ALIREZA HASHEMI

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SUMMARY

AI & Machine Learning Engineer with 3+ years of experience in computer vision, natural language processing, and applied deep learning. Skilled in developing scalable, high-performance models for real-time detection, biomedical imaging, and industrial automation, with expertise in transfer learning, fine-tuning, and model optimization. Experienced across diverse data modalities—images, video, text, and biosignals—bringing research-driven methods into practical, production-ready solutions. Familiar with brain–computer interface research, bridging technical rigor with innovative applications to advance AI systems that are both impactful and ethically grounded.

WORK EXPERIENCE

AI Engineer
Hami System Sharif
Jan | 2025 – Present

- Designed and deployed NLP and Computer Vision solutions, including NER, sentiment analysis, OCR, ASR, and LLM-RAG systems.
- Optimized end-to-end deep learning pipelines and integrated models into scalable production environments.
- Bridged research and engineering by translating state-of-the-art methods into practical AI applications.

Neuroimaging Researcher
Mar | 2024 – 2025
SOAI

- Conducted research on visual cortex and EEG-based decoding to reconstruct visual information.
- Developed novel algorithms to transform EEG signals into image representations, advancing brain–computer interface research.

Computer Vision Engineer
Mar | 2023 – 2024
Vida Medical

- Built deep learning models for breast cancer detection and advanced medical image analysis.
- Designed segmentation and classification pipelines to support clinical decision-making in healthcare.

AI & ML Intern
Feb | 2021 – 2022
Smartech

- Developed human pose estimation and real-time vision systems for applied AI projects.
- Implemented object detection and tracking pipelines optimized for real-time environments.

EDUCATION

B.Sc. in Software Engineering
Sep | 2019 – 2023

Mulla Sadra Technical Vocational University, Iran

- Relevant coursework: Machine Learning, Data Structures & Algorithms, Databases, Python Programming

TECHNICAL SKILLS

- **Programming & Data:** Python, NumPy, Pandas, Scikit-learn, MLflow
- **Deep Learning & Computer Vision:** PyTorch, Torchvision, OpenCV, Albumentations, Ultralytics YOLO, MediaPipe
- **Natural Language Processing & LLMs:** Hugging Face Transformers, Ollama, LLM-based tools
- **Deployment & MLOps:** FastAPI, Docker, Git, CI/CD pipelines
- **Visualization & Analysis:** Matplotlib, Seaborn, Plotly
- **Research Interests:** AI ethics, biomedical imaging, brain–computer interfaces, neuroimaging

PROJECTS

LLM-RAG Knowledge Retrieval System

- Built a fully customized NLP pipeline using local large language models, retrieval-augmented generation (RAG), and vector databases for domain-specific document search.

Persian OCR Pipeline

- Developed a complete Persian OCR system using DoTS-OCR and PaddleOCR, including API deployment for scalable text recognition.

Persian Sentiment Analysis

- Implemented classification models (BERT, DistilBERT, ParsBERT) to analyze Persian text into three sentiment categories with high accuracy.

Brain Tumor Segmentation & Classification

- Applied U-Net, ResNet, DenseNet, VGG, and ViT for tumor detection and segmentation in MRI scans, achieving high diagnostic accuracy.

Breast Cancer Histopathology Classification

- Trained ResNeXt with hybrid loss functions and attention modules (CBAM, SE blocks) on large-scale histopathology data, reaching 99.37% accuracy.

Brain Cell Slice Segmentation (Microscopy Imaging)

- Designed patch-based semantic segmentation models for fluorescence microscopy images, enabling precise cell structure analysis.

Electron Particle Segmentation with YOLO

- Adapted YOLO architectures for particle detection and segmentation in medical imaging, improving diagnostic support systems.

Real-Time Object Detection & Segmentation

- Deployed YOLO-series models for live object detection and segmentation tasks in real-world environments.

Electron Particle Segmentation with YOLO

- Adapted YOLO architectures for particle detection and segmentation in medical imaging, improving diagnostic support systems.

Human Pose Estimation for Fitness Applications

- Built a Mediapipe + Streamlit pipeline to track human poses and classify exercise movements for fitness and clothing applications.

EEG-Based Motor Imagery & Hand Movement Recognition

- Developed time-series models (CNN, RNN, LSTM, Transformers, Spiking Neural Nets) for EEG-based classification, advancing brain–computer interface research.

CERTIFICATES

Smartech AI Bootcamp

- Completed a 120-hour intensive program covering Python, machine learning, deep learning, computer vision, NLP, and image processing & Text Processing.

Deep Learning with PyTorch – DataCamp

- Hands-on training in neural networks, backpropagation, and model building using PyTorch for real-world applications.

Computer Vision with PyTorch – DataCamp

- Practical experience with convolutional networks and PyTorch for image classification, detection, and augmentation tasks.

Generative AI Concepts – DataCamp

- Explored core principles of generative AI, including diffusion models, transformers, and creative AI applications.

Machine Learning Fundamentals – DataCamp

- Studied supervised/unsupervised learning, evaluation metrics, and key ML workflows for applied problem-solving.

Understanding Artificial Intelligence – DataCamp

- Foundational overview of AI concepts, ethical considerations, and applications across multiple domains.