

# Erfan Habibi Ehsani

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## Education

**B.Sc. in Mathematics and Computer Science**, Amirkabir University of Technology, Tehran, Iran 2020 – Present

**Expected Graduation:** 2025

**Relevant Coursework:** Data Structures, Algorithms, Machine Learning, Advanced Programming

## Projects

### Server-Client Communication System

[github.com/Erfanhabibi/python-socket](https://github.com/Erfanhabibi/python-socket)

#### Highlights:

- Implemented a server-client communication system using Python's sockets for transferring images and audio data.
- **Server:** Utilizes Tkinter for the GUI and OpenCV for capturing images from the webcam, along with PyAudio for recording audio.
- **Prerequisites:** Python 3.x, OpenCV, PyAudio, Pillow.
- **Usage:** Run the `server.py` script, click "Start Server" to initialize, and capture images and record audio. Received files are saved in the `captured_images_server` and `captured_audio_server` folders.
- **Client:** Responsible for sending images and audio data to the server. Implemented separately based on the server's IP address and port numbers.
- **Notes:** Ensure proper network configurations for communication; adjust the IP address and port numbers in the code as needed.

### Message Broker System

[github.com/Erfanhabibi/MessageBroker](https://github.com/Erfanhabibi/MessageBroker)

#### Highlights:

- Developed a Message Broker system in C# to manage data transfer between producers and consumers while ensuring message order and persistence.
- **Endpoints:** Designed endpoints for producers to send messages and consumers to receive them.
- **Multithreading:** Implemented thread management to allow producers and consumers to define their required number of threads dynamically.
- **Message Persistence:** Ensured data durability by storing messages in files to prevent data loss in case of server failures or restarts.
- **Plugin System:** Designed a decoupled architecture using interfaces and attributes, enabling third-party developers to extend producer and consumer functionalities dynamically.
- **Retry Mechanism:** Implemented an automatic retry mechanism for failed message deliveries, ensuring messages are resent when the server is down and retried at configured intervals.
- **Logging System:** Developed a logging mechanism to track key operations such as message sending, receiving, storing, and recovery, with configurable log levels (Info, Warning, Error).

## Skills

**Programming Languages:** Python, C++, Java, C, C#

**Machine Learning:** Python libraries such as NumPy, pandas, scikit-learn, TensorFlow, Keras

**Image Processing:** Python libraries such as OpenCV, Pillow, scikit-image

**Data Mining:** Knowledge of data analysis and mining techniques (e.g., pandas, NumPy, BeautifulSoup)

**Networking:** Understanding of networking protocols, TCP/IP, and experience with socket programming

**Linux:** Basic knowledge of Linux concepts and commands

**Other:** Git, Algorithms, Data Structures, Problem Solving