Ming-Chang (Eric) Chiu

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INTERESTS

My personal interest is at the intersection of computer cognition, machine learning and high-performance computing

EDUCATION

University of Southern California (USC) — Los Angeles, CA

Master (M.S.) in Electrical Engineering — Aug 2016 – May 2018 (Expected)
- Areas of Specialty: Data Science, Digital Signal Processing
- GPA: 3.673 / 4.0

National Tsing Hua University (NTHU) — Hsinchu, Taiwan

Bachelor of Science (B.S.) in Computer Science & Electrical Engineering — Sep 2011 – Jun 2015
- Last 60 GPA: 4.05 / 4.30, Cumulative GPA: 3.82 / 4.30

University of Minnesota — Twin-Cities, MN

Exchange Student in Computer Science and Engineering — Fall 2014
- GPA: 4.0 / 4.0, 15 credits

Tsinghua University — Beijing, China

Summer Exchange Student in Computer Science — Summer 2012

WORK EXPERIENCE

Information Retrieval and Data Science Group, USC — Los Angeles, CA

Researcher [Project: TensorFlow trained Byte Histograms for Better MIME Detection] — Sep 2017 – Present
- Developing Tensorflow models to extract fingerprints of file types for network security in TREC-DD data and evaluating neural network models with Apache Tika default
- Generating byte frequency analysis signatures for particular MIME types and accumulating this signature for near 90 file types in the TREC-DD polar dataset
- Integrating a command-line interface that can be run on the TREC-DD-Polar data

Institute for Creative Technology — Los Angeles, CA

Researcher [Project: Conversation Quality Assessment] — Jan 2017 – Present
- Trained Long Short Term Memory (LSTM) deep learning model and word embeddings for behavioral modeling based on Fisher and alcoholism treatment data
- Predicted new conversation and treatment session quality reaching 75% accuracy
- Generated conversation snapshots on top of Fisher dataset and created Amazon Mechanical Turk jobs to collect objective assessments from people

Illumina, Inc. — San Diego, CA

DevOps Applications Intern — May 2017 – Aug 2017
- Built a machine learning Cron for analyzing jobs in the High Performance Computing cluster to identify "destined to fail" jobs using Sci-kit learn, reaching 95% accuracy
- Developed a deep learning Daemon that constantly loads new samples from database (Hive) to train a classification model using Mini-batch update technique with TensorFlow, achieving 78% accuracy
- Maintained enterprise Atlassian Jira and Confluence; created customer workspaces for internal clients

Republic Of China (Taiwan) Army — Dongyin, Matsu

Soldier — Sep 2015 – Aug 2016
- Led physical and mental training sessions and proposed smartphone usage regulations

Vision Science Lab, NTHU — Hsinchu, Taiwan

Research Assistant [Project: The World is Changing: Finding Changes on the Street] — Feb 2015 – Sep 2015
- Constructed image change detection model in MATLAB, successfully detected street view mismatches in Dash camera images with respect to preprocessed Google Street View (GFV) to provide updated information
- Applied RANSAC to re-outline the areas of mismatches in the original GFV images with accuracy outperforming baseline by 46%
- Devised a reusable manual labeling software and data types that recorded ground truth mismatch areas to help data collection

Large-scale System Architecture Lab, NTHU — Hsinchu, Taiwan

Research Assistant [Project: Re-scheduling Computing Job on Large-Scale System] — Jul 2013 – Aug 2014
- Automated Hadoop benchmark (HiBench) to test performance of processing 8 types of computing job on 2 heterogeneous clusters using Perl
- Designed testing environment settings using Linux BASH shell scripts and analytically found suitable disk for certain computing job types
- Applied machine learning algorithm on Linux resource usage to discern types of computing and then moved the data to either Hard Disk or Solid-State Disk to proceed and so reduce power consumption

Broadsound Corporation Hsinchu, Taiwan

Intern Jul 2013 – Sep 2013

- Produced product Wind Gauge, including product design, supply chain analysis, assembling, calibrating, testing, and exporting
- Developed part of all-in-one ProCheck software in C (featuring ultrasound probe calibration, testing, and data collection) which became a major revenue source
- Generated about $100K with teammates

