GRAND VALLEY
STATE UNIVERSITY
THE GRADUATE SCHOOL

Graduate Assistantship (GA) Job Descriptions

Title: 3D human movement framework from 2D videos using machine learning.

Terms:
- Position type: a full-time (20 hour per week) position
- The beginning and ending date for the position: Fall 2021 and Winter 2022
- Student type: a full-time student only
- The stipend amount: $4,000 for full-time and corresponding tuition waiver (see **Graduate Assistantship Rules 2021-22**)

Responsibilities:
The GA will significantly focus on instructional and/or research responsibilities. The proposed position and responsibilities benefit the student educationally since through the work, the student will be able to learn 3D human motion study; how to use 3D motion capture system, how to collect, process, and analyze human motion data. Furthermore, the student will learn how to use Deep Learning toolkits to analyze human motion, and write a technical report and/or conference paper.
- Take part in trainings and presenting competence of 3D human motion capture system (optical and/or IMU-based). (5%)
- Recruit and schedule human subjects for the 3D motion study. (5%)
- Collect, interpret, and analyze biomechanical data and video, using data acquisition, signal processing, and statistical techniques. (15%)
- Conduct data preprocessing including annotation and tagging (20%)
- Develop data processing code in Python in a Linux environment (25%).
- Utilize a Deep Learning API (Keras or PyTorch) to develop an inference framework for 3D models. (25%)
- Write the report (5%)

Qualifications:
At least the entry-level experience of the followings:
- Eager to learn new technology
- Experience in the following:
  - OS: Linux (Ubuntu preferred)
  - Programming Language: MATLAB, Python
  - Scientific Toolkits: sciki-learn, numpy, panda, matplotlib
  - Deep Learning APIs: Keras and/or PyTorch

- Research experience and practical knowledge of research principles is required whether through previous internship, work experience, or coursework.
- Aptitude for performing repetitive tasks with a high level of accuracy is required.
- Creative problem-solving skills and critical thinking skills are required.
- Able to work with tight timelines while maintaining excellent attention to detail.
- Bachelor's or master's degree in engineering (Mechanical Engineering, Biomedical Engineering, Computer Engineering, or Computer Science) with skills mentioned above.

Work Station: The GA will work and use 3D motion capture system and computers at the Biomechanics and Motor Performance Laboratory (BMPL), room: CHS215, College of Health Professions, Grand Valley State University, 301 Michigan St, NE, Grand Rapids, MI., 49503. The GA will have a dedicated desktop to conduct the research.

Orientation: The candidate will have an orientation with responsibilities in August 2020. The candidate must demonstrate good organizational, time management, and communication skills, as well as intellectual independence and initiative. He/she will protect confidential and sensitive research data with integrity. The ability to work both independently and as part of a team with good ethic is essential.

Supervision and Evaluation: The GA will be supervised and evaluated directly by Dr. Lee.

Selection Process: If interested, please email a cover letter, resume and the contact information for two referees to: Yunju Lee, PhD. leeyun@gvsu.edu.

Contact Information of supervisor:
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