KSHITIJ NIKHAL

AI Researcher

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EDUCATION

Ph.D. Electrical Engineering **University of Nebraska-Lincoln**
2023 (Expected) Lincoln, NE, USA

- Key Question: *"How to distill discriminative information across domains with minimal or no supervision, while mitigating the impact of poor generalization?"* for biometric applications.
- Minor: Computer Science. PhD Advisor: Dr. Benjamin S. Riggan.

M.S. Electrical Engineering **University of Nebraska-Lincoln**
2021 Lincoln, NE, USA

- GPA: 4.0. Research focus: Computer Vision & Unsupervised Learning.
- Master's Thesis: Learning Discriminative and Efficient Attention for Person Re-Identification Using Agglomerative Clustering Frameworks.

B.E. Computer Science **University of Pune**
2017 Pune, MH, India

- Grade: First class with Distinction.
- Bachelor's Thesis: Evaluating Facial Expressions in Real Time.

EXPERIENCE

Research Assistant **University of Nebraska-Lincoln**
Jan 2020 – Present Lincoln, NE, USA

Two Focus Areas: 1. Accurate Recognition 2. Efficient Recognition.

1. **Focus:** Accurate biometric intelligence in challenging scenarios (500m range, atmospheric turbulence, aerial sensors, etc.)
   Supported by: IARPA BRIAR (Biometric Recognition and Identification at Altitude and Range) Program.

2. **Focus:** Efficient, Dynamic and Deployable biometric models, ensuring reliability in extreme environments.
   Supported by: U.S. Army Research Lab/UMD's ArtIAMAS (AI and Autonomy for Multi-Agent Systems) Program.

AI Resident **Google X, the Moonshot Factory**
May 2021 – Aug 2021, Aug 2022 – Dec 2022 Mountain View, CA, USA

Two AI Residencies (2021 & 2022):

1. **Contributions:** Few-shot learning vision model to identify defects on the electrical grid using StreetView-like imagery.
   Impact: Substantial cost/time savings by eliminating manual work.

2. **Contributions:** Photogrammetry on oblique aerial imagery to infer key electrical properties of power poles.
   Impact: Capability of a fine-detailed map of the electric grid.

Software Engineer **TomTom Maps**
Jan 2017 – Dec 2019 Pune, MH, India

1. **Contributions:** End-to-end ML Pipeline for map feature extraction (e.g., roads, building footprints, etc,.).
   Impact: 100x time reduction of manual cartography hours.

2. **Contributions:** Developing Graph & ML models with multi-modal data (e.g., GPS, multi-spectral imagery) to fix map inconsistencies.
   Impact: 2x more accurate, real-time map.

SUMMARY

6+ years of research experience:
1. Concept Development at TomTom
2. Research Assistantship at UNL.
3. AI Research at Google X.

PhD Focus Areas: Unsupervised, Cross-Domain Recognition
Funded by two "high-risk /high-payoff" programs:
1. US Intelligence's IARPA BRIAR.
2. US Army/UMD's ArtIAMAS.

Skills: Unsupervised Learning, Computer Vision, Optimization, Domain Adaptation, Python, C++, PyTorch, TensorFlow, OpenCV.

PATENTS

Meta-learning for detecting object anomaly from images.

Inferring Electrical Properties using Photogrammetry (Pending)

RECENT PUBLICATIONS

HashReID: Dynamic Network with Binary Codes for Efficient Person ReID
Under Review

Weakly Supervised Face and Whole Body Recognition in Turbulent Environments
Under Review

Cross-Spectral Attention for Unsupervised RGB-IR Face Verification and Person Re-identification
Under Review at TIPS Journal 2023

Mitigating Catastrophic Interference using Unsupervised Multi-Part Attention for RGB-IR Face Recognition
CVPRW 2023

Multi-Context Grouped Attention for Unsupervised Person Re-Identification
TBIOM Journal 2023

Unsupervised Attention Based Instance Discriminative Learning for Person Re-Identification
WACV 2021

MAGEC: Machine Assisted Geometry Extraction and Creation
ICMV 2019