Hae Jin (Hayley) Song

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https://cocoaaa.github.io/blog/

Education

Massachusetts Institute of Technology (MIT) — Cambridge, MA

- Candidate for a Master of Science in Electrical Engineering and Computer Science — Spring 2017
- Candidate for a Bachelor of Science in Mathematics — Spring 2017
- Candidate for a Bachelor of Science in Electrical Engineering and Computer Science — Spring 2017

Internship Experience

Robot localization and object detection

Intern at Keecker — *Summer,* 2016

- Improved the accuracy of robot's 3D position via camera calibration using Aruco and OpenCV in C++
- Built a recognizer for the Keecker logo that is robust in various illuminations and scales
- Implemented an Android application that commands the robot to rotate in search of the Keecker's logo and moves towards the logo upon its detection

Machine Learning and Web Development — Saclay, France

Intern in ILDA group at INRIA France — *Summer,* 2015

- Optimized the parameters of three classifiers (KNN, Linear SVM and Random Forest) and ranked their performances on gestural datasets
- Implemented a recommendation system to find the most useful set of gestures using the optimized classifiers
- Built a web application for Human Computer Interaction researchers to upload their datasets and interact with the results from the recommendation system

Research Experience

Computer Vision and 3D reconstruction — Cambridge, MA

Masters student with Regina Brazilay and Julian Straub in CSAIL, MIT — *On going (2016-2017)*

- 3D reconstruction using multiple depth sensors such as Kinect and Realsense; multiple camera calibration
- 3D model alignment using functional maps and detection of volume changes to help medical diagnosis of lymphedema
- Visual magnification of volume changes in 3D

Free-Flow: Unintrusive Reading Device for a Printed Text — Cambridge, MA

SuperUROP Researcher with Dr. Suvrit Sra in LIDS, MIT — *2015-2016*

- Developed a software for a hand-held, pen-style device that allows a quick search of words in printed texts
- Used Optical Character Recognition, filtering and image processing for word extraction and recognition

Data Science and Big Data — Cambridge, MA

Undergraduate Researcher in Anyscale Learning For All in CSAIL, MIT — *Summer, 2014*

- Constructed predictive models based on large data from medical and physical fields using data reduction, regression, classification and Gaussian Models on the cloud
- Parsed and organized raw data using Python and MATLAB, and then conducted statistical data analysis

Mcgovern Institute for Brain Research at MIT — Cambridge, MA

Undergraduate Researcher in Graybiel Lab — *2012 – 2014*

- Organized a large amount of neural data and improved the database using MATLAB
- Developed algorithms to test rats' decision-making and calculate reaction times
- Automated the outlier filtering and image alignment process using ImageJ and MATLAB
- Calculated the distances in 3D between an injection site and different parts of the brain

Camera Culture Group at MIT Media Lab — Cambridge, MA

Undergraduate Researcher — *Spring,* 2012

- Designed and developed glass-free 3D image layers and prototypes for exhibition using a laser cutter
- Reduced by half the amount of required materials by optimizing the alignment of the layers

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Papers & Presentations

Please visit: https://cocoaaa.github.io/blog/pages/publications/

- Generating Gaussian, Pictures, and Stories with Generative Adversarial Networks (Fall 2016)
- Automatic Cell Detection using HOG features and SVM (Fall 2016)
- Unintrusive Reading Device for a Printed Text (MIT EECS SuperUROP Poster Sessions, 2016)
- 3D air gesture recognition using Dynamic Time Warping and KNN (MIT EECS Poster Sessions, 2016)

Relevant Projects

- IOS application for 3D gesture recognition on air using Dynamic Time Warping and KNN
- Optimization of the blog traffic using a distributed memory caching system (Memcached)
- Analysis of Tweets and essays using Twitter API, sentiment analyzer and statistical inference techniques
- Modeling of Hidden Markov Model of a robot using message-passing algorithms
- Implementation of sampling techniques (Metropolis-Hasting, Gibbs) and Monte Carlo simulations

Scholarship

- MIT EECS - Foxconn Undergraduate Research and Innovation Scholar through MIT Research and Innovation Scholars Program

Leadership

MIT Yearbook and Photography Club (Technique) 2012 - 2013
Publicity Editor

- Applied graphic design skills such as Photoshop and In Design to publicize Technique's weekly meeting, book sales and Senior Portraits

MIT Experimental Study Group 2012 - 2013
Associate Advisor

- Organized academic and social events and connected the Associate Director with students

MIT Korean Class 2012 - 2013
Volunteer lecturer, recitation instructor

- Prepared curriculum and led lectures and recitations for the beginner and intermediate Korean classes at MIT as a volunteer

Skills

Languages: Korean (Native), English (Fluent), French (Intermediate)
Programming: Python, C++, MATLAB, Android Programming, Web development