Ji Won **Chung**

Researcher · Long-term Computing · Visual Systems

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My research focuses on creating long-term, human-centric systems that adapt to changing human behaviors. I do high-impact work on real, deployed sleep-tracking systems and create new, interactive visual systems that fundamentally transform people's behaviors and relationships with visual data.

Education

Brown University - Ph.D. Candidate, Computer Science — *Providence, RI*

Cumulative GPA: 4.00/4.00 - Advisors Jeff Huang & James Tompkin — *Sep 2021 - May 2027*

Smith College - B.A. Computer Science, Mathematics Minor — *Northampton, MA*

Cumulative GPA: 3.99/4.00 - Highest Honors in Computer Science, Magna Cum Laude, Phi Beta Kappa, Sigma Xi — *Sep 2015 - May 2018*

Current Research

Brown Human Computer Interaction Lab — *Providence, RI*

PhD Candidate - Advisors Jeff Huang & James Tompkin — *May 2022 - Present*

Long-term Behavioral Computing

- Implementing the Sleep Regularity Index, a model demonstrating day-to-day behavioral sleep changes to enhance long-term consistency in sleep behavior for 1 Million active users of Sleep as Android, Currently in Beta Testing
- Developing long-term systems that reflect changing, human sleep behaviors to counter current sleep-tracking systems, biased towards short-term data and normative users, via a data-driven investigation of sleep data with 150k+ users and 6.5 years of data and an interdisciplinary collaboration with domain experts at the Brigham Women's Hospital's Division of Sleep and Circadian Disorders
- Extracting data from sleep wearables to investigate practical limitations of real-world tracking devices to help measure sleep and heart rate in persons living with Alzheimer's Disease and Related Dementias

Enabling Visual Systems

- Developing drawing-directed authoring systems that generate 2.5D and 3D objects to enable new creative storytelling methods and facilitate authoring experiences for designers and artists on the web
- Creating a system enabling multi-view points and transitions on VR headsets for cinematic, film edits and set design in mixed reality
- Implementing custom raster plot visualizations in Python to help sleep clinicians detect irregular sleep behaviors

Work Experience

Adobe Research — *San Jose, CA*

Research Scientist Intern - Mentor Ryan Rossi | Core Technologies, Data Science Lab — *May 2023 - Aug 2023*

- Developed a performative visualization system using Swift and ARKit and a formative study with 5 visualization experts - *Paper In Submission*

Morgan Stanley — *New York, NY*

Technology Associate & Technology Analyst Program - Listed Sales & Trading — *Aug 2018 - May 2021*

- Developed 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

Pacific Northwest National Laboratory — *Seattle, WA*

National Security Internship Program — *Jun 2017 - Aug 2017*

- 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, by linking graphs, tooltips, and histograms in React and D3.js

Publications

J. Chung, J. Fu, Z. Deocadiz-Smith, M. F Jung, and J. Huang. 2023. "Negotiating Dyadic Interactions through the Lens of Augmented Reality Glasses". In Proceedings of the 2023 ACM Designing Interactive Systems Conference (DIS '23). Association for Computing Machinery, New York, NY, USA, 493–508, doi: 10.1145/3563657.3595967

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

Select Press

Sleep as Android Sleep Regularity Index, Oct 2023

IEEE Spectrum AR Glasses Spawn a Whole New Social Dynamic, Sep 2023

Posters

J. 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. 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. 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.** Presentation.

Past Research Experience

Graph-based Matching for Word Spotting in Handwritten Documents

Northampton, MA

Senior Thesis - Nick Howe | Awarded Highest Honors *Sep 2017 - May 2018*

- 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

Human Computation & Visualization Laboratory

Northampton, MA

Research Assistant - R. Jordan Crouser *May 2016 – May 2017*

- 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

Mentoring

Ivery Chen	Undergraduate, Brown University & RISD	*Feb 2023 - Present*
Kevin Hsu	Undergraduate, Brown University	*May 2022 - Aug 2022*
Neil Xu	Undergraduate, Brown University	*Feb 2022 - May 2022*
Lucas Weissman	Undergraduate, Williams College, exploreCSR Program	*Feb 2022 - May 2022*
Jiahua Chen	Undergraduate, Brown University	*Sep 2021 - Dec 2022*

Service

Reviewing

CHI 2024	Paper Reviewer (x3)	*Oct 2023*
UIST 2022	Paper Reviewer (x1)	*May 2022*
CHI 2022	Helped Paper Review (x1)	*Oct 2022*
SIGGRAPH 2022	Poster Reviewer (x2)	*May 2022*
CHI 2023	Helped Paper Review (x1)	*Oct 2021*

Brown University

GWICS+	Lead Organizer of Graduate Women in CS+	*Feb 2022 - Present*
D&I Committee	PhD Student Representative of the Diversity and Inclusion Committee	*Sep 2021 - Present*
exploreCSR	PhD Mentor for undergraduates pursuing Socially-Responsible Artificial Intelligence	*Feb 2022 - May 2022*

Awards & Honors

Finalist	Digital Health Pitch Competition, Sleep Regularity in the Wild	*Jun 2022*
Global Excellence Award - Giving Back	Awarded by Morgan Stanley for Volunteering on Billion Oyster Project, Deployed UI App for Oyster Data Collection	*Oct 2022*
Honorable Mention Best Poster	IEEE Visual Analytics Science and Technology Conference, DSMVis: Interactive Visual Exploration of the DSM-5 for Mental Health Providers	*Aug 2017*

Related Coursework

Advanced Graphics, Computer Vision for Graphics and Interaction, Deep Learning, UI/UX, HCI Seminar, Designing Human-Centered Technologies

Technical Skills

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