

Samaneh Shirinnezhad

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Education

B.Sc. in Computer Engineering

Jundi Shapur University of Technology

September 2012 – December 2016

Dezful, Iran

- **Capstone Topic:** Design and Development of a VR Game with Motion Sensor Integration for Mobile Platforms using Unity and Google Cardboard
- **GPA:** 145 credits program with GPA of 17.51/20. GPA of the last two years is (3.81 / 4.00)
- **Selected Courses:** Advanced Programming, Algorithm Design, Data Structures, Artificial Intelligence, Data Transmission, Discrete Structures, Internet Engineering

Research Interests

- Human-Computer Interaction
- Interaction & UI/UX Design
- Information Visualization
- Applied Machine Learning
- Natural Language Processing
- AI in Healthcare & Education

Skills

Languages: English (IELTS Academic – Overall Band Score: 8.5), Persian (Native)

Programming Languages: C++, C#, Java, Python, R, Julia, SQL

Data Science & Machine Learning: NumPy, Pandas, SciPy, Scikit-learn, TensorFlow, Keras, PyTorch, Gensim, NLTK, SpaCy, Transformers

Web Development: HTML, CSS, JavaScript, TypeScript, React, Next.js, Node.js (Express), PostgreSQL

Dev & Research Tools: Jupyter Notebook, RStudio, LaTeX/Overleaf, Tableau, Excel, NVivo, Git, Docker

Design Tools: Figma, Adobe Creative Suite (Photoshop, Illustrator, Premiere)

Virtual & Augmented Reality: Unity3D, VR SDKs

Recent Publications

C=Conference, J=Journal, P=In Press, S=Submitted, U=Under Review

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Across these works, I contributed to advancing energy sustainability and surfaced the human-centered challenge of communicating trade-offs, motivating my current focus on explainable AI and visualization.

- [J.4] **Navigating the Canadian Renewable Energy Landscape through Bibliometric and Machine Learning Insights.**
Samaneh Shirinnezhad, & Davoud Ghahremanlou.
International Journal of Global Warming, Vol. 37, No. 1, 2025. [DOI]
- [J.3] **Optimizing Hybrid Energy Solutions for Enhanced Energy Resilience and Sustainability in Repulse Bay Using HOMER Pro.**
A. Ashouri Vajari, S. Kotian, S. Shirinnezhad, et al.
Journal of Green Economy and Low-Carbon Development, 3(2), 69–81, 2024. [DOI]
- [J.2] **Enhancing Sustainability in Hopedale, Newfoundland and Labrador, Through Hybrid Microgrid System Design.**
A. Maliat, S. Kotian, S. Shirinnezhad, et al.
Power Engineering and Engineering Thermophysics, 3(1), 58–76, 2024. [DOI]
- [J.1] **Optimizing Hybrid Energy Systems for Sustainable Development at the Canadian Arctic: A Case Study for Arviat.**
A. Ashouri Vajari, S. Kotian, S. Shirinnezhad, et al.
Journal of Urban Development and Management, 3(3), 150–163, 2024. [DOI]

Research Experience

Independent Researcher

2024 – Present

HCI and AI for Reading, Writing, and Creative Support

- Ongoing research, exploring interactive systems that support literacy and accessibility, combining HCI methods with human-centered AI approaches.
- Built a gesture-based tool enabling early learners to practice spelling by writing letters in the air, combining kinesthetic and visual learning. Currently expanding it into a structured HCI study comparing gesture/control designs to evaluate engagement and learning, with a future goal of adding AI-generated multi-modal feedback.

- Developed a Chrome extension powered by GPT for in-place text transformation on any webpage. Currently exploring how in-situ AI text transformation affects comprehension time and recall compared to traditional copy-paste workflows.

International Research Collaboration

Data Modeling and Policy Engagement in Clean Energy

2023 – 2024
Remote, Canada

- Collaborated with the NLTK Infinity initiative on clean energy supply chains, leading data modeling efforts that informed consultations with Newfoundland and Labrador's Department of Industry, Energy, and Technology.
- Developed predictive models and interactive visualizations to make energy system trade-offs interpretable for policymakers and Indigenous communities.
- Explored how machine learning insights can be communicated to non-technical stakeholders, motivating my interest in explainability, visualization, and accessible interfaces.
- Identified a critical gap: technically sound models often remained inaccessible to those most affected, reinforcing my focus on human-centered AI and decision support.
- This collaboration resulted in multiple peer-reviewed publications on sustainable energy resilience and policy engagement (see Publications).

