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Graduate MSIS student with a background in Neuroscience and Computer Science. My work sits at the intersection of user-computer interaction, neural networks, and human-centered architecture. Proven record of interdisciplinary research, cross-functional leadership, and accessible technology solutions. Experienced in ML model interpretation and evaluation, data visualization, full-stack web development, and communicating complex concepts--translating technical insights into actionable design decisions. Seeking opportunities in HCI, UX research, AI/ML, and/or data-driven project management.

EDUCATION

University of North Carolina at Chapel Hill (UNC-CH)

M.S. in Information Science

Chapel Hill, NC | Jan 2026 - May 2027

Relevant Coursework: Human Information Interactions, Open-Source Intelligence, Health Informatics Seminar, Ethics Values & Society, AI Law and the Struggle for Knowledge.

B.S. in Information Science and Neuroscience, Minor in Computer Science

Chapel Hill, NC | Aug 2022 - Dec 2025

School of Information and Library Science (SILS). BS-MS Dual Degree Program.

GPA: 3.43 **Activities and societies:** UNC School of Information and Library Science (SILS) - Ambassador & New School Student Advisory Board; UNC Girls Who Code (GWC) - College Loop President, Facilitator, TA, and Public Outreach Committee Member; UNC Zero Degrees - Co-President; UNC Women in Computer Science (WiCS) - Website Project team; Pearl Hacks Hackathon - Volunteer & Awardee.

Relevant Coursework: Systems Programming, Data Structures, Discrete Math, AI Literacy, Multivariable Calculus, Statistical Methods, Neuropsychopharmacology, Organic Chemistry II, Health Application Development.

North Carolina School of Science and Mathematics (NCSSM)

Durham, NC | Aug 2020 - May 2022

Weighted GPA: 4.85 **Activities and societies:** Research in Chemistry and Molecular Genetics. Girls Who Code Chapter - Co-founder and President. Technology Student Association (TSA) - President ('21-'22), Secretary and Junior Officer ('20-'21). Broad Street Scientific Journal - Editor-In-Chief ('21-'22), Chemistry Editor ('20-'21). Student Government - Fully Remote Dorm Senator. Mock Trial competitor. Speech and Debate - Captain. National Beta Club. SMath Tutors. NCSAS State President-Elect.

Girls Who Code (GWC) Summer Immersion Program (SIP), Bank of America

Charlotte, NC | July 2020

1 of 20 participants selected globally to study Python, Java, and game design. Introduced to team-based software engineering and front-end UX concepts. Developed a BuzzFeed quiz and activist toolkit website.

World Science Scholars (WSS) Festival

Charlotte, NC | Jan 2019 - Dec 2022

Selected as 1 of 30 students internationally for advanced interdisciplinary training in mathematics, neuroscience, computational programming, astrobiology, and computer science.

TECHNICAL EXPERIENCE

Eye-Tracking AI Undergraduate Research

Chapel Hill, NC | Sept 2025 - Present

PI: Dr. Fei Yu. **Collaborator(s):** Jaegoo Ha.

- Designed a comparative between-subjects mixed-methods study (n = 20, UNC undergraduates) of **ChatGPT** vs. unaided UNC Library Search (**EBSCOhost/Articles+**) for academic information-seeking, measuring speed, accuracy, source quality, and comprehension during research tasks.
- Integrated **Tobii Nano Pro** eye-tracking, pairing gaze signals with think-aloud protocols. Used labeled interface regions to collect fixation duration, saccade rate, and pupil dilation as cognitive-validity checks alongside behavioral metrics for analysis of visual user attention patterns in adaptive learning tools, informing UX guidelines for AI tools in educational interfaces.
- Constructed post-task survey instruments adapting **Cognitive Load Theory (CLT / DCLQ)**, **System Usability Scale (SUS)**, and statistical methods including **Mann-Whitney U**, **Spearman's rho**, and **mixed-effects regression**.
- Suggested systems implementing query scaffolding workflows, citation verification protocols, a librarian-facing dashboard, and responsible-use framework addressing AI hallucination risks, academic integrity, and AI literacy integration into library instruction workflows. Delivered slide deck, two-page quick-start handout with prompt templates, and screen-recorded tutorial video as training materials.

