

# Mannat Vikramaditya Jain

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## EDUCATION

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- 2025  
(current)      **Garden City High School, New York**
- GPA: Weighted: 100.10, Unweighted: 96.28.
  - SAT: 1570 (800 Math; 770 EBRW), PSAT: 1500.
  - 18 APs, including AP CS A, AP Calc BC, AP Chem, AP Physics C, AP Statistics, etc., and secured 5's.
  - Semifinalist, 2025 National Merit Scholarship Program.
- 2024-25      **Harvard Extension School, Harvard University, Cambridge, MA**
- MATH E-21A, Multivariable Calculus, Fall 2024
  - MATH E-21B, Linear Algebra, Spring 2025
- 2023-25      **Columbia University Science Honors Program, Columbia University, New York**  
Weekly, In-Person Classes at Columbia Engineering campus in Data Science, Algorithms & "R" Language. Entry via competitive exam.
- 2024-25      **Department of Biomedical Informatics, School of Medicine and College of Engineering and Applied Sciences, Stony Brook University, NY.** Summer program, continuing through senior year.

## RESEARCH PAPERS AND EXPERIENCE IN BIOLOGICAL AND BIOMEDICAL ENGINEERING

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- 2024-25  
(in-progress)      **Duke University School of Medicine, Duke University, North Carolina**
- *First author* on a paper with Chairman, Department of Bioinformatics and Biostatistics, using Protein Language Models to discover novel synthetic restriction enzymes.
  - *Co-author* of a paper on using DNA computers to accelerate cancer research.
- 2024-25  
(submitted to  
SCCM Journal)      **MIT Lab for Computational Physiology & Society of Critical Care Medicine Congress (SCCM), Chicago**
- *Second author* on paper establishing the relationship between ICU documentation and mortality;
  - Only high-school student invited to compete alongside a team of seven leading researchers and clinicians at SCCM's International Discovery Datathon to quantify disparities and understand hidden drivers of bias.
  - Selected to represent the team and present at the International Society of Critical Care Medicine Congress in Orlando in February 2025.
- 2024  
(in-progress)      **School of Medicine & College of Engineering & Applied Sciences, Stony Brook U., NY**
- *First author* on a paper with Dr. R. Davuluri, Director of Graduate Program for Biomedical Informatics.
  - Training DNABERT to identify A2I RNA editing sites in pre-mRNA

## PATENTS PENDING

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- 2024**  
*Utility – Prov.  
Application  
under 35 USC  
111(b); 3007; #  
66555092*
- PATENT PENDING:** *Artificial Intelligence Based, Bi-Directional, Customizable Platform For Real-Time Translation Of Any Sign Language To Any Spoken Language*  
The Present Invention relates to the field of language translation, specifically to a system and method for real-time translation of American Sign Language (ASL) to multiple global languages. This invention aims to bridge the communication gap between ASL users and non-speakers and facilitate seamless interaction.
- 2024**  
*Utility – Prov.  
Application  
under 35 USC  
111(b); # 2622*
- PATENT PENDING:** *AI-Driven Real-Time Search Index for Educational Platforms*  
The present invention relates to educational technology, specifically a software application that leverages artificial intelligence (AI) to create a real-time search index for Google Classroom. The invention enables students to locate relevant documents, materials, and assignments to specific topics, enhancing productivity and learning outcomes in digital educational environments.

