Emad Ghaleh Noei, Ph.D

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Portfolio: https://emadghalenoei.github.io | Live app: https://flyovermap3d.com

SUMMARY

Machine Learning Scientist with a Ph.D. and 7+ years building deep-learning and Bayesian models for image, geospatial, and 3D data. Strengths in computer vision, segmentation, experiment design, and production ML pipelines on Google Cloud with Docker and FastAPI.

SKILLS

- Programming: Python, C++, Cython, Julia, R
- Deep Learning: PyTorch, TensorFlow, Keras, Scikit-learn, Detectron2, CUDA
- Vision & 3D: object detection, semantic segmentation, anomaly detection, LiDAR point clouds
- Research: experiment design, benchmarking, statistical validation, technical documentation
- Cloud/DevOps: Docker, Google Cloud, AWS, FastAPI, Firestore, Earth Engine
- Data Stack: PDAL, GDAL/OGR, GeoPandas, Rasterio, PostGIS, feature engineering

EXPERIENCE

Spatial Data Analytics Inc. | Senior Innovation Developer | May 2022 – Present

- Build deep-learning models for image segmentation and object detection on large geospatial datasets.
- Benchmark 3D point-cloud classification pipelines using PointNet++, PointConv, and random forests.
- Develop preprocessing workflows for tiling, normalization, and feature extraction; evaluate models with robust metrics.
- Containerize training and inference workflows with Docker and support production integration with engineering teams.
- Added LiDAR processing tools to Solv3d in Python and JavaScript.

Flyover Map 3D | Founder & ML/Software Developer | 2025 – Present

- Built a web app that turns user routes into 3D flyover videos through automated data processing, rendering, and delivery.
- Designed scalable backend workflows on Cloud Run, GCS, Firestore, and FastAPI, including billing and job tracking.
- Implemented DEM/RGB preprocessing, reprojection, and 3D mesh generation pipelines for large geospatial datasets.
- Improved route processing, rendering quality, and cloud-job monitoring through rapid prototyping and iteration.
- Shipped multiple texture modes and delivery workflows to expand product capability.
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The University of Calgary, Geomatics Engineering | Postdoctoral Researcher | Feb 2022 – Feb 2023
Developed ML models for subsurface structure detection on noisy scientific datasets.

The University of Calgary, Geomatics Engineering | Research Assistant | Sep 2017 – Jan 2022
Built Bayesian and ML models for inverse problems, uncertainty estimation, and anomaly-focused interpretation; published peer-reviewed research.

PROJECTS

- Image Segmentation & Object Detection (2022 – Present) – PyTorch and Detectron2 for real-world imagery.
- 3D Point-Cloud Classification (2022 – Present) – PointNet++, PointConv, and random forests for airborne LiDAR.
- Production Geospatial ML Pipelines (2022 – Present) – Tiling, normalization, feature engineering, and scalable inference.
- Bayesian & Anomaly Modeling (2017 – 2022) – Probabilistic models for subsurface detection and uncertainty estimation.
- Computer Vision: Optical Flow (2012 – 2016) – Motion analysis in sequential satellite imagery.
- Geothermal Exploration (2021 – 2022) – ML and Bayesian algorithms for density modeling and visualization.

PUBLICATIONS

Trans-dimensional gravity and magnetic joint inversion for 3-D earth models, Ghalenoei et al., 2022 (GJI).
Gravity and magnetic joint inversion for basement and salt structures with the reversible-jump algorithm, Ghalenoei et al., 2021 (GJI).

EDUCATION

University of Calgary, Ph.D. in Geomatics Engineering, 2017 – 2021 (GPA: 3.9/4)
University of Tehran, M.S. in Geospatial Engineering, 2012 – 2014 (GPA: 3.85/4)

HONORS & ACHIEVEMENTS

- Alberta Graduate Excellence Scholarship, $15,000 (2021)
- Alberta Graduate Excellence Scholarship, $15,000 (2019)
- Helmut Moritz Graduate Scholarship, $3,400 (2019)
- 3rd Place at the Geomathon Competition (2019)
- External Awards: Miscellaneous $1,500 (2019)
- Teaching Award (2018)