AI Literacy Independent Study

Chapel Hill, NC | Aug 2025 - Feb 2026

PI: Dr. Fei Yu.

- Executed a PRISMA-guided systematic review across 6 major bibliographic databases and 4 preprint servers with backward and forward citation chasing, studying how large language models influence human communication.

- Developed and applied a structured data extraction and **five-lens conceptual** quality appraisal framework capturing study design, communication context, LLM exposure mechanism, linguistic features, and trust/authenticity outcomes.
- Integrated micro-level linguistic shifts with macro-level social implications; produced a preliminary evidence map surfacing gaps and methodological weaknesses. Results show concentration in text-based settings and gaps in spoken-language and secondhand-diffusion research.

Brain-Computer Interface (BCI) Model Card – DREAMS Framework Evaluation *Chapel Hill, NC | Jul - Dec 2025*

PI: Dr. Raghavendra Pradyumna Pothukuchi. **Collaborator(s):** Disha Kohal Math.

- Built end-to-end EEG classification pipeline in TensorFlow/Keras/MNE, training three CNN architectures (EEGNet, DeepConvNet, ShallowConvNet) on the bigP3BCI P300 dataset; generated performance metrics, balanced accuracy, confusion matrices, uncertainty estimates, and training curves across 114 EEG channels at 256 Hz.
- Generated and evaluated DREAMS-inspired model cards using a 13-item System Explainability Scale (SES) across Understandability, Trust, and Usability; documented preprocessing, hyperparameters, and limitations under real-world noisy EEG conditions; findings revealed DREAMS requires substantial pipeline refactoring to integrate into custom workflows. Published reproducible artifact and model card documentation to Google Drive and GitHub.

Health Chart App – Health Informatics Special Topics

PI: Jonathan Tweedy.

- Built a JavaScript-based health chart interface using Leaflet and AJAX to display patient vitals and clinical trends in an intuitive, accessible interface.
- Implemented Fast Healthcare Interoperability Resources (FHIR) API for Electronic Health Record (EHR) interoperability and real-time data integration with hospital systems like EPIC. Proposed application extensions to support clinical decision-making and patient communication tools.

3D-Printed Receptor Model – Advanced Molecular Neuropharmacology. *Chapel Hill, NC | Aug - Dec 2025*

PI: Dr. Alexandra Nowlan.

- Designed and fabricated a functional, interactive physical model of the D3 dopamine receptor (GPCR) demonstrating conformational change triggered by a bitopic ligand (FOB02-04A), using cryo-EM structures.
- Processed receptor structures in **ChimeraX** and **Blender**; performed CAD modeling in **TinkerCAD** and **Onshape** to carve binding pockets; 3D printed in PLA/PETG on Makerspace FDM printers through multiple design iterations.
- Presented working model and research poster at UNC BeAM Makerfest as a communication tool for medicinal chemists and clinicians to visualize D3-selective bitopic agonist activity relevant to Parkinson's disease therapeutics.

Nanoparticle Anticancer Agent, Research & Innovation Program (SRIP) *Durham, NC | Aug 2021 - May 2022*

PI: Michael Bruno, Tim Anglin.

Investigated green synthesis of biogenic silver nanoparticles using agri-food byproducts as a reducing agent for anticancer.

- Employed computational chemistry molecular modeling techniques with **Schrödinger Maestro**, **Gaussian**, **MATLAB**, **Vortex**, and **WebMO**, alongside wet lab research for physicochemical property analyses and medical drug design. **3D-printed** ligands, modelled in **ChimeraX**, to illustrate orthostatic binding mechanisms.
- One of the Top 300 **Regeneron Science Talent Search (STS) Scholar** selected out of 2,162 international applicants.
- NC International Science Challenge winner issued by the NC SMT Center and the Morehead Planetarium Center.