## AWARDS AND HONORS: International and National Awards

Semi-Finalist; International Competition. Winners TBD	<p><b>Ellison Scholar, Undergraduate Program (Health &amp; Medical Science), University of Oxford</b></p> <ul style="list-style-type: none"> <li>- Awarded \$125,000/yr., multi-yr. stipend for study at the University of Oxford</li> <li>- Selected to focus on “scientific and technological innovation in health and medical science, and translating research and discovery into practical solutions, and scaling these for global impact.”</li> </ul>
Finalist; International Essay Prize	<p><b>John Locke Essay Competition; Finalist from among 35,000 global contestants, 2024</b></p> <ul style="list-style-type: none"> <li>- Finalist in the Global Essay Competition organized by the John Locke Institute, Oxford University</li> <li>- Subject of Essay: “What is the Optimal Global Population?”, Economics Category</li> <li>- Invited to London for the awards ceremony in September ‘24.</li> </ul>
First Prize, International Datathon	<p><b>Winner, Society of Critical Care Medicine 2024 International Discovery Datathon, Chicago, 2024</b></p> <ul style="list-style-type: none"> <li>- Core member of the team that won first prize in the Health Equity and Diversity Category for an analysis of ethnic biases in ICU treatment using the eICU-CRD database;</li> <li>- Selected to present at the International Society of Critical Care Medicine Congress 2025, Orlando, FL.</li> </ul>
International Science Champion Award, USAID, ISEF	<p><b>US Agency for International Development, International Science Champion Award, 2024</b></p> <ul style="list-style-type: none"> <li>- “USAID presents the Science for Development Award to recognize innovative student projects in science and technology...(to) advance...ability to meet current and future development challenges.”</li> <li>- Award received for developing DL Algorithm to identify Regions of Interest in fetal ultrasounds (Intersection over Union = 0.82) to detect fetal lung immaturity, which causes more than a million neonatal deaths in low-resource countries.</li> </ul>
National Technology Award	<p><b>Congressional App Challenge, First Prize, 2023-2024</b></p> <ul style="list-style-type: none"> <li>- The Congressional App Challenge is an official initiative of the U.S. House of Representatives. It “is the most prestigious prize in (America) in student computer science.”</li> <li>- 374 winners from among 11,334 contestants from 374 congressional districts in the US.</li> </ul>
National Presidential Award for Service, Gold	<p><b>AmeriCorps Presidential Volunteer Service Gold Award, Washington DC, 2024</b></p> <ul style="list-style-type: none"> <li>- Awarded the US' highest award for youth volunteer service: AmeriCorps Presidential Volunteer Service Gold Award by the President of the United States.</li> <li>- Recognized by the Mayor and New York press (GC News, Garden City Living, and Newsday) as positively impacting 1/3rd of the population</li> </ul>
National Award Gold	<p><b>Premio de Oro, National Spanish Exam, 2023</b></p> <p>Awarded Gold in 2023; 99th percentile</p>

## AWARDS AND HONORS: State and Regional Science and Technology Awards

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April 2024, 23	<p><b>Grand Award Winner (2<sup>nd</sup> Prize), New York State Science and Engineering Fair</b></p> <ul style="list-style-type: none"> <li>- 2<sup>nd</sup>/400 in the Computational Biology and Bioinformatics category for Fetal Lung Maturity project</li> <li>- 3<sup>rd</sup> Prize, Awarded for graph neural network-based ASL to text translation project</li> </ul>
April 2024	<p><b>Grand Award Winner (2<sup>nd</sup> Prize), Long Island Science and Engineering Fair</b></p> <ul style="list-style-type: none"> <li>- 2<sup>nd</sup>/130 in the Computational Biology and Bioinformatics category for Fetal Lung Maturity project</li> </ul>
2024	<p><b>Regional Finalist, Junior Science and Humanities Symposium (JSHS)</b></p> <ul style="list-style-type: none"> <li>- 3<sup>rd</sup> in Mathematics and Computer Science category for Fetal Lung Maturity Project</li> </ul>
2023	<p><b>Finalist, New York State Science Congress</b></p> <ul style="list-style-type: none"> <li>- Awarded by the Long Island STEM Education Leadership Association for Excellence in STEM</li> <li>- Best in Physics, awarded for graph neural network-based ASL to text translation project.</li> <li>- <u>Highest Honors</u>: Long Island Science Congress</li> </ul>
2024, 2023	<p><b>Humanities in Science Award x2, SAAWA</b></p> <ul style="list-style-type: none"> <li>- 1st, STEM category, for Fetal Lung Maturity Project, SAAWA</li> <li>- Awarded in 2023 and 2024 for Fetal Lung Maturity project and graph neural network-based ASL to text translation system</li> </ul>

