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Mohammad-Amin Arab

Professional Summary

Deep Learning and Computer Vision researcher with 7+ years of hands-on experience developing image authentication, generative modeling, and multimedia-forensics systems. Expert in designing and optimizing neural networks (CNNs, ViTs, GANs, INNs), building end-to-end ML pipelines, and conducting large-scale experimentation. Seeking roles in Machine Learning Engineering, Applied Research, or Computer Vision.

Technical Skills

Programming	Python, C/C++, MATLAB
Frameworks & Libraries	PyTorch, TensorFlow, Keras, OpenCV, Hugging Face Transformers
Models & Methods	CNNs, Vision Transformers, GANs, Invertible NNs, Perceptual Hashing
Other	Image processing, watermarking, multimedia forensics, MLOps basics

Experience

2017–2025 **Research Assistant**, *Network and Multimedia Systems Lab, Simon Fraser University*, Burnaby, Canada.

- Designed and implemented end-to-end computer-vision systems for image authentication, tamper detection, localization, and restoration.
- Developed and trained deep models (Invertible NNs, GANs, UNets) achieving high authentication/hash accuracy and robust tamper localization.
- Integrated classical watermarking with deep learning for hybrid protection frameworks resilient to compression, geometric transformations, and AI-generated attacks.

Selected Projects

ImageShield	A proactive image-protection system using invertible neural networks (INNs), robust watermarking, and perceptual hashing. Demonstrated high tamper localization accuracy and practical robustness against common distortions.
RDIAS	Robust Decentralized Image Authentication System embedding encrypted perceptual hashes with ECC codes; resilient versus deepfake-like and geometric attacks.
FlexMark	Adaptive watermarking framework offering customizable robustness-capacity trade-offs optimized for copyright protection and covert communication.
Makeup-Attack Detection	GAN-based makeup removal module to restore biometric-identifying features and improve face-verifier performance under cosmetic obfuscation.

Education

2025 **Ph.D., Computing Science (CGPA: 3.67/4)**, *Simon Fraser University*, Burnaby, Canada.

2019 **M.Sc., Computing Science (CGPA: 3.8/4)**, *Simon Fraser University*, Burnaby, Canada.

2017 **B.Sc., Electrical Engineering (CGPA: 3.8/4)**, *University of Tehran*, Tehran, Iran.

Publications (selected)

- M. Arab, A. Ghorbanpour, M. Hefeeda, *ImageShield: A System for Image Tampering Detection, Localization, and Recovery*, 2025 (in submission).
- A. Ghorbanpour, M. Arab, M. Hefeeda, *RDIAS: Robust Decentralized Image Authentication System*, ACM TOMM, 2025.
- M. Arab, A. Ghorbanpour, M. Hefeeda, *FlexMark: Adaptive Watermarking Method for Images*, ACM MMSys, 2024.
- M. Arab, P. Azadi, M. Hefeeda, *Detecting Makeup Attacks in Face-based Biometric Systems*, ACM Multimedia, 2020.

References

Available upon request.