

Ayesha Qaiser Hashmi

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Skills

- Strong foundation in Electrical Engineering with specialization in Computer Systems and Artificial Intelligence.
- Proficient in programming languages including Python, C++, Assembly Language, HTML, and SQL.
- Experienced with engineering tools: Visual Studio, Dev C++, Code Blocks, MATLAB, Atmel Studio, Anaconda, Cisco Packet Tracer, Arduino.
- Skilled in microcontrollers and embedded systems.
- Understanding of AI and ML concepts with application development.
- Excellent in teaching, time management, and team organization.

Education

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| - Air University
MS Electrical Engineering (Artificial Intelligence) | Islamabad, Pakistan
Sept 2022 – Jan 2025 |
| - National University of Computers and Emerging Sciences
BS Electrical Engineering (Computer Systems) | Islamabad, Pakistan
Sept 2017 – July 2021 |

Professional Experience

NUCES Visiting Instructor	Islamabad, Pakistan Jan 2024 – June 2025
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- Instructed undergraduate students in **Operating Systems, Digital Logic Design, Computer Organization and Assembly Language** and problem-solving techniques, fostering strong computational thinking and coding skills.
- Achieved a score of **85+** in student and peer feedback for effective lecture delivery and exceptional time management skills.

THESIS Optimization of Embedding Locations for Capacity Enhancement in Image Steganography	Completed Jan 2025
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- Designed and implemented a novel **edge detection-based steganography** framework using **Canny, Sobel, and Holistically-Nested Edge Detection (HED)** to optimize payload capacity while preserving imperceptibility.
- Achieved **>40dB PSNR** and **high SSIM scores** by embedding secret data in edge pixels (2 LSBs) and non-edge pixels (1 LSB), enhancing robustness against Gaussian, Poisson, and Salt-and-Pepper noise.
- Leveraged **morphological dilation** to expand edge regions, increasing embedding capacity by **~25%** compared to traditional LSB methods.
- Developed a **Python** pipeline for preprocessing, edge detection, and performance evaluation (PSNR/SSIM), ensuring reproducibility and scalability.
- Published findings on the trade-offs between **payload capacity, security, and imperceptibility**, proposing future integration with **transform-domain techniques (DCT/DWT)** and **cryptography** for hybrid security.