

ZAHRA KHODAKARAMI

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SUMMARY

An inspiring entrepreneur PhD candidate in medical image processing and deep learning models. Independent and creative problem solver who leverages data science, NLP and computer vision AI models to find an optimized solution for real-world problems.

EDUCATION

Ph.D. in Bioengineering, University of Pennsylvania (GPA: 3.97/4)

Aug 2023 - Present

Advisor: Dr. Paul Yushkevich

Research: Medical Image Processing, Image Segmentation and Registration, Generative AI (Gen AI), Machine Learning (ML)

B.Sc. in Software Engineering, University of Isfahan (GPA: 3.5/4)

Sep 2014 - Jun 2019

RESEARCH EXPERIENCE

- **Quantifying Myelin Loss in Histology and Linking it to White Matter Hyperintensities in MRI** *Jun 2024 - Present*
 - Develop **the first** *in vivo* neuroimaging biomarker for diagnosis and targeted treatment of myelin loss.
 - Register *in vivo* flair, *ex vivo* T2 MRI, and histology images into the same space by using greedy registration, and rotation and scaling invariant template matching.
 - replicate neuro-pathologists' myelin loss rating by 90% accuracy.
 - Assess white matter hyperintensities on matched *in vivo* and *ex vivo* brain MRIs. presented in **Alzheimer's association international conference (AAIC) 2025**.
- **Longitudinal Neuroimaging Abnormality Tracker** [*This product is being developed*] *Jan 2025 - Present*
 - Build voxel-level MRI difference mask tool that enables clinicians to monitor abnormalities such as cerebral amyloid angiopathy.
 - Generate reports with volumetric measurements by using image processing and LLM APIs.
 - Complete primary market research for angel investors in "Disciplined Entrepreneurship" format.
- **Alzheimer's Disease (AD) Subtype Discovery** [*under review*] *May 2025 - Jul 2025*
 - Lead a data analysis in a 144-autopsy Cohort; clustering neurofibrillary-tangle densities and measuring cortex:hippocampus ratios to identify a novel "idiotypic-susceptible" subtype.
 - link the findings to corticobasal syndrome and MAPT/APOE genotypes.
 - Improve the accuracy of AD categorization by 20%.

SELECTED PUBLICATIONS

- V. Lohner, ..., **Z. Khodakarami**, et al. "Machine learning applications in vascular neuroimaging for the diagnosis and prognosis of cognitive impairment and dementia: a systematic review and meta-analysis" **Alzheimer's Research & Therapy** 2025
- C. Athalye, ..., **Z. Khodakarami**, et al. "Operationalizing postmortem pathology-MRI association studies in Alzheimer's disease and related disorders with MRI-guided histology sampling" **Acta Neuropathologica Comm.** 2025
- O. Manzari, ..., **Z. Khodakarami**, et al., "DenUnet: enhancing dental image segmentation through edge and body fusion" **Multi-media Tools and Applications** 2024

WORK EXPERIENCE

- **Deputy director for Inter-school Partnership Fund (IPF)** within the Graduate and Professional Student Assembly at the University of Pennsylvania *Aug 2024 - Present*
 - Screen, ensure eligibility, and approve IPF applications. Also coordinate grant payouts to qualifying schools.
- **Co-Founder and Product Manager** — BlueBee — A startup for providing a real-time, ML-powered product recommendation in mobile marketing of online shops' campaigns as a SaaS offering. *Feb 2022 - Aug 2023*
 - Optimize click-through rate in the suggested bundles and products in mobile marketing by **25% for ≈ 300K users**
 - Plan product development and acquire customers road-map in addition to do market research
 - Pitch and **raise fund** in pre-seed stage for developing MVP from Diginext Co. (70M Iranian Toman)
- **Founder and Manager** — BZContent — An online service provider for boosting online visibility and conversions through data-driven web search, and social media strategies. *Aug 2019 - jun 2022*
 - Lead and manage **a team of 12** for delivering website development, SEO, Content creation and related services
 - Generate **10 times** of revenue in the last year compared to the first year.
 - Manage 50+ projects, with **≈ 70% client retention**.

SPECIAL SKILLS AND TOOLS

- **Coding** : Python, PyTorch, TensorFlow, Hugging Face Transformers, Java, C++, SQL, MATLAB, Docker, Git, CUDA, Bash, R
- **Tools**: c3d, Freesurfer, ITK-Snap, Fiji (ImageJ), NLTK, scikit-learn, Pandas, OpenCv, PIL, nltk, MONAI
- **Cloud and APIs**: Amazon Web Services (AWS), Google Cloud, Vertex AI ,AI Foundry, AI Studio, Kubernetes, OpenAI, Anthropic Claude, Google Gemini, Meta Llama

SELECTED HONORS & AWARDS

- Selected participant & travel grant awardee in Frameshift Immuno-Engineering Training & Case Competition (Johns Hopkins) *2024*
- The Social Impact winner in "Generative AI Hackathon 2024" (University of Pennsylvania) *2024*