

Yankun (Alex) Meng

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EDUCATION

DUKE UNIVERSITY

Bachelor of Science in Electrical & Computer Engineering and Computer Science

Durham, NC

August 2023 – May 2025

Transferred from Stony Brook University Computer Science and Physics (2021 – 2023)

GPA: 3.9/4.0

Relevant Coursework: Machine Learning, Deep Learning, Advanced Algorithms, Computer Architecture, Data Structures, Linear Algebra, Probabilities, Differential Equations, Computer Vision, Signal Processing, Control Systems

ROSLYN SECONDARY SCHOOL

Graduated with High Honors in Science and Math

Long Island, NY

August 2014 – June 2021

HONORS AND AWARDS

- Dean's List with Distinction 2023–2025
- Duke–Harvard Live AI Hackathon Global Winner in Artificial Intelligence ([Devpost](#)) 2024
- Microsoft Global Imagine Cup Competition Semi-Finalist ([Demo](#)) 2024
- Duke–OpenAI Generative AI Hackathon Winner ([Devpost](#)) 2023
- Global Excellence Scholarship 2022

RESEARCH EXPERIENCE

Simons Foundation Polymathic AI Initiative

Summer Research Intern (Advised by Dr. Aaron Watters)

New York City, NY

May 2024 – August 2024

- Collaborated with world leading scientists on publishing **The Well**: a pioneering, large-scale 15TB dataset of numerical simulations aimed at accelerating scientific breakthroughs. ([Publication](#))
- Designed and implemented **GPU-accelerated visualization pipelines** for numerical simulations using **WebGPU**, significantly enhancing real-time simulation by two-folds, enabling intuitive **3D visualizations**
- Produced high-quality, public-facing animations for each dataset in The Well, broadening accessibility and engagement with this unique resource.

Duke University Intelligent Interactive Internet of Things (I³T) Lab

Independent Study Student (Advised by Dr. Maria Gorlatova)

Durham, NC

August 2023 – Present

- Developed and constructed virtual reality-based **augmented reality** guidance system for retinal laser therapy
- Fabricated and developed the architecture for a virtual **digital twin** of magnifying lens and environment using **GaUnity**, **Gaussian Splatting**, **Blender** for 3D Modeling, and **C#** GPU shaders
- Devised a custom magnification **algorithm** based on the lens formula and Unity Ray Casting, evaluated 95% accuracy on **Microsoft HoloLens 2**, won top 5 poster prize at **Duke Undergraduate Research Symposium**

Duke University Medical Center Radiation Oncology Lab

Undergraduate Research Assistant (Advised by Dr. Anna E. Rodriguez)

Durham, NC

August 2023 – May 2024

- Title: Automatic Measurement of Human Body Dimensions for Total Body Irradiation
- Devised custom computer vision algorithm to measure human body dimensions from a photo, including image segmentation **transformer** and **pose estimation**, packaged algorithm as a **Flask backend API** and deployed for use on **Google Cloud Run**, invited to speak at **2024 Duke Muser Flash Talks**

Stony Brook University Computer Vision Lab

Undergraduate Research Assistant (Advised by Dr. Haibin Ling)

Stony Brook, NY

September 2022 – June 2023

- Title: Exploring Privacy Risks of Mobile Augmented Reality Applications
- Designed system to **promote visual data privacy** in Mobile AR Apps – minimize the ability for developers to conduct vision operations behind the scenes without the user's consent
- Monitored App power consumption under several controlled environments using **Battery Historian**, **TensorFlow**, and **Python** - found that malicious face detection apps consume 60% more power than usual on average

Stony Brook University Computer-Aided Design and Innovation Lab

Undergraduate Research Assistant (Advised by Dr. Anurag Purwar)

Stony Brook, NY

Jan 2022 – June 2022

- Title: Machine Learning Assisted Joint Tracking and Classification
- Replicated **PoseNet** Neural Network to estimate and predict relative locations of human joints, with applications in gesture controlled bluetooth cars or sign-language application
- Trained Yoga Pose recognition model on-the-web – Extracted 33 keypoints into csv using Python, used **Javascript** to obtain joint positions using Blazepose and the PoseNet Algorithm

