Samaneh Shirinnezhad

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Education

B.Sc. in Computer Engineering *September 2012 - December 2016*

Jundi Shapur University of Technology 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

Find me at: Google Scholar ORCID

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 AirSpell, a React + TensorFlow.js 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 Smart Text Enhancer, a Chrome extension powered by GPT for in-place text transformation on any webpage. Currently exploring how in-situ AI text transformation affect comprehension time and recall compared to traditional copy–paste workflows.

International Research Collaboration [🌐] *2023 – 2024*

Data Modeling and Policy Engagement in Clean Energy 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 *2015 – 2016*

Virtual Reality for Mobile Platforms Jundi Shapur University of Technology, 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

AirSpell: AI-Powered Air-Writing for Early Literacy *July 2025*

Tools: React, TensorFlow.js, HTML5 Canvas, JavaScript [GitHub]

- Designed a React + TensorFlow.js 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/redo controls, and accessibility for diverse learners, with future plans to add scoring and gamification.

Smart Text Enhancer *May 2025*

Tools: JavaScript, Chrome Extensions, OpenAI API [GitHub]

- 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 *October 2024*

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

- 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 *August 2024*

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

- 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 [GitHub]

- 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 [GitHub]

- 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 [GitHub]

- 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 [Web] *2024 – Present*

Tutor — English, Coding & Computer Science Remote, Canada

- 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 Andimeshk, 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 2015*

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 [Web] *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 [Web] *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.

Honors and Awards

Dean's List *Multiple Semesters (Fall 2014, Winter 2015, Fall 2015, Winter 2016)*
Jundi Shapur University of Technology

- 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 *September 2015*
Jundi Shapur University of Technology

- 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 *2023*
Workshop Facilitator 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 *2023*
Volunteer Technology Mentor 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 *2015*
Conference Organizer — Student Research Day 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.