Huan Xu

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Education

University of Wisconsin-Madison May 2023
Computer Sciences (honor), Mathematics, Statistics B.S. Madison, WI

- Cumulative GPA：3.94 / 4.0 | Dean's List 2019-2021 (top 10%)
- Accomplished Coursework: Compilers, Algorithms, Operating Systems, Computer Networks, Database Management Systems, UI/UX Design, Artificial Intelligence, Linear Optimization, Probability Theory, Discrete Mathematics, Linear Algebra, Calculus, etc.

Skills

- **Programming Languages:** Python3, C/C++, Java, JavaScript, R
- **Frameworks:** React.js, Bootstrap, Django, Flask, Node.js, gRPC, PostgreSQL, MongoDB
- **Developer Tools:** Linux, Git, Jenkins, Docker, Vim, Jetbrains

Work Experience

Undergraduate Teaching Assistant for Computer Graphics Jan 2022 - Present
University of Wisconsin-Madison

- Hosted office hours to answer Computer Graphics questions regarding graphics concepts (e.g. transformations, curves, meshes, shaders, ray tracing, etc.) and APIs (e.g. Canvas, SVG, glMatrix, GLSL, WebGL, Three.js, etc.) for 7 hours each week.
- Updated the course's website using the **Hugo framework** and **Github Action's CI/CD workflow**. Peer-reviewed and debugged bi-weekly student workbooks using the **Node.js** framework in JavaScript.

Machine Learning Engineer, Part-Time Internship Jan 2022 - Apr 2022
EasyJobs Startup

- Architected a RESTful real-time resume parsing service that leverages OpenAI's Natural Language Processing engine GPT-3 by using **Django**, **PostgreSQL**, and **OpenAI API**.
- Integrated this new service into the company's micro-service framework by using **Docker**. Updated **Jenkins' CI/CD workflow** to smoothen deployment and improve fault tolerance for the new service.

Data Engineer, Full-Time Internship Jun 2021 - Aug 2021
Teradata

- Worked with a world-top commercial bank and was responsible for both improving the ETL routine of the Data Warehouse using **Perl** and **Bash script** and performing custom data extraction tasks using **Teradata-SQL** and **DSQL** for **fraud detection**.
- Led the communication, demand analysis, and SQL development for a complex data extraction task requiring joining more than 20 tables across 2 databases. Wrote peer-reviewed SQL and communicated with the operation team to ship the data in time.

Research Experience

Vision-Based Real-Time Motion Capture System on Edge Device Jan 2022 - Present
Research Assistant supervised by Prof. Yu Hen Hu Madison, WI

- Wrote research proposal about real-time 3D motion capture systems on edge devices based on the critical observation that 3D temporal consistency can be used to compensate more noisy 2D information for lower FLOP and higher FPS.
- Developed and deployed a light-weight 3D Human Pose Estimation pipeline on **Jeston Nano** that integrates YOLOv5, HRNet-Lite, and VideoPose3D using **Docker** and **TensorRT** and improved FPS by weight quantization and CNN channel pruning.

Synthetic Pretraining for Robust 3D Human Pose Estimation Jan 2021 - Present
Research Assistant supervised by Prof. Yin Li Madison, WI

- Synthesized realistic 2D keypoints to pretrain 3D estimators, showing a significant decrease of PA-MPJPE from 68.0 mm to 61.3 mm on the 3DPW dataset compared with the pretrained-with-H36M baseline. **Served as the 3rd author** for the journal paper *Learning from Synthetic Humans for Accurate and Generalizable 3D Pose Estimation* targeting **IEEE Transactions on Image Processing.**
- Spearheaded the development of a graphic rendering pipeline that infers human mesh from 3D human joints and shape, and calculates dense depth maps with respect to sampled camera views by using **OpenGL**, **Pytorch**, and **Scipy**.

Vision-Based Job Risk Assessment System for Manual Material Handling Sep 2020 - Jan 2021
Research Volunteer Madison, WI

- Collaboratively proposed a non-intrusive, visioned-based system to estimate the Body Asymmetry Angle by using pre-trained 3D Human Pose Estimators. **Served as the 3rd author** for the journal paper *A Single-Camera Method for Estimating Lift Asymmetry Angles using Deep Learning Computer Vision Algorithms* targeting **The Journal of the Human Factors and Ergonomics Society.**
- Verified experiment results by setting up and running 6 human pose estimation methods on Unix-based OS with **Docker** and **Anaconda** and showed that our method produces statistically more accurate results than the previous SOTA by using the paired t-test.

Project Experience

University Ranking By GitHub Contribution Feb 2022
https://hxu296.shinyapps.io/g-index/

- Developed and published an R shiny App that ranks U.S. academic institutions according to their public contributions on GitHub. Used **ggoplot2** visualizations to tell interesting stories about universities, repositories, and their committers.
- Wrote SQL to extract 140k rows of unique GitHub committer information from **Google Big Query**'s public data warehouse "github-repos" and transformed raw data into a tidy structured format in **R** using **tidyverse**, **dplyr,** and regular expression.

Hongyuan Displays (WeChat Mini-Program) Sep 2021

- Developed a WeChat mini-program that allows users to search, browse, and share office supply products from Ningbo Hongyuan Electronic Technology Co. using **React.js** and **Bootstrap** in **JavaScript.**
- Paired the mini-program with a background management website where administrators can create, update, and delete products constructed with **React.js** and **Express.js**.

Stock Drop Notifier Dec 2020

- Built a customizable stock notifier for Newegg and BestBuy with a Telegram command-line interface that allows users to personalize search filters, fire up notifiers, and receive notifications all through 1 Telegram bot account by using **Scrapy**, **Selenium**, **BeautifulSoup**, **Regex**, **Requests**, and the **Python-Telegram-Bot API**.
- Deployed the bot to a Raspberry Pi 4 and purchased 3 Nvidia 30 series GPUs in 1 month with its assistance.