Kshitij Nikhal

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Summary

AI/ML scientist specializing in computer vision, unsupervised learning, foundational models, and cross-modal recognition, with proven industry success at Google X, TomTom Maps, and Alpha Grid. 15+ publications, 3+ patents, and contributions to IARPA and U.S. Army projects on deployable ML for critical scenarios.

Education

University of Nebraska-Lincoln May 2021 - March 2024

Ph.D. AI/Computer Vision (Advisor: Dr Benjamin Riggan) *Lincoln, NE, USA*

- Authored 2 journal & 8 conference papers at notable venues such as CVPR, WACV, and others.
- Research: unsupervised learning, foundational models, attention models, computer vision, domain adaptation, cross-modal learning, person/face recognition, biometrics, efficient inference.

University of Nebraska-Lincoln Jan 2020 - May 2021

M.S. AI/Computer Vision (Advisor: Dr Benjamin Riggan) *Lincoln, NE, USA*

- GPA: 4.0. Authored 1 conference paper at WACV21.
- Thesis: Learning Discriminative and Efficient Attention for Person Re-Identification Using Agglomerative Clustering Frameworks

University of Pune May 2013 - May 2017

B.E. Computer Science *Pune, MH, India*

- Grade: First Class with Distinction. Authored 1 conference paper at IntelliSys 2017

Experience

Alpha Grid Feb 2024 - Present

Founding Machine Learning Scientist *Palo Alto, CA, USA*

- Contributions: Leading data and ML efforts to build the intelligence layer for EV charging and accelerate clean infrastructure deployment. Invented EV AutoPilot-optimizing EV charger pricing and energy management—and developed LLMs for amenity search, demand forecasting, and grid-stability enhancement. (One Patent Filed).
- Impact: Increase up to 25% in gross revenue while improving grid stability in the US.

University of Nebraska-Lincoln Jan 2020 – Dec 2023

Research Assistant *Lincoln, NE, USA*

- Part of **IARPA BRIAR** program to develop whole body recognition using computer vision in challenging scenarios (500m range, atmospheric turbulence, aerial sensors, etc.).
- Part of **U.S. Army/UMD's ArtIAMAS** (AI and Autonomy for Multi-Agent Systems) program for developing efficient, dynamic, and deployable ML models, ensuring reliability in extreme environments.

Google X (Moonshot Factory) Aug 2022 – Dec 2022

AI Resident *Mountain View, CA, USA*

- Contributions: Photogrammetry on aerial oblique imagery to infer key electrical properties of grid assets.
- Impact: Capability of a fine-detailed map of the electric grid (One Patent).

Google X (Moonshot Factory) May 2021 – Aug 2021

AI Resident *Mountain View, CA, USA*

- Contributions: Developed a few-shot learning foundational model to rapidly identify new electrical grid defects using StreetView-like imagery.
- Impact: Substantial cost & time savings for utility companies in the US by eliminating manual work (One Patent).

TomTom Maps Jan 2017 – Dec 2019

Software Engineer *Pune, MH, India*

- Contributions: End-to-end ML Pipeline for map feature extraction (e.g., roads, building footprints, etc,.).
- Impact: 100x time reduction of manual cartography hours.
- Contributions: Developed Graph & ML models with multi-modal data (e.g., GPS, multi-spectral imagery) to fix map inconsistencies.
- Impact: 2x more accurate, real-time map.

Patents

[1] Meta-learning for detecting object anomaly from images (Google X)
[2] Inferring Electrical Properties using Photogrammetry (Google X)
[3] Rendering System for Post-Construction Visualization of Electric Vehicle Supply Equipment (Alpha Grid)

Publications

1. **Nikhal, K.** et al. Discovering EV Charging Site Archetypes Through Few Shot Forecasting: The First U.S.-Wide Study. *NeurIPS 2025 Workshop on Tackling Climate Change with Machine Learning*

2. **Nikhal, K.**, Fondje, C. N., & Riggan, B. S. Cross-Spectral Attention for Unsupervised RGB-IR Face Verification and Person Re-identification. *IEEE Access 2025*

3. **Nikhal, K.** Weakly Supervised Attention-Based Recognition Under Spectral, Turbulence, and Resource Variations. Diss. The University of Nebraska-Lincoln, 2024.

