Jialing Cai

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Education

- **University at Buffalo** — Buffalo, NY
  - Computer science and engineering — *Aug 2024 -*
- **University at Buffalo** — Buffalo, NY
  Master of Science (Research Track) - Computer science and engineering — *Aug 2023 - May 2024*
- **University at Buffalo** — Buffalo, NY
  Master of Science - Econometrics And Quantitative Economics — *Jan 2021 - Jun 2022*
  - Major GPA: 3.33/4.0
- **University at Buffalo** — Buffalo, NY
  Bachelor of Arts - Economics — *Aug 2017 - Dec 2020*
  - Major GPA: 3.68/4.0

Publication

1. Mingzhen Huang, Shan Jia, Zhou Zhou, Yan Ju, **Jialing Cai**, Siwei Lyu, "EXPOSING TEXT-IMAGE INCONSISTENCY USING DIFFUSION MODELS", submitted to Conference on International Conference on Learning Representations (ICLR)
2. Yan Ju, Shan Jia, **Jialing Cai**, Haiying Guan, and Siwei Lyu, "GLFF: Global and Local Feature Fusion for Face Forgery Detection", submitted to IEEE Transactions on Multimedia (TMM)
3. Shan Jia, Mingzhen Huang, Zhou Zhou, Yan Ju, **Jialing Cai**, Siwei Lyu, "AutoSplice: A Text-prompt Manipulated Image Dataset for Media Forensics", Conference on Computer Vision and Pattern Recognition Workshop (CVPRW)

Experiences

- **UB Media Forensic Laboratory, University at Buffalo** — Buffalo, NY
  Research Project Assistant, advised by Prof. Siwei Lyu — *May 2022 - Current*
  - Focus on Deepfake image generation and detection, with work published in the IEEE Transactions on Multimedia (TMM).
  - Participate in creating two subsets of a new Deepfake dataset termed DeepFakeFaceForensic (DF^3): (1) face blending, which replaces faces in real-world pictures with synthetic faces; (2) multi-image compression, which applies video compression algorithms onto Deepfake image sequences.
  - Reimplement the previous Deepfake detection method SimSwap on the new DF^3 dataset.
  - Participate in testing the performance changes of existing Deepfake detectors on compressed image/video.
  - Generated AI-synthesized images for a novel dataset, which was a key component of research accepted and published in the CVPR 2023 workshop
- **KIRUNIVERSE** — Remote
  Community Growth Intern — *Jul 2019 - Dec 2019*
  - Perform data analysis on weekly reports that outline progress against KPI objectives.
  - Revamp plans to enhance the company's capability of maintaining and recovering critical business functions.
  - Track the engagement of social networks to identify high-performing ideas for campaigns.

Projects

- **Investment Project: All Equity Portfolio** (project management, financial analysis, asset evaluation)
  - Select at least 40 companies from the S&P 500 index and place trades daily.
  - Build an equity portfolio on the virtual trading platform and manage as a professional investment manager.
  - Rational analysis and allocation of various securities, including shareholdings, bonds and real estate to meet specified investment goals.
  - Make a financial statement to report the portfolio's revenues and costs, as well as its cash flows from operating, investing, and financing activities.
- **Breast Cancer Detection** (Python, machine learning, image classification)
  - Data cleaning and prepossessing, including dimension reduction, and normalization.

- Build several classification models (*e.g.*, random forest, decision tree and logistic regression), and tune the parameters with grid search.
- Achieve a 96.5% accuracy, with results visualization (*e.g.*, feature correlation, ROC curve and confusion matrix).

- **Machine Learning-Based Web App for Diabetes Detection** (Python, machine learning, web app)
  - Develop a random forest classification model for binary classification, achieving an accuracy of 78.6%.
  - Develop a web application to achieve virtual diabetes diagnosis.

Skills Summary

- **Languages**: Python, JAVA, JavaScript, C++, Matlab, HTML
- **Python Libraries**: Pandas, Scikit-learn, Numpy, Matplotlib, Seaborn, Tensorflow, streamlit
- **Skills**: Probability and Statistics, Econometrics, Statistical analysis and Data visualization
- **CS Courses**: Data Structure and Algorithm, Artificial Intelligence, Discrete Math, Computer Organization, C++