

Ji Won Chung

RESEARCHER · VISUAL COMPUTING · AUGMENTED REALITY

Providence, RI 02912

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My research focuses on creating human-centric visual computing systems that advance people's interactions with visual data. I am interested in how interactive systems can enhance or change an individual's understanding of the visual world, particularly in the realms of Augmented & Mixed Reality.

Education

Brown University - Ph.D. Student in Computer Science

CUMULATIVE GPA: 4.00/4.00

- Advisors Jeff Huang & James Tompkin Human Computer Interaction Lab
- Related Coursework: Advanced Graphics, Computer Vision for Graphics and Interaction, Deep Learning, Computer Vision, UI/UX

Providence, RI

Sep 2021 - May 2027

Smith College - B.A. Computer Science, Mathematics Minor

CUMULATIVE GPA: 3.99/4.00

- Highest Honors in Computer Science | Magna Cum Laude | Phi Beta Kappa | Sigma Xi | Dean's List 2015-18

Northampton, MA

Sep 2015 - May 2018

Research Experience

Brown HCI Lab & Visual Computing Group

PHD STUDENT

- **Privacy-Conscious Passthrough for Mixed Reality** Natural user interactions conscious of user privacy and mixed spaces via Unity on Quest Pro
- **HoloScreen: 2.5D Effect on Phones** Create 2.5D anamorphic illusions on screens via JavaScript for people with monoscopic vision
- **AR Glasses for Non-Users** Conducted a participatory design study with 10 people to investigate interactions between users and non-users of AR Glasses and create design considerations for no-users as the primary stakeholders using Spectacles and Lens Studio
- **Detecting Longterm Sleep Irregularity** Created a model that detects irregularity in sleep from Sleep as Android dataset, using mean of successive squared differences, and conducted a visual evaluation with domain experts at the Brigham Women's Hospital, Division of Sleep Medicine

Providence, RI

May 2022 - Present

Graph-based Matching for Word Spotting in Handwritten Documents

SENIOR THESIS | AWARDED HIGHEST HONORS 🏆

- Proposed a new method to measure similarity of two part-structured Inkball models and increased accuracy in query retrieval of handwritten words on the standard George Washington 20 dataset using MATLAB
- Formalized similarity of two models via a bidirectional match between two graphs and an introduction of two new measures to capture many-to-one matches of nodes and the structural differences between graphs

Northampton, MA

Sep 2017 - May 2018

Human Computation & Visualization Laboratory

RESEARCH ASSISTANT

- Designed and developed *DSMVis: Interactive Visual Exploration of the DSM-5 for Mental Health Providers*, an interactive diagnoses filtering system via bubble charts to reduce diagnostic bias of mental health clinicians and organizational bias of the DSM-5 using D3.js, HTML, and CSS
- Conducted machine learning analysis and web-scraped, curated, and cleansed data through use of Python packages Grahpviz, scikit-learn, matplotlib, Seaborn, NumPy, SciPy, pandas, and plotly and R
- Created interactive network graph and corresponding adjacency matrix using D3.js, HTML, and CSS to investigate new data visualization techniques in networks for cyber security analysts

Northampton, MA

May 2016 - May 2017

Work Experience

Morgan Stanley

TECHNOLOGY ASSOCIATE & TECHNOLOGY ANALYST PROGRAM - LISTED SALES & TRADING

- Developing new routing framework capabilities for real-time electronic sales and trading systems for high-profile, critical sales and trading platforms used by traders, account managers, quants and compliance and risk officers in C++, Python, and XML
- Comparative performance and stress testing to identify bottlenecks and load capacity to account for high-volume trading
- Created a GUI for regression testing to facilitate client migration and binary upgrades using Jasmine testing framework, Flask, Mongo DB, and Angular
- Built a release manager UI to automate software deployment workflow using Scala, Java, and Splunk

New York, NY

Aug 2018 - May 2021

Pacific Northwest National Laboratory

NATIONAL SECURITY INTERNSHIP PROGRAM

- Developed an interactive, web-based visualization tool to discover and detect anomalies and patterns in graphs containing info on interactions and behaviors of actors, entities, and/or features in React and D3.js
- Linked analytical tooltips and histogram visualizations with D3 graph models and enabled editing functionality to interact with graphs

Seattle, WA

Jun 2017 - Aug 2017

Papers & Conferences

- N. Howe and J. W. Chung, "Symmetric Inkball Alignment with Loopy Models," *2019 International Conference on Document Analysis and Recognition (ICDAR)*, Sydney, Australia, 2019, pp. 349-354, doi: 10.1109/ICDAR.2019.00063. Available Preprint 📄.