4. **Nikhal, K.**, Ma, Y., Bhattacharyya, S. S., & Riggan, B. S. HashReID: Dynamic Network with Binary Codes for Efficient Person Re-identification. *WACV 2024*

5. **Nikhal, K.**, Uzuegbunam, N., Kennedy, B., & Riggan, B. S. Mitigating Catastrophic Interference Using Unsupervised Multi-Part Attention for RGB-IR Face Recognition. *CVPRW 2023*

6. **Nikhal, K.**, & Riggan, B. S. Weakly Supervised Face and Whole Body Recognition in Turbulent Environments. *IJCB 2023*

7. Fondje, C. N., **Nikhal, K.**, et al. HBRC-500: A Long Range Recognition Benchmark Dataset using Face and Whole-body Imagery. *IJCB 2023*

8. Karl, R., **Nikhal, K.**, & Riggan, B. S. Enhanced Privacy-enabled Face Recognition using k-Identity Optimization. *In Review*

9. Ma, Y., **Nikhal, K.**, Bhattacharyya, S. S., & Riggan, B. S. Dynamically Reconfigurable Perception using Dataflow Parameterization of Channel Attention. *Invited Asilomar 2023*

10. **Nikhal, K.**, & Riggan, B. S. Multi-context grouped attention for unsupervised person re-identification. *TBIOM 2022*

11. **Nikhal, K.** Learning Discriminative and Efficient Attention for Person Re-Identification Using Agglomerative Clustering Frameworks. *Masters Thesis*

12. **Nikhal, K.**, & Riggan, B. S. Unsupervised attention based instance discriminative learning for person re-identification. *WACV 2021*

13. Hamblin, J., **Nikhal, K.**, & Riggan, B. S. Understanding Cross Domain Presentation Attack Detection for Visible Face Recognition. *FG 2021*

14. Palnak, F., **Nikhal, K.**, Verma, P., Panchani, R., & Rohankar, S. MAGEC: machine assisted geometry extraction and creation. *ICMV 2019*

15. Gite, B., **Nikhal, K.**, & Palnak, F. Evaluating facial expressions in real time. *IntelliSys 2017*

Other Projects

Super Resolution on Satellite Imagery | *Generative Networks*

- Developed capability to improve resolution and uniformity of aerial imagery across different imagery providers for map feature segmentation using generative networks (GANs) and image-to-image translation.

Indoor Position using Keypoint Detection | *Android Development, Keypoint Extraction*

- Developed a mobile application for indoor navigation using known reference objects in an office environment.

Happy Moments on TomTom Action Camera | *Support Vector Machines, Face & Expression Recognition*

- Developed capability to automatically detect happy (smiling) moments to create a personalized slideshow of 'Happy Moments' in the TomTom action camera app.

VR-Cartographers | *AR/VR, Oculus, Mapping*

- Built an application for the Oculus Rift platform, allowing cartographers to view & interact with TomTom's street level imagery data, enabling them to precisely create map features.

Street & Business Name Extraction From Street Imagery | *Text Extraction, Object/Sign Detection*

- Extracting textual information from street-view imagery to automate map changes updates.

Technical Skills

Frameworks/Tools: PyTorch, TensorFlow, Keras, React, Terraform, gRPC, Spanner, Beam.
AI/ML: generative networks, foundational models, few-shot learning, clustering, unsupervised learning, transformers, recurrent networks, object detection, optical flow, depth/disparity estimation, segmentation, attention models, large language models (LLM), tracking, mapping, localization, photogrammetry.
Libraries: numpy, pandas, scikit, opencv, matplotlib, spacy

Accolades

IJCB Doctoral Consortium 2023
NSF Student Travel Grant 2023
Milton Mohr Fellowship 2022
Winner of TomTom Hackathon 2018
Winner of TomTom Innovation Day 2018
Winner of TomTom Special Jury Award 2017
Winner of TomTom Hackathon 2017