Noninvasive Diabetes Treatment *Charlotte, NC | 2019 - 2022*

Multi-year independent project in biomedical nanotechnology on non-invasive diabetes treatment.

- Synthesized/self-assembled chitosan-insulin nanoparticles in laboratory for oral insulin delivery. Evaluated stability and release efficiency.
- Performed alpha-amylase inhibition assays on traditional medicinal herbs to assess hypoglycemic potential.
- Awarded **North Carolina BioGENEius Challenge Winner** and **International Finalist (2020)** for innovation in non-invasive therapeutics.

Wastewater Bioremediation *Charlotte, NC | Sept 2018 - July 2020*

Self-directed environmental research on the role of algae in remediating nitrate and phosphate contaminants from wastewater.

- Designed experimental apparatus and conducted serial assays to measure nutrient reduction efficiency.
- Published paper in the *International Journal of High School Research* (2020).
- Selected as a **Finalist at Intel ISEF - International Science and Engineering Fair (Phoenix, AZ; 2019)** and as a **Delegate to AJAS - American Junior Academy of Science (2020-2021)**.

WORK & VOLUNTEER EXPERIENCE

Ambassador – UNC School of Information and Library Science (SILS) *Chapel Hill, NC | Aug 2025 - Present*

Represent SILS to prospective students and families through campus tours, outreach events, and academic panels.

- Competitively selected to serve on the **SILS New School Student Advisory Board** during the SILS-SDSS merger forming the School of Data and Information Sciences (SDIS); provide input to school leadership on curriculum, student experience, resources, and institutional decision-making across graduate and undergraduate programs.
- Contributed to various Working Groups, listening to student concerns and aspirations about the new school; advocated for interdisciplinary connections bridging libraries, data science, AI, UX, and informatics.

Apprentice – Girls Who Code × Pluralsight Work Prep Apprenticeship *Remote | May - Jun 2023*

Selected for GWC's software development and career readiness program focused on both technical and professional development workshops with senior leaders and engineers at Pluralsight.

- Completed Pluralsight courses in full-stack web development, Python, Java, and cloud technologies. Gained experience with **SDLC**, **Agile & Waterfall** methodologies, **Git**, **DevOps**, and CI/CD pipelines.
- Served as a moderator of the official discord server used for student communication.

Handpicked as a Closing Ceremony speaker out of **over 100** participants, recognized for community leadership.

Co-Founder & Chief Operating Officer – SkyeLabs Innovation Inc. *Durham, NC | Sept 2020 - Aug 2024*

- Co-founded a sustainable materials startup developing EcoGel, a flexible carbon biopolymer aerogel with applications in high-performance apparel, aerospace, and space exploration; filed provisional patent for product.
- Directed all organizational operations: business plans, R&D strategy, product testing, prototyping phases, and funding; built product website employing **HTML/CSS** with **SEO optimization**, supporting outreach to investors and industry stakeholders; secured **\$2000** in research grant funding from the Bowman-Brockman Endowment for Entrepreneurship and Advanced Research.
- Won top honor of Pete Conrad Scholar in Aerospace & Aviation at the International Conrad Spirit of Innovation Challenge.
- Pitched to NASA engineers; recognized as Top 10 National Finalist and sole Honorable Mention in 2021 NASA iTech initiative, an industry-level entrepreneurial competition meant to identify technological advancements that solve problems on Earth with the potential to aid NASA missions.

Chemistry Tutor – SMath Tutors *Durham, NC | May 2021 - Jun 2022*

SMath Tutors is a student-led program providing affordable tutoring while raising funds for community causes.

- Tutored **16+** students in an Introduction to Chemistry course.
- Collectively contributed to **\$24,000** raised for the Food Bank of Central & Eastern NC.

Hematology/Oncology Volunteer – Novant Health Presbyterian Medical Center *Charlotte, NC | Jan - Mar 2020*

Novant Health is a nonprofit health system focused on patient-centered care.

