Melanie Kwon, MSCS

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LANGUAGES

ADVANCED: Python, Javascript (ES6, Typescript), Java
INTERMED.: SQL, CSS, VBA
BASIC: C++, R, Haskell

SKILLS

SOFTWARE DEVELOPMENT

Git, TDD, UNIX CLI, Basic Linux server administration (SSH), Familiar with AWS services (EC2, S3)

FULL-STACK WEB AND MOBILE APP DEVELOPMENT

FRONT-END: Bootstrap, JQuery, AJAX, Sass, Angular
BACK-END: NodeJS, Express, MongoDB, MS SQL Server, MySQL, PostgreSQL
TOOLS: NPM scripts, Webpack
TESTING: Mocha, Jasmine, Karma, Protractor
MOBILE: Ionic/Cordova, Nativescript

DATA SCIENCE / MACHINE LEARNING

Excel, Numpy, Pandas, TensorFlow/Keras, Scikit-Learn (*Clustering, Classification, Regression, SVM, Decision Trees, Ensemble Learning/Random Forests, Dimensionality Reduction, ANNs)*

COMMUNITY INVOLVEMENT

Volunteer – SoCal Data Science Conference 2017

Member – Association for Computing Machinery

EDUCATION

M.S., Computer Science, CSULA, pending Spring 2018

B.A., Political Science, UCLA, 2010

Deep Learning Specialization from deeplearning.ai

- Neural Networks and Deep Learning
- Hyperparameter tuning, Regularization & Optimization
- Structuring Machine Learning Projects
- Convolutional Neural Networks

EXPERIENCE

DATA SCIENCE RESEARCH LAB – CSULA — Los Angeles, CA
Research Project Manager / Python Developer — 2017 - Present

- Plan, lead, and coordinate an original, collaborative study with pathologists of LAC+USC/Keck Hospital to assess the diagnostic accuracy of convolutional neural networks trained on whole slide scanned cytology images.
- Engineered a data processing pipeline with Numpy, Pandas, OpenCV & OpenSlide APIs to pre-process large-scale Gigapixel pathology specimen images (100,000 x 300,000 pixels) for machine learning analysis.
- Trained a multi-class, custom object detector for detecting abnormal/dysplastic cells using Tensorflow Object Detection API.

KAISER PERMANENTE – DEPARTMENT OF RESEARCH AND EVALUATION — Los Angeles, CA
Operations Analyst / Programmer — 2015 - 2017

- Experience building SSRS reports and writing efficient stored procedures/views in MS SQL Server. Automated decision support applications and business intelligence reports in VBA/Excel/Access (Space Management, Grant Projection Tool).
- Provide Lean Six Sigma process improvements and operational/project support for study staff and research scientists.

MERCURY INSURANCE GROUP — Brea, CA
Business Systems Analyst — 2015

- Liaison between business and project team to translate business requirements to functional requirements for developers.
- Review requirements with QA, send UAT Approval requests, facilitate meetings to assess scope, gather estimates, determine dependencies to coordinate integration, and check project status to meet multiple upcoming deadlines.

WOMEN IN COMPUTING — Long Beach, CA
Front-End Developer — 2013 – 2014

- Front-end development in HTML5, CSS3, JQuery, and WordPress CMS. Modified custom PHP plugins using Plugin API.

CHILDRENS HOSPITAL LOS ANGELES — Los Angeles, CA
Project Coordinator — 2011 – 2012

- Plan/coordinate logistics for hospital-wide education and training workshops for over 4000 CHLA employees, USC faculty, and PMG staff. Streamlined onboarding procedures and facilitated monthly new hire and new manager orientations.

UCLA ANDERSON SCHOOL OF EXECUTIVE EDUCATION — Los Angeles, CA
Program Management Intern — 2008 – 2010

- Provide administrative and project support for executive education staff. Query and analyze program evaluations with Salesforce data for the department's market research needs (analysis via Excel pivot tables, INDEX/MATCH formulae)

FEATURED PROJECTS

Full Stack Web and Mobile Application Development

K Star Café – Full stack web & mobile applications featuring a café/restaurant. All written in Javascript.