PROJECTS

Kaggle: German Credit Risk Github May 2017

- Used Python Pandas library to implement a reproducible pre-processing function for raw text data
- Designed Python Scikit learn pipeline to automate the machine learning grid search and model selection on 15+ variables
- Applied SVMs, Neural Network, Random Forrest, Dimension Reduction, etc. algorithms and achieved 75% accuracy, outperforming baseline by 5%

Markov Chain Monte Carlo (MCMC) for optimization Github Nov 2016 – Dec 2016

- Implemented MCMC Simulated Annealing procedure and 3 cooling schedules to find global minimum of Schwefel function; found best cooling schedule, achieving performance at least 10% better than the others
- Improved variance of estimation by applying 3 variance reduction methods, with each at least 5 times outperforming pure MC and best variance close to 0 (nearly perfect)
- Utilized Metropolis-Hastings Algorithm to sample from arbitrary tricky spaces and reduce corresponding variances

Movie Recommender Mar 2015 – Jun 2015

- Implemented and tested 3 collaborative filtering algorithms in Python and utilized MovieLens dataset to recommend movies
- Back-end analysis system deployed on AWS EC2, enabling the recommender to regularly update recommendations by checking new user preferences
- Created front-end webpage using jQuery, AJAX and Bootstrap for visual effect

Dictionary Search Engine Github Feb 2015 – Apr 2015

- Implemented PageRank algorithm for Apache Hadoop in JAVA and constructed a search engine which prioritizes relevant links
- Coded under scalable MapReduce framework on 8-node distributed computers allowing massive dataset to be processed
- Devised file system database for dictionary content retrieval by applying Apache Hbase and Hive

Autonomous Robotic Convoy System Design Github Oct 2014 – Dec 2014

- Proposed an algorithm that allows rovers to move toward one and only one target even when doing sharp turns using C++
- Utilized ultrasonic sensor to detect object distances and translated information into 2D surface using gnuplot as human computer interface
- Devised a paradigm to discern the original moving object while multiple static and moving objects are present

Remote Control Car Github Apr 2014 – Jun 2014

- Designed flip-flop circuit that controls electric current and connects power, RF dongle, and embedded controller; manipulated controller behavior in Python
- Developed a smartphone application in JAVA, using Bluetooth Low Energy to transmit control signal

Midnight Radio: A Shared Online Radio Platform Github Apr 2014 – Jun 2014

- Developed front-end webpages using jQuery, AJAX and Bootstrap featuring user/administrator portal, chatting room, music play list, etc.
- Built back-end user upload system, administrator supervision function, and music information database in PHP and MySQL

One-on-one Chinese Chess Game Aug 2012 – Sep 2012

- Designed graphical user interface and implemented the rules of the game with Qt (C++)
- Applied C++ Internet thread programming which allows users to play through Internet connection

SKILLS

Languages: Python, C/C++, MATLAB, Ocaml, Java, HTML/CSS, PHP, SQL, BASH, Javascript
Technologies: Hadoop, AWS, Git, jQuery, Linux, Spark

RELATED COURSEWORK

Machine Learning, Analysis of Algorithms, Pattern Recognition, Probability Theory, Simulation Methods for Stochastic Systems, Digital Signal Processing, Cloud Programming, Computer Graphics, Scientific Computing, Numerical Analysis, Operating System, Web Technologies, Software Engineering

HONORS & AWARDS

Selected as Honorary Member of Phi Tau Phi Scholastic Society (only 1 in department) 2015
Awarded Excellent Study Group Award, NTHU 2015
Awarded National Tsing Hua University International Exchange Scholarship; Amount: $10K 2014

LEADERSHIP

NTHU Orchestra, National Tsing Hua University
Vice President Jul 2012 – Jun 2013

NTHU Student Council, National Tsing Hua University
Counselor Jul 2012 – Jun 2013

REFERENCES

Robert Suarez
Illumina, Inc.
Associate Director, Scientific Computing
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Professor Stefan Scherer
University of Southern California
Institute for Creative Technology
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