Bill Sun

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EDUCATION

Columbia University, New York, NY — Aug 2020 – December 2023

- B.S in Computer Science, Math Minor — GPA: 3.993
- Activities: AI@Columbia (Director of Education), Columbia Robotics Club, Columbia Economics Society
- Coursework: Computer Vision: Learning, Advanced Programming, Machine Learning, Computer Science Theory

PROFESSIONAL EXPERIENCE

Software Developer, KnoxEdge — March 2021 – Present

- Built chrome extension for automatic sentence highlighting of webpages based on customizable keyword thresholds
  - Deployed TF-IDF keyword extraction API endpoints using flask; Built the UI using React.js and Ant Design library
- Using solidity to create smart contracts/mint NFTs as part of a community-driven learning and information-sharing platform

Undergraduate Researcher, Digital Video and Multimedia Lab, Columbia University — Aug 2020 – Jan 2021

- Project – "Improving Few-Shot Object Detection through Attention-RPN and Enhanced Multi-Relation Detector"
  - Benchmarked a Faster RCNN-based few-shot object detection algorithm on the 2014 and 2017 COCO Datasets
  - Developed an improved module for few-shot classification using PyTorch and Detectron2

Research Intern/ Independent Study, Computer Science Dept., University of Miami — Aug 2018 – Aug 2020

- Project – "Deep Convolutional Neural Networks for Malaria Parasite Identification in Thin Blood Smear Images."
  - Implemented the You-Only-Look-Once object detection algorithm to segment blood cells from whole smear images
  - Trained custom CNN to classify individual cells as either infected or uninfected by malaria parasite with <96% accuracy
  - Developed web app with Flask and React.js to host the deep learning models (malariadiagnosis.pythonanywhere.com)
- Project – "Machine learning as a surrogate for stress analysis in artificial heart valve design"
  - Compared performance of autoencoder-based neural network and feed-forward neural network in predicting stress and deformation of aortic valves under systolic pressure using MATLAB, Python, Keras, and Tensorflow

Research Intern, Bioinformatics and Bio-Imaging Lab, Georgia Institute of Technology — June 2019 – July 2019

- Project – "Universal Lesion Detection through the You-Only-Look-Once Algorithm"
  - Extracted and preprocessed <90 gb of image data from DeepLesion dataset using opencv and matplotlib
  - Compared predictive performance of Faster RCNN, You-Only-Look-Once, and other object detection algorithms to detect and classify various types of lesions (e.g. bone, liver, lymph) from assorted CT images using Tensorflow

PROJECTS

CovidSupplyShipper (github.com/billsun9/mern-covid-app)

- Developed full-stack web platform using React.js for frontend, Node.js/Express for custom APIs, and MongoDB Atlas for a database, which connects people who need emergency supplies and resources during COVID-19 to those who need it
  - Frontend incorporates Google Maps and Google Geocoding APIs to process user input location data

StyleTransfer (styletransfer1.pythonanywhere.com)

- Created web app with Flask backend that automatically styles user images with various famous artwork styles (e.g. Picasso, Kandinsky), via open-source neural style transfer algorithm on tensorflow_hub library

ClimateTracker (github.com/billsun9/ClimateTracker)

- Scraped web using BeautifulSoup/requests for historical climate data, energy consumption by each state, and recent climate news
- Used SpaCy NLP package in Python to generate summaries and lists of keywords from scraped news articles

Summarizr (summarizr1.pythonanywhere.com/)

- Developed a sentence weighting-based extractive text summarizer using NLTK and networkx in python
- Summarizr won "Best ML Hack" at Columbia's DevFest '21 Hackathon

PUBLICATIONS

1. Liang L and **Sun B** "A Proof of Concept Study of Using Machine-Learning in Artificial Aortic Valve Design: From Leaflet Design to Stress Analysis", **Bioengineering**. 2019 Nov 8;6(4). pii: E104. doi:10.3390/bioengineering6040104.
2. **Sun B** and Liang L, "Towards a robust and affordable approach for automated malaria diagnosis from microscopy images," Eighth International Conference on Learning Representations (**ICLR**), Addis Ababa, Ethiopia, April 26-30, 2020

SKILLS

Languages: *(Proficient)* Python, JavaScript, Java *(Familiar)* MATLAB, C, SQL, Solidity, HTML, CSS

- Python Libraries: TensorFlow, PyTorch, Detectron2, SpaCy, Huggingface, Pandas, Pillow, OpenCV, Matplotlib, Scikit-Learn
- Other Frameworks/Tools: React.js, MongoDB, Google Cloud APIs, AWS, Object Oriented Programming, Git