Undergraduate Research Assistant to Dr. Mohsen Shakiba

Virtual Reality Lab at Jundi Shapur University of Technology

2015 – 2016
Dezful, Iran

- Assisted in research on applying VR technologies to mobile platforms using Unity and Google Cardboard, forming the foundation of my undergraduate capstone project.
- Implemented motion-sensor integration techniques to explore immersive interaction and usability in resource-constrained environments.
- Contributed to experimental design and early testing of VR gameplay mechanics, linking research insights to practical development.

Selected Projects

SceneSketch: AI-Powered Reading Companion

Tools: React, Tailwind, epub.js, Node/Express, OpenAI, Stability AI

October 2025


- Built an eBook reader that turns a highlighted passage into a style-aware scene prompt and AI illustration.
- Reader features: In-browser EPUB viewer with facing-pages layout, jump-to-page & seek bar, persistent bookmarks/highlights/prompts, and an inline Scene Generator
- Research focus: evaluating multimodal augmentation for comprehension—especially for neurodiverse readers (autism/ADHD/dyslexia) and L2 learners—by pairing text with tailored visuals.

AirSpell: AI-Powered Air-Writing for Early Literacy


Tools: React, TensorFlow.js, HTML5 Canvas, JavaScript

July 2025


- Designed a webcam-based app for spelling practice via real-time hand tracking and air-writing.
- Addresses literacy and motor skill development through playful, embodied interaction.
- Supports adaptive feedback, undo/redraw controls, and accessibility for diverse learners, with future plans to add scoring and gamification.

SmartTextEnhancer

Tools: JavaScript, Chrome Extensions, OpenAI API

May 2025


- Built a GPT-3.5-powered Chrome extension for simplifying, translating, and rephrasing text directly on webpages.
- Enhances comprehension and digital literacy by adapting content to reading level, language, and tone.
- Offers customizable reading aids (e.g., dyslexia font, font size), supporting personalized engagement.

Stock Market Prediction Analysis


Tools: Python, Pandas, Scikit-learn, TensorFlow, LSTM, Random Forest

October 2024


- Predicted significant stock price movements using a Random Forest model, achieving an F1 score of 82%.
- Utilized an LSTM network to forecast daily closing prices, reaching an MSE of 0.004 on the test dataset.
- Designed an interpretable dashboard in Streamlit to communicate ML predictions to end-users, emphasizing transparency and usability (*client-facing, not in repo*).

Personal Portfolio Website

Tools: Next.js, React, Tailwind CSS, JavaScript, GitHub Pages

August 2024


- Designed and developed a responsive personal portfolio website showcasing my skills and projects, with a modern, clean, and interactive UI.

- Built with Next.js and React for performance, SEO, and component-based architecture; styled with Tailwind CSS.

GIS - Sensor Data Mapping

June 2024

Tools: R, GIS, ggplot2, Leaflet, dplyr, geosphere



- Conducted spatial interpolation and k-means clustering analysis to identify patterns and anomalies in atmospheric pressure measurements along road segments.
- Developed interactive visualizations to support infrastructure planning and enhance environmental monitoring through geospatial data insights.

Insights into ChatGPT Research

May 2023

Tools: Python, BeautifulSoup, Google Scholar API, Pandas, NLTK, spaCy, LDA



- Analyzed nearly 1,000 research papers on ChatGPT (Google Scholar) using exploratory text analysis and LDA topic modeling, mapping dominant research themes such as applications, education, ethics, and scientific writing.
- Surfaced underexplored areas in the research landscape, framing opportunities for future HCI/AI studies on trust, adoption, and human-AI collaboration.

Social Media Analysis of ChatGPT (Twitter and Reddit)

April 2022

Tools: Python, Pandas, NLTK, spaCy, LDA



- Scraped and analyzed large-scale Twitter and Reddit discussions on ChatGPT, applying exploratory data analysis, word frequency trends, sentiment analysis, and LDA topic modeling to map community perceptions.
- Revealed how public discourse shapes understanding of generative AI tools, raising questions of usability, accessibility, and trust that complement academic studies.