- Assisted doctors, nurses, and medical staff in the hematology/oncology unit with patient log collection, assessments, visitor orientation, equipment preparation, health record maintenance, and daily non-clinical patient support.

Volunteer & Organizer – Loaves & Fishes Food Pantry *Charlotte, NC | Mar 2019 - Aug 2020*

Loaves & Fishes Food Pantry exists to provide free groceries and support to individuals and families facing food insecurity in Charlottesville and surrounding communities.

- Registered students and oversaw community service events. Organized fundraising drive and donation collection. Sorted, packaged, and distributed donations and groceries to families experiencing food insecurity during COVID-19.

LEADERSHIP & CAMPUS INVOLVEMENT

Co-President – UNC Zero Degrees *Chapel Hill, NC | Aug 2025 - Present*

- Scaled UNC's largest interdisciplinary social networking organization to **200+** active members on HeelLife and Discord; secured \$1800 in Undergraduate Senate Funding for programming and community events.
- Manage a platform for student communication and hosting weekly activities. Implemented automated moderation tools, interactive bots, and event analytics, expanding student engagement by **85%**.
- (Previously served as Technology Officer, 2023-2024) Managed server infrastructure, bot configuration, and digital communication systems for the chapter. Work with the board to foster a welcoming environment and community.

Facilitator & College Loop President – Girls Who Code, UNC Chapter *Chapel Hill, NC | Jan 2023 - Dec 2024*

- Developed structured lesson plans and taught Python programming to 50+ students weekly, beginning with Turtle for visual/interactive learning; lectured, held office hours, and mentored one-on-one project development through semester-long app design projects.
- Founded UNC's GWC College Loop (2026); guided coding projects and communicated with parents, alumni, and sponsors; partnered with local schools to expand CS access for underrepresented groups.

President – Technology Student Association (TSA), NCSSM Chapter *Durham, NC | Oct 2018 - Jun 2022*

- Directed **100+** students in state and national competitions and community service initiatives; fundraised **\$5,000+** through volunteering services. National Finalist in 3D Animation; Clark Technology Scholarship recipient (2022).

- Also served as Treasurer (Ardrey Kell chapter, 2018-2019) and Secretary (2019-2020), building foundational experience in organizational financial management and administrative coordination.

Co-Founder & President – Girls Who Code, NCSSM Chapter *Durham, NC | Oct 2020 - Jun 2022*

- Founded chapter providing coding education and mentorship to **80+** students.
- Organized hackathons and mentorship programs; coordinated projects and school events to build a supportive and low-barrier coding community.

Editor-in-Chief – Broad Street Scientific (BSS) *Durham, NC | Oct 2020 - Jun 2022*

- Led annual **100**-page STEM research publication; oversaw editorial staff of **20+** student editors and writers; critiqued and reviewed submissions, organized publishing workshops, decided annual journal theme (Chaos Theory).
- Designed submission management system and journal website with WordPress; interviewed Dr. Amay Bhandokar, Professor in Electrical and Computer Engineering at NC State University, for feature publication.

State President-Elect – North Carolina Student Academy of Science (NCSAS) *May 2021 - May 2022*

- Led the statewide student body, organized STEM competitions, and coordinated student research presentations at the state level. Connected high school researchers through mentorship and conferences.

Dorm Senator & Remote Representative – NCSSM Student Government *Durham, NC | Oct 2020 - Jun 2022*

- Created and managed a 90+ member online community and support network during COVID-19 remote learning.
- Organized volunteer opportunities, handled student grievances, and hosted mental health awareness activities; represented fully-remote learners in Student Government meetings.

Mentor & Teaching Assistant (TA) – Young Professors Program *Charlotte, NC | Aug 2019 - Aug 2021*

- Mentored students at Community House Middle School in math, science, English, and social studies.
- Graded papers and assessments. Guided science fair projects and classroom instruction.

ESL Ambassador – Ardrey Kell High School (AKHS) *Charlotte, NC | Aug 2018 - Dec 2022*

- Assisted international students with class integration; translated official documents into Bengali and tutored English one-on-one.

