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🐙 Github

Tongyu Zhou

Education

- 2020– **Brown University, Providence, RI.**
Ph.D in Computer Science
- 2016– **Williams College, Williamstown, MA.**
2020 Bachelor of Arts in Computer Science (honors) and Statistics, Sigma Xi, Mu Sigma Rho
2019 **Aquincum Institute of Technology, Budapest, Hungary.**
CS Study Abroad Program
- 2009– **Hunter College High School, New York, NY.**
2016 Scholar of Distinction, Art Scholarship, Creative Writing Honors

Publications

- 2020 **Zhou, T.**, Sheng, H., & Howley, I. (2020). Assessing Post-hoc Explainability of the BKT Algorithm. In AAAI conference on Artificial Intelligence, Ethics, and Society, full paper.
- 2018 Cho, Y., Mazzarella, G., Tejada, K., **Zhou, T.**, & Howley, I. (2018). "What is Bayesian Knowledge Tracing?" In IEEE VIS Workshop on Visualization for AI Explainability, workshop paper & poster.

Experience

- 2019 **Research in Industrial Projects for Students, Los Angeles, CA.**
REU at the Institute for Pure & Applied Mathematics, UCLA
Sponsor: The Aerospace Corporation, Technical Report: Link
Mentors: Victor Lin, Leah Ruckle, Karen Wood, Minh Pham
 - Designed and implemented a genetic algorithm incorporating an ensemble of MLP and RBF neural networks to approximate expensive surrogate functions for canonical test problems
 - Used the ML model to reduce runtime by fivefold in computing the Walker satellite constellation parameters that minimized 98% global dilution of precision
- 2018 **Human-Computer Interaction Research Assistant, Williamstown, MA.**
Williams College Department of Computer Science
Mentor: Iris Howley
 - Created interactive explainables to teach Bayesian Knowledge Tracing to various levels of understanding to spread algorithmic transparency and interpretability, work was instrumental in NSF Grant #1849984
 - Mapped gender representation of question askers at the 2018 SIGCHI conference by analyzing audio using speech diarization, performed categorization with Gaussian mixture models using MFCCs

2017 **Bioinformatics Intern at the Gavril Pasternak Lab, New York, NY.**

Memorial Sloan Kettering Cancer Center

Mentor: Takeshi Irie

- o Constructed data models and interactive cladograms to visualize relationships between G-protein coupled receptors splice variants and alternative promoters, signal peptides, and exon abundance
- o Assisted in the construction of an Arduino prototype of a self-administration system for mice

2017– **Computer Science Teaching Assistant, Williamstown, MA.**

Present Williams College Department of Computer Science

- o Algorithm Design and Analysis (2018–Present): Hosted sessions and graded assignments on efficient, provably correct algorithms dealing with divide-and-conquer, dynamic programming, and NP-hardness
- o Data Structures and Advanced Programming (2017): Assisted professors during lab sessions pertaining to object-oriented programming with an emphasis on networks, graphics, and UI

Presentations

2020 "Confusion Detection on Annotator Affect," undergraduate thesis

2019 "Combining Genetic Algorithms and Machine Learning for Modeling Complex Systems," joint presentations at RIPS REU Projects Day and at the Aerospace Corporation

2018 "Manual and Automated Voice Gender Detection," Williams Summer Science Program

2017 "Exon, Signal Peptide, and TM Splice Variant Analysis of GPCRs," Pasternak Lab Conference

Awards

2020 CRA Outstanding Undergraduate Researcher Awards Honorable Mention

2019 Research in Industrial Projects for Students Stipend and Travel Award

2019 Williams College Computer Science Class of 1960's Scholars (nominated)

2018 Williams College Summer Science Research Fellowship

2017 Murphy Family Scholarship

2009– National Merit Commended Scholar (2015), Scholastic Art and Writing Gold Key Awards

2016 (2015–2016), First Place in Soph-Frosh NYCIML (2014), Summa Cum Laude on National Latin Examination (2013–2014)

Projects

2019 **Secure Multiparty Chat:** uses end-to-end encryption in CTR mode to support the construction of a group chat over a proxy network, where the group key is generated by the chat inviter and transported securely using the ISO-11770-3/2 protocol

2019 **Raytraced Beach:** ray tracer program that renders a 3D beach scene using OpenGL, specular highlights followed the Phong-Blinn BRDF model, reflective and refractive surfaces were approximated with the Fresnel formula

- 2018 **waitER**: [*devpost*] web application that aims to bring transparency to patient wait times in the emergency room by maintaining live updates to queues, a homepage accessible through uniquely generated IDs, a triage page to determine patient ESI, and an admin dashboard, awarded top 30 hacks at PennApps XVIII
- 2018 **Mobile Apps Analysis**: uses Bayesian logistic regression and diagnostics such as WAIC, posterior check, ESS, and Gelman-Rubin to evaluate factors that contribute to app ratings across the AppStore and the PlayStore

Relevant Courses

- Computer Science Computer Graphics, Applied Cryptography, Artificial Intelligence, Natural Language Processing, Algorithm Design and Analysis, Theory of Computing, Mobile Software Development, User-centered Design of AI Explainables, User Interface Design, Computer Organization, Principles of Programming Languages, Data Structures and Advanced Programming
- Math Operations Research, Probability, Linear Algebra, Discrete Mathematics, Multivariable Calculus
- Statistics Bayesian Statistics, Regression and Forecasting, Statistics and Data Analysis

Other Extracurricular & Work Activities

- 2017– **Applications Consultant**, *Cambridge, MA*.
 2019 CollegeVine
 - Helped clients navigate the college application process through one-on-one advising to formulate future plans that align with their current goals
 - Edited applications for coding camps and worked with clients through online CS courses
- 2017– **Social Chair**, *Williamstown, MA*.
 2018 Williams College Chinese-American Student Organization
 - Responsible for intra-organization relations through instating programs and planning events that encourage building friendships and community among current members
- 2013– **Language Partner**, *New York, NY*.
 2016 Chinatown Youth Initiatives: Chinatown Literacy Project
 - Taught non-native speakers the English language at a program aimed to spread literacy through personalized instruction and held workshops on prevalent community and civic issues

Skills

- Languages Python, Java, R, C/C++, Javascript, CSS/HTML, \LaTeX
- Tech Photoshop, Illustrator, Excel
- Art & Design [*portfolio*]: Took commissions in digital character designs and watercolor landscapes and contributed to charity art book projects with 37 participants across the globe