Teaching Experience

DoAssignment.ca – Canadian Tutoring Service

2024 – Present

Tutor — English, Coding & Computer Science

Remote

- Delivered one-on-one tutoring in computer science, mathematics, and related STEM subjects to Canadian K-12 and university students via DoAssignment.ca's online platform.
- Designed curriculum-aligned lessons and adapted teaching strategies to individual learning needs while managing scheduling and communication through their tutor dashboard.

Amoun Computer Institute

2020 – 2023

Computer Science Tutor

Dezful, Iran

- Tutored students in programming (Python, C++), data structures, and algorithms, guiding them through projects and exam preparation.

Bartar Language School

2016 – 2020

English Instructor

Dezful, Iran

- Taught English as a Second Language (ESL) through interactive workshops, fostering student engagement and confidence in communication.

Jundi Shapur University of Technology

Fall 2016

Teaching Assistant — Data Structures and Algorithms

Dezful, Iran

- Assisted in teaching undergraduate students core concepts in algorithms and data structures.
- Graded assignments, midterms, and final exams; held tutorials and provided 1-on-1 academic support.

Work Experience

Upwork

April 2023 – Present

Freelance Data Scientist & Frontend Developer

Remote

- Delivered full-stack solutions in data analytics, frontend development, and UI/UX design for dashboards and interactive web tools.
- Designed clean, responsive interfaces with a focus on usability and accessibility across projects involving business intelligence, GIS, and social media analytics.
- Built custom machine learning models and visualization tools to support client decision-making.

Cafe Bazaar — Iran's Largest Android Marketplace

August 2022 – May 2023

Software Engineer (ML/Data)

Remote

- Designed and maintained machine learning pipelines for analyzing user reviews and app ratings, extracting sentiment and feature-level insights to guide product development.

- Collaborated with product and engineering teams to operationalize insights, improving recommendation systems and customer satisfaction.
- Contributed to scalable backend services, ensuring performance and reliability in high-traffic environments.

Islamic Republic of Iran Railways
Undergraduate Intern

June 2016 - September 2016
Andimkeshk, Iran

- Collaborated on a research initiative to apply VR to industrial training for transportation maintenance simulations.
- Built early prototypes and test scripts; addressed technical and usability issues with cross-disciplinary engineering/design teams.
- Contributed to running pre- & post-skill assessments and analyzed training-time logs to evaluate learning outcomes.
- Findings: 40% lower training costs and +25% skill-assessment scores vs. baseline modules.
- Documented results and iteration notes, establishing a simple metrics pipeline for future training evaluations.

Honors and Awards

Dean's List
Jundi Shapur University of Technology

Multiple Semesters
(Fall 2014, Winter 2015, Fall 2015, Winter 2016)

- Recognized for consistent high academic performance over multiple semesters.
- Demonstrated exceptional academic dedication and achievement, placing in the top 10% of the class.

Annual JSU Programming Contest Winner
Jundi Shapur University of Technology

September 2015

- Secured first place in the annual JSU Programming Contest, specializing in algorithm design and implementation using C++.
- Excelled in solving complex problems under rigorous time constraints, demonstrating advanced proficiency in C++.
- Outperformed other competitors, showcasing superior competitive programming skills.
- Received a certificate and a recognition plaque for outstanding performance.

Service and Community Engagement

Community STEM Outreach
Workshop Facilitator

2023
Dezful, Iran

- Delivered introductory programming and problem-solving workshops for local high school students.
- Promoted early interest in computer science by mentoring participants through hands-on coding activities.

Local Public Library
Volunteer Technology Mentor

2023
Dezful, Iran

- Assisted older adults in developing computer literacy skills, including using email, online resources, and mobile applications.
- Organized small group sessions to promote digital confidence and independence, bridging generational gaps in technology use.

Jundi Shapur University of Technology
Conference Organizer — Student Research Day

2015
Dezful, Iran

- Organized a student-led academic event where undergraduate projects were showcased to faculty and peers.
- Coordinated call for submissions, scheduling, and volunteer teams, encouraging knowledge exchange across departments.