# Qianheng Xu

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## EDUCATION

**Cornell University** *Ithaca, NY*
*Computer Science & Linguistics* *Expected Graduation 2030*
**Millburn High School** *Millburn, NJ*
*Graduating Honors Class of 2026* *Sept. 2022 – June 2026*

## RESEARCH

**StutterZero & StutterFormer: End-to-End Speech Correction for Stuttering** *Sept. 2024 – Present*

- Developed encoder-decoder and Transformer models using Pytorch to transcribe and correct stutters from speech signals
- Introduced & published the first end-to-end model for stutter correction, US Utility Patent #19/288,365 under review
- https://ieeexplore.ieee.org/document/11288978
- github.com/justanotherinternetguy/StutterZero

**XSpeech: Multi-Branch Learning for Multi-Class Stuttering Classification** *Sept. 2023 – April 2024*

- Built CNN-LSTM multi-branch model using Tensorflow to classify and diagnose stuttered speech
- Published in the National High School Journal of Science
- github.com/justanotherinternetguy/XSpeech

**$\mu$Lang – Generating a Morphologically Average Conlang Lexicon** *June 2025*

- Explored genetic, evolutionary, and neural algorithms to generate and simulate linguistic evolution
- Published on Wolfram Community
- Invited to speak at Wolfram Technology Conference 2025

**Characterizing Percussive Damage in Fossil Wood** *Sept. 2023 – June 2025*

- Applied VGG16/19, ResNets & Haralick texture features to identify and classify damage on fossil wood samples caused by primate tools
- Linked results to archaeology, bridging primatology with computational analysis
- Co-authored primatology/archaeology study under professor mentorship

## PROJECTS

**SignSensei** | *Python, Mediapipe, Tensorflow, OpenCV, Streamlit* | github.com/SignSensei *2023*

- Developed a web application to gamify learning American Sign Language (ASL)
- Built and trained a custom Tensorflow ML model for hand pose detection and classification
- Awarded the Wolfram Award at PennApps 2023 (Top 20 projects)

**Sen_deX** | *Python, Electron, Pytorch, Transformers, Flask, Supabase* | github.com/sen_dex *2025*

- Built a full-stack application to predict trends in research
- Implemented innovative embedding analysis, inverse embedding, and clustering algorithms
- Awarded the Best Educational Hack at PennApps 2025

## WORK EXPERIENCE

**Sync Labs** *University of Pennsylvania*
*Software Engineering/AI Intern* *June. 2024 – Sept. 2024*

- Led development of facial and action recognition models (FaceNetV2, MoViNet) to provide personalized health information (exercise, diet, nutritional intake) for residents in senior homes
- Fine-tuned and deployed CV models and LLMs on Raspberry Pi IoT devices

## Awards & Honors

**1st Place Grand Award – International Science and Engineering Fair** | *Computational Biology*    *May 2025*

**1st Place – New Jersey Academy of Science** | *Health & Medicine*    *May 2025*

**ISEF Grand Prize – Terra North Jersey STEM Fair** | *Bioinformatics*    *March 2025*
- Placed top 6 out of 200+ projects
- 1st Place Bioinformatics Award (2025)
- Regeneron Biomedical Science Award
- Karen Kranz Memorial Award

**Semifinalist & Honorable Mention – USA Biology Olympiad** | *Top 5-10% nationally*    *2023, 2024*

**Gold – British Biology Olympiad** | *Top 5% internationally*    *2024*

**Finalist – American Computer Science League** | *Top 5%-10% nationally*    *2023*

**First Tech Challenge Robotics** | *Team #8405 & #23650*    *2023*
- Inspire Award (2025)
- Control Award (2024)
- Innovate Award (2023)

## Technical Skills

**Languages**: Python, Java, C/C++, SQL (Postgres), JavaScript, Wolfram Mathematica, Shell Scripting
**Technologies**: Linux, Pytorch, Tensorflow, Next.JS, Firebase, Supabase, Flutter
**AI/ML**: Deep Learning (CNNs, LSTMs, Transformers), Time-Series Analysis, Audio Processing, Computer Vision, NLP
**Skills**: Data Science, Computational Modeling, Full-stack Web Development, Autonomous Robotics, System Administration

## Leadership & Volunteering

**Conlang Club** | *Founder & President*    *2023 – Present*
- Founded club to explore constructed languages (Quenya, Klingon, Dothraki, etc.) and applied linguistics
- Grew membership from 10 to 40+ in two years
- Co-founded *Verborum*, the first high school–only linguistics magazine; recruited submissions from 4+ countries and personally edited 10+ articles out of 60+ collected

**HackMHS VIII, IX, X, XI** | *Co-organizer*    *2023 – Present*
- Organized NJ's largest high school hackathon (100+ participants annually)
- Built hackmhs.com, secured sponsors, acquired Bambu 3D printers, ran workshops and technical talks
- Fostered an inclusive hackathon community, leading logistics and outreach

**Teaching Assistant** | *USA Biolympiad Prep*    *2024 – 2025*
- Mentored high school biology students through weekly lectures, office hours, and custom practice exams
- 13/60 students taught advanced to USABO Semifinals

**Wolfram Student Ambassador**    *2024 – 2025*
- Mentored OneHacks V hackathon (200+ participants)
- Answered questions virtually, gave technical talks and workshops on data science and the Wolfram Language

**Scratch Instructor** | *Millburn Institute of Talent*    *2022 – 2023*
- Designed and taught Scratch CS curricula to elementary/middle schoolers
- Boosted program revenue by $4k+

**Robotics Summer Coach** | *West Caldwell Tech*    *2023*
- Taught robotics and CS to 100+ underserved middle schoolers in 3-week summer camp