked DeepLabV3+, SegFormer, U-Net, Swin Transformer architectures.

Cardiomegaly Detection & Cardiothoracic Ratio Estimation

- Implemented DeepLabV3+ with EfficientNet-B4 achieving 95.13% IoU and 3.01% 1-SMAPE; external validation on 150+ images achieved F1 score of 0.8889.

Accomplishments & Awards

- Member of Team Türkiye, European Olympiad in Artificial Intelligence 2026.
- Silver Medalist, Kaggle AI Mathematical Olympiad 2026 - Rank 54/4138 (Top 2%).
- 1st Place - TRY 100K Winner, Istinye University x Eviddeep DataMedX Hackathon 2 2026.
- 1st Place (Kaggle Stage) & 3rd Place Overall - TRY 100K Winner, Trendyol Group x TEKNOFEST 2026 E-Commerce Hackathon
- Rank 54/3365 (Top 2%), Kaggle Bank Classification Competition.
- Rank 95/3310 (Top 3%), Kaggle Predict Podcast Listening Time Competition.
- Rank 30/355 (Top 8%), Elucidata Global AI Hackathon '25.
- 2nd Place - TRY 30K Winner, Istinye University x Türk Telekom x Eviddeep DataMedX Hackathon 2025.
- Finalist (Top 3%), Trendyol Group x TEKNOFEST 2025 E-Commerce Hackathon.
- Finalist (Top 1%), TUBITAK x TEKNOFEST 2025 AI in Aviation Competition.
- Finalist (Top 1%), TUSEB x TEKNOFEST 2025 AI in Healthcare Competition.
- Finalist (Top 8%), Trendyol Group x TEKNOFEST 2024 E-Commerce Hackathon.
- Academic High Honors Award (9th Grade; Awarded for Academic Excellence and Exemplary Conduct).
- Academic Honors Award (9th–11th Grades; Awarded for Outstanding Academic Achievement).

Languages

English (Fluent), Turkish (Native)