Mahsa Nasri

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PROFESSIONAL SUMMARY

PhD Researcher in Human-Computer Interaction building ML pipelines for behavioral and physiological signal classification in VR/AR, with architectures designed for real-time deployment. Achieved 84% cognitive-load classification accuracy on eye-tracking and GSR data; published at IEEE ISMAR, ACM IDC, and UMAP.

SKILLS

Machine Learning & Deep Learning: TensorFlow, PyTorch, Scikit-learn, Keras, XGBoost.
Data Science & Analysis: Pandas, NumPy, SciPy, small-N modeling, statistical modeling, signal processing, feature engineering.
Programming Languages: Python (primary), C#, C++.
3D/XR: Unity Engine, OpenXR, VRTK, XR Interaction Toolkit, Oculus SDK.
GenAI/Agents: Agentic pipelines, LLM function calling and & tool use, agent orchestration, Stable Diffusion, Claude.
Version Control: GitHub, Plastic SCM.
Infrastructure: Northeastern Research Computing (HPC/GPU clusters)
Research Methods: Experimental Design, mixed-methods evaluation, IRB protocols, statistical analysis.

EDUCATION

Ph.D. in Interdisciplinary Design and Media 01/2022 – 08/2027 | Northeastern University, Boston, MA
Research Assistant on NSF project and award #2302838
M.A. in Animation 09/2016 – 02/2020 | Iran University of Art, Tehran, Iran
B.Sc. in Electrical Engineering 09/2011 – 09/2015 | Isfahan University of Technology, Isfahan, Iran

EXPERIENCE

XR Research Assistant
GhostLab, Northeastern University 01/2022 – Present | Boston, MA

XERT Advanced Manufacturing Training:

- Engineered end-to-end ML pipeline processing 220Hz eye-tracking streams (pupil dilation, fixation patterns) through feature extraction, training, achieving 84% cognitive load classification accuracy
- Benchmarked multiple architectures (MLP, Random Forest, SVM) using cross-validation; optimized Random Forest hyperparameters, reducing false positive rate by 23%.
- Designed data collection framework for 40-participant study capturing synchronized physiological signals, performance metrics, and behavioral annotations.
- Published production-ready system at IEEE ISMAR 2024, demonstrating a scalable approach to adaptive VR training.

VR Escape Room – Cognitive Load Modeling Study:

- Developed deep learning models (CNN for time-series attention patterns, XGBoost for tabular features, MLP baseline) to predict user performance with N=42 participants.
- Implemented a custom CNN architecture for sequential gaze pattern recognition, achieving 78% classification accuracy on problem-solving success.

ArticuMotion – Gamified Speech Therapy Game:

- Guided participatory design sessions with speech-language pathologists and computer vision engineers to design a game for children with speech disorders.
- Leveraged generative AI (DALL-E, stable diffusion) for rapid asset creation.
- Conducted a within-subjects study with preschoolers.
- Published research at ACM IDC 2024, demonstrating a gamification approach validated with the target population.

In Awe – VR Emotional Design Experiment:

- Designed and implemented control and awe-inducing VR environments.
- Conducted between-subjects study (N=20) with mixed methods (eye tracking, GSR, NASA-TLX, and creativity scales).
- Found that feeling of awe significantly boosted creativity and lowered workload perception.

Visiting Researcher

CHAI Lab, Northeastern University, Boston, MA *05/2026 – 08/2026*

- Co-designed an LLM-based conversational agent for older-adult companionship and led the accompanying user study.

VR/AR Developer and Researcher 01/2020 – 09/2021 | Isfahan, Iran

UICVGame

VR Rehabilitation for Women with Multiple Sclerosis:

- Designed and implemented a Bluetooth-enabled VR cycling app integrating real-world bike telemetry.
- Guided user studies (N=30), evaluated engagement and accessibility via behavioral metrics, structured interviews, and qualitative analysis.

Empathy in VR Counseling Simulations:

- Created haptic-integrated VR prototypes to probe empathy and emotional response; ran iterative usability studies and interviews (N=20).
- Surfaced key usability barriers and prioritized design improvements to enhance accessibility and user satisfaction.

CREATIVE WORK

Tangible Intangible – an Emotionally Intelligent Art Therapy in MR:

- Built a real-time emotion detection system using computer vision for pupil dilation analysis and physiological signal processing.
- Integrated generative AI (GPT-4, DALL-E) for dynamic content adaptation based on classified arousal states.

Four Hands VR – Embodiment & Illusion Study:

- Developed an artistic VR experience exploring virtual embodiment and perception through iterative design.
- Showcased in a group exhibition at MIT Museum, gathering qualitative feedback on virtual embodiment.

SELECTED PUBLICATION

1. Rahman, H., **Nasri, M.,** Vaidya, M., Vafafar, M., Chin, J., & Desai, S. (2026). " MeBo Leaves a Piece of You Behind": Designing a Relational Voice-Based Memory Companion for Older Adults. *arXiv preprint arXiv:2609.24706*.
2. **Nasri, M,** et al. "Tangible Intangibles: Exploring Embodied Emotion Mixed Reality for Art Therapy." *Proceedings of the Twentieth International Conference on Tangible, Embedded, and Embodied Interaction*. 2026.
3. **Nasri, M.** (2025, June). Towards Intelligent VR Training: A Physiological Adaptation Framework for Cognitive Load and Stress Detection. In *Proceedings of the 33rd ACM Conference on User Modeling, Adaptation and Personalization* (pp. 419-423).
4. **Nasri, M**., Kosa, M., Chukoskie, L., Moghaddam, M., & Harteveld, C. (2024, October). Exploring eye tracking to detect cognitive load in complex virtual reality training. In *2024 IEEE International Symposium on Mixed and Augmented Reality Adjunct (ISMAR-Adjunct)* (pp. 51-54). IEEE.
5. **Nasri, M**., Narayan, U., Sonbudak, M. F., Simonson, A., Chiu, M., Donati, J., ... & Harteveld, C. (2024, October). Designing a Virtual Reality Training Apprenticeship for Cold Spray Advanced Manufacturing. In 2024 IEEE International Symposium on Mixed and Augmented Reality Adjunct (ISMAR-Adjunct) (pp. 541-544). IEEE.
6. Alsebayel, G., **Nasri, M**., Myers, C. P., Troiano, G. M., Hatamimajoumerd, E., Ostadabbas, S., ... & Harteveld, C. (2024, June). Articumotion: Towards assessing motor speech disorders via gamification. In *Proceedings of the 23rd Annual ACM Interaction Design and Children Conference* (pp. 232-247).

Volunteer

Associate Chair for Poster Track ACM CHI 2025 Boston, MA

MIT Reality Hack Boston, MA

Mentor (2024), Judge (2025, 2026)

Conference Volunteer Boston, MA

IEEE Conference on Games 2023, ISAGA 2022.