JAE-EUN (ESTHER) LIM

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EDUCATION

Carnegie Mellon University
Pittsburgh, PA
GPA 3.79/4.00

Bachelor of Science in Mechanical Engineering
Additional Major in Robotics
Spring 2018

SKILLS

Programming/Software
Python
C/C++
Java
SQL
MATLAB/Simulink

Frameworks/Applications
OpenCV
Django
AWS
Git

Languages
Fluent in Korean & English

RELEVANT COURSES

Computer Vision
Machine Learning
Feedback Controls System
Robotics Systems Engineering
Robot Kinematics and Dynamics
Fundamentals of Programming and Computer Science
Principles of Imperative Programming
Engineering Statistics and Quality Control

RELEVANT EXPERIENCE

Research & Development Engineer – Diamond Kinetics, Inc. *September 2018-present (Pittsburgh, PA)*
- In R&D team developing new baseball/softball swing/pitch metrics using sensor data processing and computer vision for video analysis. My tasks include:
  - Develop computer vision algorithms using object detection and tracking, image processing, and machine learning to facilitate baseball/softball motion analysis and validate calculations from sensors.
  - Design, test and analyze IMU and magnetometer data processing algorithms for baseball/softball pitches and swings.
  - Lead a journal club in discussions of computer vision and machine learning publications with development team.
- Create frameworks for generating new metrics and features in Python.
- Optimize physics engine algorithmically and using cProfile and Cython.
- Diagnose causes of physics engine errors and implement fixes.
- Owned entire physics engine for a new feature called Swing Fingerprint from start to its successful launch in November 2019.

CAD Design Automation Intern – **Kennametal, Inc.** *Summer 2018 (Latrobe, PA)*
- Developed application in C++ to automate tray loading for milling inserts.
- Created algorithm for arranging different shapes of milling inserts and optimized peg pitch on tray for space efficiency.

Research Assistant – Computer Vision Group, Robomechanics Lab, *Fall 2017-Spring 2018*
- Conducted research in visual odometry for bounding legged robots to explore the effect of pitch motion in visual odometry estimation.
- Created MATLAB simulation of the camera view of a bounding robot.

Software Engineer Intern – **Verify Apply**, *Summer 2017*
- Designed and implemented frontend and backend of website from scratch using Python and Django framework.
- Designed and built web pages using HTML, CSS, and JavaScript.

PROJECTS

Computer Vision, *Spring 2018*
- Implemented in MATLAB: Hough transform, bag of visual words, OCR using neural networks, image matching, stitching and homographies, 3D reconstruction, image alignment and tracking.

Machine Learning, *Spring 2018*
- Implemented in C++ and Java: decision tree, logistic regression, neural network, Hidden Markov Model, reinforcement learning.

Physical Pac-Man Game – Capstone, *Fall 2017-Spring 2018*
- Developed UI for the game using Python Kivy library.
- Designed and manufactured autonomous Pac-Man, tele-operated Ghost, and game board.

Robotics Projects – Introduction to Robotics, *Spring 2016*
- Designed nine robots with Lego Mindstorms and programmed them to implement PID control, dead reckoning, motion planning, localization, and forward/inverse kinematics.

GeaRace, *Spring 2015*
- Created educational car game in Python and Tkinter that teaches students the physics of gear trains.

LEADERSHIP AND ACTIVITIES

Teaching Assistant – **Introduction to Robotics**, *Spring 2017, Spring 2018*
- Organized and led labs. Helped students in office hours. Assessed students for the labs.

Outreach Chair, WoMEn@CMU (Senior Leadership Recognition), *Fall 2016 – Spring 2018*
- Organized outreach events to expose engineering to local middle/high school female students through in-class sessions composed of a lecture and a hands-on experiment.