- J. W. Chung, I. Raut, J. Y. Yun, K. Pien, S. Sridhar, M. R. Crouser, and R. J. Crouser, "DSMVis: Interactive visual exploration of the DSM5 for mental health providers," *2017 IEEE Conference on Visual Analytics Science and Technology (VAST)*, Phoenix, AZ, USA, 2017. **Honorable Mention Best Poster** 🏆.
- J. W. Chung, "Dynamic Network Analysis via Motifs (DYNAMO) Software Development," *2017 Pacific Northwest National Laboratory National Security Internship Program Research Symposium*, Richland, WA, USA, 2017. Presentation 🎤.
- J. W. Chung, Z. Rizvi, S. Sridhar, and J. Y. Yun, "A Business Opportunity: Targeting Expedia's Niche Market in Travel Packages Via Analytical and Predictive Modeling," *2017 Electronic Undergraduate Statistics Research Conference (eUSR)*, 2017. **Third Placed Paper in USCLAP Competition in Intermediate Statistics** 🏆 and Presentation 🎤.

Projects

Semantic Room Reconstruction with CLIP and NeRF

Providence, RI

FINAL PROJECT - COMPUTER VISION FOR GRAPHICS AND INTERACTION

Nov 2022

- 3D Room reconstruction with NeRF using CLIP on Meta's Replica dataset to enhance text-based 3D room editing

Predicting Eye Gaze for Natural Gaze Generation

Providence, RI

FINAL PROJECT - DEEP LEARNING

Nov 2022

- Extract eye features from WebGazer dataset using MediaPipe and created a CNN-LSTM architecture to predict eye gaze for natural gaze interactions

Mentoring

2021-2022 **Brown HCI Lab Research Mentor**, Jiahua Chen'24, Neil Xu'24, Kevin Hsu'24

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2021 **Brown ExploreCSR Mentor**, Lucas Weissman, Williams College

Providence, RI

2020 **Rewriting the Code**, Mentor

New York, NY

2020 **Break Through Tech's Summer Guild for CUNY**, Mentor

New York, NY

2019-2020 **Morgan Stanley Technology Analyst Program**, Mentor & Peer Advisor

New York, NY

2019 **Girls Who Code**, Summer Program Mentor

New York, NY

2017 **Girls Who Code**, Teaching Assistant

Northampton, MA

2017 **AEMES Program**, Peer Mentor

Northampton, MA

Volunteer Work

2022 **Graduate WiCS Brown**, Reignited Meetups

Providence, RI

2022 **Diversity and Inclusion Initiative**, PhD Student Representative

Providence, RI

2020 **Billion Oyster Project (BOP)**, UI Development, Global Excellence Award - Giving Back

New York, NY

Honors & Awards

2022 **Finalist, Digital Health Pitch Competition**, SRIW - Sleep Regularity in the Wild

Providence, RI

2020 **Global Excellence Award - Giving Back**, Awarded by Morgan Stanley for Volunteering on Billion Oyster Project

New York, NY

2017 **IEEE Visual Analytics Science and Technology Conference**, Honorable Mention for Best Poster

Phoenix, AZ

2017 **Grace Hopper Conference**, Student Scholar

Orlando, FL

2017 **Five College DataFest**, First Place - Best in Show and Best in Group

Amherst, MA

2017 **International Interdisciplinary Contest in Modeling (ICM)**, Meritorious Winner (Top 10%)

Bedford, MA

2017 **National Draper Competition for Collegiate Women Entrepreneurs**, Semi-Finalist

Northampton, MA

2017 **HackSmith III Hackathon**, Second Place

Northampton, MA

2017 **Intermediate Level Undergraduate Class Project Competition (USCLAP)**, Third Place

Northampton, MA

2017 **Grinspoon Entrepreneurship Initiative**, Concept Award

Holyoke, MA

2016-17 **OTEF Foundation Scholarship**, Academic Scholarship for students of Korean Descent

Northampton, MA

2016 **Arthur Ellis Hamm Prize**, 1st Year with Highest GPA at Smith College

Northampton, MA

2016 **Summer Undergraduate Research Fellowship**, Computing for Mental Health Project

Northampton, MA

Technical Skills

- Python, Java, Angular, Flask, JavaScript, C++, Unity, MATLAB, Scala, C#, D3.js, React.js, XML, HTML, CSS, x86 Assembly, Git, Linux, Bash, C, Data Wrangling, Web-Scraping, WebGL, Blender, SQL, Sybase