TEACHING EXPERIENCE

Duke University Department of Electrical and Computer Engineering

Durham, NC

Undergraduate Teaching Assistant

August 2023 – Present

- Led Office Hours for over 300 students total in Fundamentals of Electrical Engineering, Signals and Systems, Microelectronics, and physics classes. Delivering instructions on topics involving signal processing, circuit analysis, algorithms, socket and parallel programming, MATLAB, and computational modeling and simulation

SELECTED PROJECTS

EVA: AI Personalized Digital Fashion | *Startup Co-Founder* ([App Store](#))

June 2023 – Present

- Collaborated with 4-member technical team from Cornell and Duke to establish a startup enabling users to capture clothing images, curate digital wardrobes, and receive personalized styling suggestions
- Conducted thorough literature review on CVPR, SIGGRAPH, replicated state-of-the-art **3D graphics** [Garment3DGen](#) Architecture from Meta Reality Lab using **PyTorch3D**, [OOTDiffusion](#) model for 2D Virtual Try-on, and [Segmentation Transformer](#) for clothing capture from an image
- Engineered a data processing REST API with **Flask** and **Firestore database**, tested endpoints with Postman, migrated backend to **Google Cloud**, integrating virtual **GPU and CUDA** for accelerated deep learning computations and secured **\$2000 funding from Google**

Graphically Modeling Text Coherence for Automated Essay Scoring ([Website](#)) ([Demo](#))

Fall 2023

- Replicated and Improved upon state-of-the-art argument mining and NLP in automatically scoring essays through complex **feature engineering** with **Stanford CoreNLP in Java** and parsing argument microstructures
- Successfully trained **conditional random field (CRF)** for sentence parsing and **support vector machines (SVM)** for stance recognition in **Python**, which improved identification accuracy and scoring correctness by 55%
- Optimized relations in constructed arguments using **Integer Linear Programming (ILP)**, improving argument relation classification results by two-folds, pushing the boundaries of automated essay scoring for persuasive essays

BunnyBot: AI-Powered Alzheimer Preventive Robot | *2024 Microsoft Imagine Cup* ([Demo](#))

Spring 2024

- Conducted literature review and trained Alzheimer Detection **machine learning model** based on word repetition
- Implemented **Azure IoT Hub** for mobile-robot communication and **Azure Cognitive Services** for Speech to Text conversion, designed **flagging system** to alert health professionals if alzheimer's symptoms is detected

ReAnimate: Bring Learning to Life with Augmented Reality ([Github](#)) ([Youtube](#))

Fall 2022 – Spring 2023

- Startup project inspired by hard-to-read textbooks – Committed to enhance textbook learning using AR
- Implemented dynamic iOS App with **Model-View-Controller Architecture** for using **ARkit** and **Swift**, performed **UI/Integration/Unit tests** in Xcode with 95% code coverage
- Presented IOS Demo to 5 professors and at SBUHacks 2022 and received **Education Track Winner**

Talk-with-Me: AI Language Learning | *2023 OpenAI & Microsoft Hackathon Winner* ([Devpost](#))

Nov 2023

- Developed Natural Language Processing Chrome Extension designed for Language speaking and learning with **Microsoft Azure Speech API** and created frontend with **HTML/CSS/JavaScript** and backend with **Flask**
- Stored time-series user data and learning trend with **MongoDB** and performed visualizations with **Matplotlib**

Jeux: Multithreaded Network Game Server in C | *Socket Programming, POSIX threads* ([GitHub](#))

April 2023

- Implemented network protocol for socket programming in **C** over the **TCP/IP** stack, ensuring seamless interaction between the game server and clients through a well-defined packet format and message exchange rules
- Successfully implemented reference counting and thread safety with **locks, mutexes, signals, and semaphores** to synchronize operations, mitigating **race conditions** for seamless coordination among server threads
- Unit tested with **Criterion** achieving 90% code coverage, optimized and tested with stress tests using **JMeter** with up to 500 simultaneous connections while maintaining a responsive user experience

LEADERSHIP AND ACTIVITIES

- Robotics Team** Software Team Lead / 2022 SBU Battle Bot Competition Winner (programmed with C++)
- Volunteer** at [ACM SIGKDD International Conference on Knowledge Discovery and Data Mining](#)
- Latin Dance** Champion 1st Place at Manhattan Dancesports / NBA Brooklyn Nets Halftime show performer
- Choreographer** for Duke Club Ballroom Dance, Stony Brook Ballroom Dance Team, and KBS Dance Team
- Host fluent in English and Chinese** / press conference **translator** for NY Senator Brian Kavanagh