- 2024 **Think Award, Vex Robotics Competition**  
 “Most effective use of coding techniques and programming design to solve the game challenge”
- 2021 **FRC Rookie Game Changer Award, FIRST**  
 International Award to “celebrate a rookie team’s outstanding success.” Lead programmer on FRC Team Bravesolders (#8582)

### AWARDS AND HONORS: Other Academic Awards

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- 2024, 2023 **AP Scholar With Distinction x2, College Board**
- 2024 **Gold Medalist x2, Al Kalfus Math Fair**  
 Awarded in 2023 for the 3-body-problem project and 2024 for an odometry project; Al Kalfus Math Fair has >900 participants annually.
- May 2024 **Excellence in Science Research Award x2, Garden City High School**  
 Awarded in 2023 and 2024 for being the only student in the school to receive Grand Awards at the New York State Science and Engineering Fair twice
- 2023 **Medalist, Science Olympiad**  
 Placed at the Nassau West Regional Science Olympiad in the category of Fermi Questions

### NON-ACADEMIC AWARDS AND HONORS: Leadership and Outreach Awards

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- 2024 **New York State Senate Youth Leadership Recognition Award, NY**
- Awarded by New York State Senator Kevin Thomas for “attaining outstanding achievement and serving as a leader and positive role model in the community.”
  - Received a Proclamation from NY State Senate
- 2023 **Adelphi University Prize for Leadership, Garden City, NY**
- Awarded to juniors for exemplary achievement and community service; received \$1000 in prize money, Adelphi library privileges, and tuition-free courses

### PROJECTS: Biological and Biomedical Engineering

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- 2024 (submitted to SCCM Journal) **Lead Analyst, eICU-CRD Database, Society for Critical Care, Chicago. Won First Prize.**  
 I analyzed the eICU-CRD database to determine the relationship ICU documentation and actual mortality and discovered ethnic biases in ICU treatment in Midwest areas (after adjusting for illness severity)—  
*Won First Prize at SCCM’s International Discovery Datathon, Chicago, 2024.*
- 2024 (in progress) **Developed Protein Language Models for DNA Computing, Duke University School of Medicine**  
 Used Protein Language Models to discover novel synthetic restriction enzymes; currently modeling the enzymes with AlphaFold 3 to assess viability
- 2023-25 (provisional patent received) **Developed a Deep Learning Algorithm and Created a 50:50 Joint Venture with Asia’s Leading Hospital to Identify Hypertrophic Cardiomyopathy in Non-Standard Cases in Low-Resource Countries**
- Wrote code in PyTorch to create a novel hybrid DL U-Net and ‘You Only Look Once’ model to identify regions of interest in fetal ultrasounds (Intersection over Union = 0.82).
  - Deep-learning algorithm re-purposed for a 50: 50 joint-venture with one of Asia’s largest hospital networks to identify HCM in non-standard cases (obesity, diabetes, etc.)
- 2024 (in progress) **Trained DNABERT to identify A2I RNA editing sites in pre-mRNA, Stony Brook University**  
 Sourced data from REDportal hg38 genome sequence; trained DNABERT on data to identify A2I RNA editing sites in pre-mRNA; currently analyzing high-attention regions to determine chemical motifs affecting alternative splicing

### PROJECTS: Computer Science And Robotics

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- 2023-25  
(provisional patent received)      **Launched Non-Profit for A.I. Ed-Tech in NY;**
    - Designed and built a novel search engine that *won the national Congressional App Challenge 2024*.
    - Working with NY-04 Congressman D' Esposito to launch app as a non-profit in schools across NY.
    - Invited to represent NY-04 Congressional District in the Annual Congressional Hackathon, DC.
  
  - 2022-23  
(provisional patent received)      **Graph Neural Network-Based ASL-To-Text Translation System; Launched Non-Profit in Asia**
    - Wrote code in TensorFlow to develop a novel ASL-to-text translation system that merged Graph Neural Networks and Transformer architecture for real-time translation of ASL to multiple languages
    - Launched OneMudra.Com, a non-profit translator app impacting > 1,000 students in India.
  