- K-Star-Cafe-Angular: **Single-page Application** using Typescript and **Angular** framework (Ver 4.x). Responsive UI design in **Angular Material** and **Angular Flex-Layout**. Demonstrates use of Observables, reactive programming with **RxJS**, and **Restangular** for communicating with a server supporting REST API.
- K-Star-Cafe-IonicCordova: **Hybrid mobile application** using **Ionic** framework (Ver 3.x) and **Cordova** hybrid application framework to target multiple mobile platforms with a single codebase. Features push notifications, sending emails and calls, and social media sharing.
- K-Star-Cafe-Nativescript: Cross-platform, **native iOS and Android app** built with **NativeScript** (Ver 3.x). Features a truly native mobile UI feel, animations, gestures, and performance. Supports offline storage with SQLite and **Couchbase**
- K-Star-Cafe-RESTAPI: Full-fledged back-end **RESTful API** server developed using **NodeJS, Express, MongoDB and Mongoose**. Token-based **user authentication** with Passport-JWT. Includes **HTTPS** secure communication, form-based file upload with Multer, Cross-Origin Resource Sharing (CORS) and **OAuth2** authorization for Social Authentication via Facebook credentials.

Data Science / Machine Learning

CERVICAL CYTOLOGY IMAGE CLASSIFICATION USING CONVOLUTIONAL NEURAL NETWORK [SCIKIT-IMAGE, CAFFE]

- Dataset: Aggregated from 3 sources - Herlev pap smear database, International Agency for Research on Cancer, Bethesda System for Reporting Cervical Cytology 3E. 1620 images labeled into 3 classes according to cellular dysplasia/abnormality.
- Developed a single-label, 3-class classification model trained from scratch on AlexNet architecture.

BREAST CANCER RISK ANALYSIS [NUMPY, PANDAS, SCIKIT-LEARN]

- Dataset: Breast Cancer Wisconsin Data Set (original). 699 data points which include nine characteristics of a minimally invasive fine needle biopsy, including clump thickness, uniformity of cell size, adhesions, etc.
- Trained predictive models using Adaboost and Random Forest classifiers to determine patients' cancer risk.

EIGENFACES – FACIAL RECOGNITION ALGORITHM USING NON-LINEAR SVM [NUMPY, PANDAS, SCIKIT-LEARN]

- Dataset: Olivetti database from AT&T research lab. 400 face images from 40 people (10 images per person).
- Computed Principal Components Analysis using unsupervised feature extraction / dimensionality reduction. Trained a non-linear Support Vector Machine classification model.

HEART DISEASE PREDICTION – DATA EXTRACTION, ARTIFICIAL NEURAL NETWORK [BEAUTIFULSOUP, SCIKIT-LEARN]

- Dataset: https://archive.ics.uci.edu/ml/machine-learning-databases/heart-disease/heart-disease.names Aggregated databases of heart disease diagnoses collected from four different medical centers.
- Parse features from web page and pre-process/clean data using regular expressions. Used PCA to reduce dimensionality of the data and trained artificial neural network classifier to predict patients' likelihood of heart disease.

PREDICTING MEDIAN HOUSE VALUES IN BOSTON – SCALAR REGRESSION [NUMPY, KERAS/TENSORFLOW]

- Dataset: Boston housing dataset from mid-1970s with only 506 data points about area's crime rate, local property tax, etc.
- Prepared data with feature-wise normalization, defined/trained two layer artificial neural network model and evaluated model using K-fold cross-validation.

CAR DETECTION FOR AUTONOMOUS DRIVING – YOLOv2 [NUMPY, PIL, KERAS/TENSORFLOW]

- Dataset: Drive.ai sample dataset, pictures taken from a camera on the streets of Silicon Valley.
- Utilized a pre-trained Keras YOLOv2 model to engineer a car detector for street camera videos. Draws bounding box and predicted confidence scores around detected vehicles.

EMAIL MARKETING CLUSTER ANALYSIS FOR CUSTOMER BASE SEGMENTATION [MS EXCEL, K-MEANS CLUSTERING]

- Dataset: WineKMC.xlsx from wiley.com/go/datasmart. Two sources: Metadata of each product offering, transactions log.
- Employ cluster analysis to create market segmentation for targeted email marketing. Use the Solver to minimize the total distances of customers from their cluster centers to determine customers' favorite deals.

REUTERS NEWS – MULTI-CLASS TEXT CLASSIFICATION [NUMPY, KERAS/TENSORFLOW]

- Dataset: Reuters dataset, a set of short newswires and their topics published in 1986.
- Built predictive model to classify articles of text into one of 46 topics. Use one-hot encoding to vectorize the text data for input and define and train a three layer artificial neural network model.