LI-YIN(LILY) YOUNG

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ABOUT ME

I have released 10+ open source projects with Python and C++ on GitHub. In additional to algorithm design, I also have experience in developing agile website with Node.js and React in virtual server environment. I recently have worked on transforming the machine learning algorithm into API by React and Flask.

PUBLICATION

Li-Yin Young, **The Effect of Moderator bots on Abusive Language Use** *Proceedings of the International Conference on Pattern Recognition and Artificial Intelligence. ACM, New York, NY, USA.* 2018

RECENT PROJECTS

Generation of Financial Time Series by GANss **Jan. 2020-Present**

Adviser: Professor Yu-Jui Huang

- Developed machine learning architecture by Wasserstein generative adversarial Networks(WGANs) to approximate a realistic asset price for financial trading strategies.
- The model successfully applied for constructing high-dimension model from stochastic process(random process) The Root Mean Square Error(RMSE) of the model is 0.1%.
- Parallized the two neural networks in WGAN synchronously and mathematically which sped up training by 40%
- Released python package for recognizing feature in multidimensional objects to PyPI. The computational time is 50% less than Monte Carlo method.
- Implemented the unit test from data collection to machine learning algorithm to achieve maximum coverage for data pipeline to infrastructure of neural network.

Stock price prediction using Hidden Markov Models **July. 2018-Present**

Adviser: Professor. Xiaochuan Cai and Professor. Daniel Appelo

- Built financial time series model with HMM and Euler–Maruyama method to forecast stock price.The RMSE is 0.3%.
- Generalized the algorithm that allowing Stochastic differential equation (SDE) to adjust parameters based on Markovian process in high dimensions.
- Processed the signals emitted from daily trading data by SciKit-Learn to identify hidden state for daily stock.
- Transformed the machine learning model into API by React, Node.js and Flask.
- Implemented unit test for machine learning to achieve maximum coverage of its infrastructure.

Parallel WaveHoltz 2D embedded boundary code. **March. 2020-May. 2020**

Group Project

- Distributed training across multiple nodes in Docker on heterogeneous supercomputing cluster(RMACC Summit).
- Setup clusters to scale up wave equation to distribute the parameters on multiple machines.
- Responsible for parallized the C++ codes with MPI. The total time successfully drop down 88% after that.

Detect the hidden pattern using machine learning **March. 2017- Now**

Adviser: Professor Yu-Jui Huang

- Extracted patterns' information on any kind of geometric surface by finding the solutions of PDE using machine learning algorithm.
- Built the ANNs application by Tensorflwo for finding the solutions of partial differential equations for solving physics problems e.g. fluid, thermal.
- Built a data-efficient deep learning algorithm using only 10% of data comparing to the current models. The accuracy of approximating the solutions of partial differential equation with up to 95%.
- Distributed training across multiple nodes with MPI in Docker in Azure. The total time successfully drop down 88% after that.

WORK EXPERIENCE

Full Stack Developer

Main Street Exchange *Jun.2016-Aug.2018*

- Responsible for full stack web development, utilizing primarily MySQL for database management, PHP for back-end infrastructure and JavaScript for making dynamic forms.
- Worked on the task related to the development of software in real-time system, including all the implementation and QA test execution.
- Integrated third party applications such as Linkedin API and Adobe Sign API to the website.
- Working with scripting tools and virtual server environments to troubleshoot real-time system issues.

Machine Learning Engineer
TopicTechnology *Jan. 2016-May. 2016*

- Engineered a natural language, concept search web application in Node.js backed by semantic role labeling.
- Created social media sentiment analyzer with NLTK to identify the market and competitive landscape with up to 95% fidelity.
- Built machine learning systems for extracting sentimental information to identify the market and competitive landscape.
- Created classifier with topic model for coping with large amount of unstructured text information from online media.
- Filtered and cleaned unstructured dataset ruling out the irrelevant data.

Software Engineer Intern
Millennium Engineering & Integration *Summer 2014*

- Built the support vector machine(svm) application on time series prediction with C++.
- Setup clusters to scale up traning data and distribute the parameters on multiple machines.

EDUCATION

Master of Science, Applied Math, emphasis on machine learning
University of Colorado Boulder, Boulder, CO, U.S.A., Aug 2018 - May 2020
Master of Science, Computer Science,
University of Colorado Boulder, Boulder, CO, U.S.A., Aug 2013 - June 2015
Chang Gung University, Taoyuan, Taiwan
Bachelors of Science, Information Management, September 2008- June 2012

ENGINEERING SKILL

- **Languages:** Python, MySQL, C++/C
- **Library:** TensorFlow, Keras, SciKit-Learn, NumPy, Pandas
- **Other Skill:** Git, Docker, Azure, multiprocess, multithread, MPI