DORNA SABET

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Computer vision and machine learning researcher with **4+ years of experience** developing and validating high-performance models on complex, **real-world datasets** with hands-on experience across detection, segmentation, and facial-expression analysis pipelines and camera calibration. Skilled in **Python, C++, OpenCV, and PyTorch**. Demonstrated ability to design, implement, and evaluate advanced deep-learning models for image and video understanding using 2D/3D data.

EDUCATION

University of Alberta**,** Edmonton, AB, Canada (Graduate to be) Sep 2023-Jan 2026
Master's Engineering (GPA: 3.9/4.0)

Khajeh Nasir University of Technology, Tehran 2018-2022
Bachelor of Mechanical Engineering (GPA: 3.78/4.0)

SKILLS

Skills: Python, C++, MATLAB, Git, OpenCV, PyTorch, TensorFlow, Keras, Scikit-learn, CUDA, Opensim, Catia

PROFESSIONAL EXPERIENCE

IDEA Lab, Edmonton, Canada Sep 2023-2025
Graduate Research Assistant
Deep Learning–Based Markerless Motion Capture for Quantifying Balance in Rehabilitation.

- Evaluated the accuracy, reliability, and clinical validity of multiple **markerless pose-estimation models** (MediaPipe, DeepLabCut, OpenPose) for balance-related rehabilitation tasks.
- Collected and curated a multi-view motion dataset from 30 participants with diverse anthropometrics to support training and benchmarking of markerless **pose-tracking models**.
- Developed and refined **multi-view** camera **calibration** pipelines, leveraging checkerboard-based and feature-based methods to enable accurate **3D reconstruction**.
- Making a pipeline for benchmarking markerless motion-capture outputs against gold-standard systems (Vicon) using established rehabilitation metrics and statistical validation **across 90+ hours of recorded data**.
- Investigated **LSTM-based sequence models** for anatomical landmark estimation, training temporal models to infer 3D body landmarks from image sequences.

SYMO startup, Tehran 2021– 2022
AI Researcher

- Designed and implemented computer vision models for clothing detection and segmentation, supporting virtual try-on and online fitting-room applications.
- Implemented **object detection** and **segmentation** pipelines using YOLO and Fast R-CNN, incorporating custom post-processing workflows to improve accuracy and robustness on real-world datasets.
- Fine-tuned **image classification** models for automated categorization of men's clothing products.
- Led dataset preparation and annotation strategies and built evaluation pipelines on a dataset of 5,000+ images, ensuring data quality and reliable model performance.

Prochista Mechatronics, Tehran 2019
Programming Intern

- Programmed and integrated behavioural modules for SoftBank's Pepper robot, with a focus on human–robot interaction workflows.
- Assessed face detection models deployed on SoftBank robotic platforms and analyzed real-time performance.
- Gained hands-on experience in robotics software development, computer vision integration, and robot behaviour programming within real-world robotic systems.

PROJECTS

Smart-Derm: Skin Lesion Detection System
- Investigated CNN-based classification models for early identification of skin abnormalities.
- Developed an Android mobile application integrating the trained models to enable on-device lesion detection and classification.

KinArm Simulator Using YOLO
- Built a low-cost KinArm robot simulator using YOLO **object detection and OpenCV**.
- Created interactive rehabilitation-style games controlled with tracked hand movements.

Deep Vision Models for Automatic Emotion and Arousal Detection. (BSc Thesis)
- Implemented and evaluated convolutional neural networks (VGG, ResNet) for facial feature learning and affect/arousal prediction.
- Applied GAN-based data augmentation to increase dataset diversity and improve model generalization under limited-data conditions.

Deep-utils Python Library
- Partnered on deep-utils, a Python library for deep learning research, with a focus on visualizing feature maps and intermediate representations during model training.

Sleep Stage Classification Using EEG Signals with Neural Networks.
- Analyzed deep learning models to classify four sleep stages from EEG signal.
- Examined CNN-based and Transformer-based architectures for temporal feature extraction.
- Performed signal preprocessing to assess classification performance across sleep stages.

Steel Defect Segmentation
- Compared the performance of U-Net and FCN-8 architectures for the **segmentation** of steel defects.

QUALIFICATIONS

Awards: *Alberta Innovates Scholarship*, University of Alberta Graduate Recruitment Scholarship

Activities and Training: Mentoring multiple undergrad students, NatIgnite Hackathon, Leadership of self and others Workshop, Lab2Market Discover Course (Entrepreneurship)

Language: Fluent in English, Persian- French (A1)

PUBLICATIONS & PRESENTATIONS

- D. Nourbakhsh Sabet, M. R. Zarifi, J. Khoramdel, Y. Borhani, E. Najafi," An Automated Visual Defect Segmentation for Flat Steel Surface Using Deep Neural Networks," International Conference on Computer and Knowledge Engineering (ICCKE 2022)
- D. Nourbakhsh Sabet, H. Tamimi, A. H. Vette, and M. Nazarahari, "*Inverse Dynamics Meets Markerless Motion Capture during Standing: Concurrent Validation of Center of Mass and Center of Pressure Estimations*," Ann Biomed Eng, 2025 (under review).
- D. Nourbakhsh Sabet, H. Tamimi, A. H. Vette, and M. Nazarahari, "From Cameras to Center of Pressure: Concurrent Validation of Markerless Balance Metrics Against Force Plate Measurements. Ready for submission, 2026.
- Participated and talked in conferences: Institute of Smart Augmentative and Restorative Technologies and Health Innovations (iSMART) Talk, Biomedical Engineering Day, 25th Annual Alberta Biomedical Engineering Conference, and Faculty of Engineering Graduate Research Symposium.