DUCK HA HWANG

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OBJECTIVE

To utilize my training in machine learning and computer vision to solve challenging problems while making a positive impact on society

Proven talent for aligning business strategy and objectives with established electrical engineering and software development paradigms to achieve maximum operational impacts with minimum resource expenditures. In-depth understanding of the entire software development process (design, development, and deployment) from working in teams to develop a project from scratch. R&D on a broad range of computer vision, data modeling and machine learning topics leveraging various funding sources including government contracts, private funding, and external commercial partners. Self-motivated, high potential, engineering talents to find technology solution by self. Willingness and ability to quickly adapt and learn new technologies.

PROFESSIONAL EXPERIENCE

Computer Vision Engineer / Machine learning Engineer **SEPTEMBER 2015 TO MARCH 2017**
BIO-AND NANO-PHOTONIC LABORATORY (OZCAN GROUP) UCLA GRADUATE STUDENT RESEARCHER

PORTABLE COST- EFFECTIVE 2-D MICROSWIMMER IMAGING PLATFORM FOR SPERM HEALTH ANALYSIS

- Reconstructed hologram images into a visually recognizable object image using Fourier Transform Propagation, Amplitude, Phase image reconstruction and Auto-focusing (Tamera coefficient).
- Converted Jpeg photos into RAW(BGGR) image format: dcraw, pixel interpolation and pixel smooth.
- Applied binary image analysis to detect our target cell objects: Otsu's Method, Dilation and Erosion (Opening and Closing), Boundary extraction, thinning, thickening.
- Built the deep neuron networks to achieve 99% accuracy in label-free cell classification the system captures quantitative optical phase and intensity images and extracts multiple biophysical features of an individual sperm sample.
- Designed multi-frame track algorithm for multi-target using dynamic programming that employed the Current Statistical model.
- Authored and applied for object-oriented programs with Python and C++ simulated by MATLAB.
- Designed and developed user-friendly graphical user interface (GUI) system for testing, verification, configuring and controlling all parameters.

BIO-GAME

- Formulated and developed the newest version of a game designed to teach teenagers how to identify viruses in blood samples.
- Integrated Pedagogical theory with data analysis employing T-test of Microsoft Excel and Python to predict each student's performance
- Evaluated 5800 Korean students' performance to identify student learning patterns and built a pipeline to automate data extraction from the data warehouse to generate analytics results.

Software Engineer **OCTOBER 2013 TO OCTOBER 2014**
PELLUE INC., SEOUL, SOUTH KOREA

DAY.LY ANDROID APPLICATION

- Programmed voice support and news services for Android app using Java, catering toward busy lifestyles.
- Involved the writing SQL Queries and Joins; fixed bugs to add functionality and gave a professional look to the app.
- Participated in the Quality Assurance of the app including, testing of the User Interface and testing the app on different mobile devices.
- Working on custom libraries for generating views and layouts and integrated them into App.

EXCITING PROJECTS

Machine Learning **MARCH TO JUNE 2017**

- Using Unsupervised Learning (K-Means, GMM) analyzed a dataset containing data on various customers' annual spending amounts of diverse product categories for internal structure.
- Finding Donors for CharityML: Employed several supervised (GaussianNB, XGBoost, SVM) algorithms to accurately model individuals' incomes using data collected from the 1994 U.S. Census.
- Bag of Words: NLP (Natural Language Processing) technique to load and clean the IMDB movie reviews, then applying a simple Bag of Words model to get accurate predictions.
- Predicting Boston Housing Prices: Predicted real estate prices based on the house features with a decision tree regressor analysis.
- Titanic Survival Exploration: Built a decision tree model for predicting the survival of each passenger aboard the RMS Titanic.

UCLA - GRAPHS&NETWORK FLOW, PATTERN RECOGNITION **JANUARY TO DECEMBER 2016**

- POPULARITY PREDICTION ON TWITTER: Build linear model used to predict popularity on the tweets along with a method of Regression, Classification, and Singular Value Decomposition.
- EXPERIMENTS ON DEEP LEARNING WITH CONVOLUTION NEURAL NETWORKS: Trained and tested a typical convolutional neural network (CNN) structure in a task of classifying 10 object classes.
- PCA AND FLD FOR ANALYZING HUMAN FACES AND DETECTION BY BOOSTING TECHNIQUES: Developed ASM and AAM model for face reconstruction.
- FACE SOCIAL TRAIT AND POLITICAL ELECTION ANALYSIS BY SVM: Showed the correlations between facial attributes, social attributes, and election outcomes.

UCLA, 360 Degree Camera Module **APRIL TO JUNE 2016**

- Designed a device that can capture 360-degree snapshots or videos using multiple web cameras.
- Provided the advanced viewing interface has playback controls for changing viewing direction which allows a user to perceive a seamless 360-degree view, as a form of virtual reality.
- Computed Scale-invariant feature transform (SIFT), Random sample consensus (RANSAC), Homograph calculation, Seamless Stitching, Cylindrical projection, and Blinding.

EDUCATION

MASTER OF SCIENCE (M.SC.) IN ELECTRICAL ENGINEERING, COMPUTER VISION AND MACHINE LEARNING **MARCH 2017**
University of California, Los Angeles

BACHELOR OF SCIENCE (B.SC.) IN ELECTRONIC ENGINEERING, SIGNAL & SYSTEM **AUGUST 2013**
Kyonggi University, Suwon-si, Gyeongi-do, Republic of Korea, GPA: 4.10 / 4.5 (Major GPA: 4.42 / 4.5)

UDACITY - MACHINE LEARNING ENGINEER NANODEGREE **MARCH TO JUNE 2017 (ON GOING)**
Make Predictive Model, Co-Created by Google

DAT101X: MICROSOFT PROFESSIONAL ORIENTATION: DATA SCIENCE **APRIL 2017**
Course of study offered by Microsoft, an online learning initiative of Microsoft Corporation through edX.

AWARDS AND HONORS

- STATE SCHOLARSHIP, KOREA STUDENT AID FOUNDATION, REPUBLIC OF KOREA **2012-2013**
  - Three times awarded for excellent academic performance (Top 5% of school records)
- SCHOOL SCHOLARSHIP, KYONGGI UNIVERSITY **2011–2013**
  - Four times awarded for 1st,3rd,4th,6th Place in academic standing in the Electronic Engineering Department
- THE CAMPUS PATENT STRATEGY UNIVERSIADE AWARD, KOREAN INTELLECTUAL PROPERTY OFFICE **DECEMBER 2012**
- PATENT STRATEGY CONTEST AWARD, KYONGGI UNIVERSITY **DECEMBER 2011**

TECHNICAL SKILLS

Technical Proficiencies: Python (Expert, 3 years), MATLAB (Expert, 3 years), C++ (Advanced, 4 years), Java (Expert, 3 years), R (Skilled, 1 years), SQLite (Skilled, 1 years), QT (Skilled, 2 years)
Libraries: OpenCV, TensorFlow, scikit-learn, pandas, numpy
Hobbies: Weight-lifting (Official Instructor 1 years, Professional)