CAROLYN (CHIH-HSUAN) KAO

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PROFESSIONAL SUMMARY

Driven to learn quickly, advance programming proficiency and training in Computational Mathematics. Solid background in Quantitative Research and Data Science settings supporting team needs. Motivated team player focused on boosting efficiency and performance with analytical and detail-oriented approaches.

Advanced proficiency in Python, Java, C++, R, MATLAB, Julia, UNIX and Linux Shell
Intermediate skills in TensorFlow, PyTorch, SQL, SAS, Excel VBA and Stata
Earned Chartered Financial Analyst (CFA) Level I

EDUCATION   SEE COURSEWORK UNDER CHKAO831.GITHUB.IO

STANFORD UNIVERSITY   **Stanford, CA**
M.S. Computational and Mathematical Engineering; CGPA 3.932/4.3   *Sep 2019 – Jun 2021*
- Coursework in Deep Learning (DL), Natural Language Processing (NLP), Reinforcement Learning, Time Series Analysis, Algorithmic Trading, Software Development, Numerical Analysis, Optimization, Stochastic Control Process, Distributed Computing, Mathematical Finance, Differential Equations.

UNIVERSITY OF CALIFORNIA SAN DIEGO   **La Jolla, CA**
Graduated magna cum laude with CGPA 3.878; Awarded Honors with Distinction in Management Science; Member of Phi Beta Kappa; Participated in the National Name Exchange in 2018-19
B.S. Applied Mathematics; GPA 3.91/4.0   *Sep 2015 – Jun 2019*
- Coursework in NLP, Java OOP, Data Structures, Applied Computing, Probability Theory, Mathematical Statistics, Real Analysis, Optimization, Multivariable and Vector Calculus, Actuarial Mathematics.

B.S. Management Science (Quantitative Economics); GPA 3.87/4.0   *Sep 2015 – Jun 2019*
- Coursework in Operations Research, Micro/Macroeconomics, Corporate Finance, Financial Markets, Industrial Organization, Accounting, Econometrics, Decisions Under Uncertainty, Financial Mathematics.

WORK EXPERIENCE   LINKEDIN@CHKAO831

Taiwan Semiconductor Manufacturing Company Limited (TSMC)   **Hsinchu, Taiwan**
ML Data Scientist of R&D Information Technology   *Aug 2021 – Sep 2022*
- Facilitated the ML-assisted MMonCa and Coventor (TSMC inhouse simulators) calibration by optimizing over high-dimensional chemical parameters, contributing to a 90% increase in predictive accuracy and establishing new baseline references for selected reaction systems under TSMC's 2nm development.
- Developed and optimized the Multi-model Search Kernel, leading to a computational speedup of 10X and 82% decrease in MAE in support of TCAD (Tech Computer-Aided Design) and Epitaxy research.
- Rewarded Divisional Quarterly Star of TSMC AAID (AI Application Integration), 4th Quarter of 2021.

Cathay United Bank   **Taipei, Taiwan**
Credit Risk Measurement Analyst Intern   *Jul 2019 – Aug 2019*
- Provided technical insight to the strategy team, defining and delivering analysis with Python, R and MS Excel to support the team goals in enhancing their credit decisioning capabilities.

RESEARCH PROJECTS   SEE PORTFOLIO UNDER CHKAO831.GITHUB.IO

Automated Parameter Tuning for Land Ice Simulations   *Sandia Nat'l Labs* (*Jun 2021* at **Stanford, CA**)
Mentored by Jerry Watkins, Ph.D. and Irina Tezaur, Ph.D. from Sandia, individually working on developing a framework to automate the parameter tuning process of the MPAS-Albany Land Ice (MALI) Model on HPC. My 3-month work is part of the *Ice-sheet Modeling with MALI* [arXiv: 2204.04321] research, which lasted for 2 years.

Using RCNN to Predict S&P 500 Movements [NLP; PyTorch]   *Stanford Univ.* (*Mar 2021* at **Stanford, CA**)
Constructed RCNN models with various attention mechanisms given a hybrid inputs of both news title and DJIA market indices to estimate the short-time market directional movements in an efficient manner.

Artistic Style Generator w/ CycleGAN & VGG19 [TensorFlow]   *Stanford Univ.* (*Dec 2020* at **Stanford, CA**)
Implemented two artistic style generating architectures to map from the Vincent Van Gogh dataset to real landscape photos in the respect of artistic style and content, generating corresponding stylized image outputs.

Classifying Types of Toxicity in Wikipedia Comments [NLP; TensorFlow]   *UCSD* (*Dec 2018* at **La Jolla, CA**)
Developed a series of Deep Learning models (LSTM; Bidirectional RNN with LSTM; CNN, etc.) to predict if some Wikipedia comments contain specific forms of toxicity using supervised learning.