ADDITIONAL PROJECTS

Web Archive Forensics Service Proposal – Human Information Interactions

- Designed a three-tier reference and capture service (capture-on-demand, verification workshop series, and a curated NC accountability web collection) for the State Library of NC, grounded in an information-needs analysis of independent accountability journalists statewide.
- Assessed institutional capacity against **Archive-It** infrastructure and **WARC/ISO 28500** standards; scoped feasibility, limitations, and service precedents from library-newsroom partnerships.

Internet Archive Access-Policy Framework – AI Law & the Struggle for Knowledge

- Authored a board-ready annotated policy memo governing bulk automated access to digital collections; analyzed legal uncertainty, technical limitations, and institutional capacity across five stakeholder groups to justify each provision.
- Drafted proposed Terms of Service text, a tiered access framework, a model Data Trust Agreement, and staff implementation guidance.

Temperament Test Website – Pearl Hacks Hackathon

- Developed full-stack web app using HTML, CSS, and JavaScript that generated temperament profiles through user-interactive forms.
- Implemented local storage, custom animations, and responsive interface design for accessibility across devices.
- Awarded **Highest STEM-Interest Inclusivity Runner-Up** by Qorvo Inc. out of all hackathon submissions, recognized for inclusive design and effective STEM communication.

Digital Art Exhibition Catalog – Intro to New Media Course

- Created an immersive virtual gallery using JavaScript Three.js 3D library and Blender, implementing an explorable 3D environment with dynamic lighting and spatial navigation.
- Integrated Twine narrative scripting and layered media transitions with Photoshop for an interactive, choice-based visual storytelling experience.

HONORS & AWARDS

Pearl Hacks Hackathon Award – Highest STEM-Interest Inclusivity Runner-Up, Qorvo Inc. (2023); Regeneron Science Talent Search (STS) Scholar – Top 300 of 2,162 applicants (2022); National JSHS Momentum Grant (2022); North Carolina International Science Challenge Winner (2022); Bowman-Brockman Endowment Recipient – \$2,000 R&D funding (2022); NASA iTech Honorable Mention & Top 10 Finalist (2021); Pete Conrad Scholar – Conrad Spirit of Innovation Challenge,

Aerospace & Aviation (2021); Coca-Cola Scholar Semifinalist – Top 2% of 68,000+ applicants (2021); Carson Scholar (2021); AJAS Fellow & Lifetime Honors (2020-2021); International BioGENEius Challenge Finalist & NC Winner (2020); National TSA Finalist & Award Winner (2019, 2021); Intel ISEF Finalist (2019); World Science Scholar – 1 of 30 selected globally (2019); National Speech & Debate Academic All-American; USCF Top-34 Female Player in Age Group (2019).

PUBLICATION

Roychoudhury, H. (2020). *Bioremediation of Wastewater Using Algae to Reduce Nitrate and Phosphate Content*. *International Journal of High School Research*.

TECHNICAL SKILLS

Programming: Python, SQL, Java, JavaScript, Assembly, HTML/CSS, Dart.

Frameworks & Libraries: TensorFlow, Keras, MNE (EEG), Flutter, Git, Node.js, PyTorch, Three.js, FHIR API, Leaflet, AJAX, React, scikit-learn.

Software: GitHub, MATLAB, Wix, WordPress, Schrödinger Maestro, Gaussian, ChimeraX, Vortex, WebMO, Zotero.

Tools: Blender, Twine, Figma, Microsoft 365 (Excel, Word, PowerPoint), Google Workspace (Docs, Forms, Slides, Sheets, Calendar), Adobe (Photoshop, Acrobat DC), Tinker CAD, Auto CAD, OnShape, Notion, Discord, Obsidian.

Methodologies: Agile, Waterfall, Scrum, SDLC, DevOps, CI/CD, Critical Path Method (CPM), PRISMA Systematic Review, User-Centered Design.

Languages: English (Fluent), Bengali (Fluent), Spanish (Proficient), Hindi (Novice).