  - 2023-24      **V5RC Robotics Code for Team 68602A; Won First Prize for Best Software in Competition**
    - Wrote the code for V5RC Team 68602A in C++; implemented Kalman filters, Monte Carlo localization, and Reinforcement Learning algorithms from scratch
    - Won First Prize for Best Software at Farmingdale State Qualifier
  
  - 2021-22      **A Novel Search Engine for Wikipedia; Won Multiple Science Awards in NY**
    - In freshman year, wrote code in JavaScript to create a natural language processing-based search engine
  
  - 2021      **FRC Robotics Software and Website**  
Wrote the code for the robot for FRC team BraveSoldiers (#8582) in Java; developed the team's website (React)

## LEADERSHIP, VOLUNTEER AND SPORTS

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- 2022-24      **Founder, Chess4Community, Garden City, NY**  
Founded and led Chess4Community, my town's first-ever chess program for cognitive development for senior citizens and children in elementary and middle school. Arranged town-wide events to teach chess; ran multiple year-long programs at the Garden City Senior Center and the library; organized tournaments where the mayor and high school principal distributed prizes.
  
- 2023-24      **Founder and President, Bioinformatics AI Club, Garden City High School, NY**  
Founded the first Bioinformatics-AI Club, dedicating significant time and effort to its growth. Organized lectures by CEOs of cutting-edge biotech companies and researchers from Harvard-MIT HST, Johns Hopkins, Rockefeller, et al. Taught AI fundamentals, RDKit for chemistry, DeepChem for molecular design, and bioinformatics. Mentored younger students for science competitions and participated in mock juries.
  
- 2022-24      **High School Clubs:**
  - Robotics Club, Treasurer: Led recruitment that tripled membership and raised \$6000.
  - Chess Club, Vice President: Started a program to travel to elementary and middle schools to teach chess
  - Literary Circle, Member: Biweekly meetings to discuss nonfiction and its impact on modern society
  
- 2022-2024      **Tennis, JV/Varsity; FIDE/USCF Rated Chess Player (Peak Rating 1813)**

## INTERNSHIPS

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- 2024-2025      **Department of Biomedical Informatics School of Medicine and College of Engineering and Applied Sciences, Stony Brook University, New York**  
Working with Dr. Davuluri, Director, Biomedical Informatics, Stony Brook University, NY, to train DNABERT to identify A2I RNA editing sites in pre-mRNA. Sourced data from REDI portal hg38 genome sequence; trained DNABERT to identify A2I RNA editing sites; currently analyzing high-attention regions to determine chemical motifs that affect alternative splicing.
  
- 2022      **Central Square Foundation (*Financed by Bill and Melinda Gates Foundation*), New Delhi**  
Central Square Foundation (CSF) is a non-profit focused on enhancing educational learning outcomes in India through system-led reforms in education policy. I conducted primary field research and developed a post-pandemic, ed-tech initiative for low-income segments that could create an at-scale impact by being accessed by a hundred million poor households.

## LANGUAGES & CERTIFICATIONS

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First Language: English

Second Language: Hindi

Foreign Language: Spanish

Computer: React • Python • PyTorch • Java • Rust

2024-2025	<b>A.I. in Healthcare, Stanford School of Medicine Online</b>
2024	<b>Data or Specimens Only Research, MIT Affiliates CITI Training</b>
2024	<b>Conflicts of Interest, MIT Affiliates CITI Training</b>
2023	<b>John Hopkins Biomedical Engineering Innovation, Maryland</b> Modeled biological systems and designed experiments to test computational models; earned three college credits from Johns Hopkins University
2022	<b>Cold Spring Harbor DNA Learning Center, New York</b> DNA Science (June 2022), DNA Barcoding (June 2023); worked with BLAST and modern bioinformatics tools; published new sequences to National Institutes of Health GenBank
2016-22	<b>John Hopkins Center for Talented Youth, Maryland</b> Zero to Infinity (2016), Physics of Engineering (2017), Inductive and Deductive Reasoning (2018), Writing Your World (2019), Algebra I (2020), AP CS A (2021), Advanced Physics (2022)

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