Mohammad-Amin Arab

+1(778)319-3147 maarab@sfu.ca

Education

Doctor of Philosophy - Computing Science (CGPA: **3.67/4**) Expected: Summer 2024
Simon Fraser University, Burnaby, BC, Canada

Masters of Science - Computing Science (CGPA: **3.8/4**) August 2019
Simon Fraser University, Burnaby, BC, Canada

Research Interests

Multimedia Forensics, Computer Vision, Image Processing, Machine Learning, Deep Learning, Remote Sensing, Hyperspectral Imaging

Experience

Network and Multimedia Systems Lab, Simon Fraser University — supervised by: Prof. M Hefeeda
- *Research Assistant* Sept. 2017 – Now

- **SHIELD.** Our ongoing research focuses on SHIELD, a cutting-edge data-hiding system. SHIELD boasts high capacity and is designed specifically for tampering detection, localization, and content restoration. Through the innovative application of invertible neural networks, we aim to enhance the efficacy and efficiency of digital asset protection, ensuring the integrity and reliability of content in the face of potential manipulation.
- **FlexMark.** We propose FlexMark, a robust and adaptive data hiding method for images, which achieves a better capacity-robustness trade-off and can easily be customized for different applications from copyright protection to stealth communication.
  - M. Arab, A.Ghorbanpour, and M. Hefeeda, **FlexMark: Adaptive Watermarking Method for Images**, in Proc. of ACM Multimedia Systems Conference (MMSys'24), Bari, Italy, April 2024.
- **Revealing True Identity.** We design and implemented a novel solution to address makeup attacks, which are the hardest to detect in face-based biometric systems. In our solution, we design a generative adversarial network for removing the makeup from face images while retaining their essential facial features and then compare the face images before and after removing makeup.
  - M. Arab, P. Azadi, and M. Hefeeda, **Revealing True Identity: Detecting Makeup Attacks in Face-based Biometric Systems**, in Proc. of ACM Multimedia Conference (ACMMM'20), Seattle, WA, USA, October 2020.
- **Hyperspectral Imaging.** we present a method to prioritize the transmission of various components of hyperspectral data based on the application needs, the level of details required, and available bandwidth. Our method jointly and optimally selects the spectral bands and their qualities to maximize the utility of the transmitted data. It also enables progressive

transmission of hyperspectral data, in which approximate results are obtained with small amount of data and can be refined with additional data. This is a desirable feature for large-scale hyperspectral imaging applications.

  - M. Arab, K. Calagari, and M. Hefeeda, **Band and Quality Selection for Efficient Transmission of Hyperspectral Images**, in Proc. of ACM Multimedia Conference (ACMMM'19), Nice, France, October 2019.

Skills

Programming: Python [PyTorch, Tensorflow], MATLAB, and C/C++

References

- **Professor Mohamed Hefeeda**
  - Professor and Director, School of Computing Science — Simon Fraser University
  - mhefeeda@sfu.ca
- **Doctor Kiana Calagari**
  - Former Post-doc Researcher at Network Systems Lab, Currently Machine Learning Engineer at Ever AI
  - kcalagar@sfu.ca