Parsa Sinichi ▪ Mashhad, Iran ▪ p.sinichi@gmail.com ▪ |

EDUCATION

2020-Present B.Sc., Computer Engineering**,** Quchan University of Technology, Quchan, Iran
GPA (17.20/20) (top 5% of the class)

PUBLICATIONS

Amin Akhavan Saffar, **Parsa Sinichi**, Ehsan Koushan, Alireza Akbarzadeh Tootonchi: **Anticipatory Knee Joint Angle Estimation during Sit-to-Stand with Lumbar mounted IMU Feedback for Knee Exoskeletons using CNN**, *11th International Conference on Robotics and Mechatronics (ICRoM 2023) (Under review) (PDF)*

RELEVANT PROJECTS/EXPERIENCES

Summer 2023-Present: Development of a Raspberry Pi 4-powered control system for a lower-limb robotic exoskeleton (Undergraduate research assistant, FUM CARE, Ferdowsi University of Mashhad, Mashhad, Iran)
Supervisor: Prof. Alireza Akbarzadeh Tootoonchi [Google Scholar]

Knee angle estimation using a CNN from IMU data
- Recorded sit-to-stand movements of subjects using IMU sensors and used synchronized video as reference
- Utilized the MediaPipe library to extract joint angles and pose information from recorded videos
- Developed and trained a CNN model to infer the user's intent and predict joint angles based on the IMU data
- This work has resulted in the manuscript currently under review

Development of the control system's software
- Read load cell and IMU data needed for the control algorithm through I2C protocol
- Tuned the control algorithm's parameters to improve the exoskeleton's performance
- Implemented real-time battery monitoring, calculating and displaying battery percentage
- Developed a Raspberry Pi 4 program using WebSocket, enabling reliable connectivity with the robot's smartphone application for real-time control, sensor monitoring, and data recording

Development of a data logging system for EMG, IMU, and FSR sensors (Internship project)
- Utilized CAN protocol to communicate with and collect data from individual sensors, each with a different sampling rate
- Implemented data synchronization techniques to ensure data from all sensors was recorded at a desired sample rate of 200 Hz
- Designed a sensor disconnection detection system, capable of identifying the number of sensor disconnections and calculating the total downtime

2022-Present: Computer-vision based system for cloth identification and classification
- Used openCV to preprocess images
- Collected custom image data and labeled the images with Labelme
- Applied object detection for detecting clothes in real-world pictures
- Used a Siamese Neural Network for finding similarities in the images

2021-2022: Real-Time 3D hand tracking using computer vision and Unity
- Used MediaPipe in Python for a hand-tracking algorithm from a video feed
- Implemented message passing between Python and Unity using WebSocket
- Created a virtual representation of the hand in Unity for interacting with objects
- Demos of an early version with explanation: Video (in Persian)

2021-2022: Food vision (implementation of a deep learning system for food classification)
- Used EfficientNetB0 model for transfer learning and performed fine-tuning in Tensorflow
- Trained a model based on the Food101 dataset
- Project code example (Google Colab)

2021-2022: Teaching Assistant (Quchan University of Technology)
- Data Structures, Introduction to Programming

LANGUAGE PROFICIENCY

- Persian (Native)   - English (Fluent)

SOFTWARE AND TECHNICAL SKILLS

- **Programming:** Python, C++, node.js
- **Software:** Proteus, Unity, ROS
- **Technical/Hardware:** Raspberry Pi, Surface EMG, load cell, IMU data collection

AWARDS & HONORS

Winner of Barcode programming competition (Quchan University of Technology annual programming competition)

REFERENCES

Alireza Akbarzadeh Tootoonchi [Google Scholar]
Professor of Mechanical Engineering & Principal Investigator of FUM CARE
Ferdowsi University of Mashhad
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Mohamad-Hoseyn Sigari [Google Scholar]

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Malihe Javidi [Google Scholar]

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