

Marx Wang

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Research Interests

Human-Computer Interaction, Human-AI Collaboration, Well-Being, Positive Computing
Social Computing, Ubiquitous Computing, Personal Informatics

Computational Modeling, Psychological Well-being, Positive Psychology, Computational
Neuroscience, Social Cognition, Child and Adolescent Development, Emotional Regulation,
Adversity and Resilience, Interpersonal Relationships in Peers and Family Contexts, Attachment
Theory, Psychopathology

Education

August 2021 - Present

Virginia Tech, Blacksburg, VA

Master of Science (MS), Computer Science and Application, GPA 4/4

Expected Graduation Date: Fall 2023

Thesis: Understanding How Users Express Their Social Identities through Animated Gif for Public Discourse

Advisors: Dr. Sang Won Lee (Chair), Dr. Kurt Luther, Dr. Eugenia Rho

August 2018 - May 2021

Virginia Tech, Blacksburg, VA

B.S. in Computer Science, Data Centric Computing, GPA 3.98/4

Graduated Summa Cum Laude in three years with Dean's list 6/6 semester and Honor College

Publications

Peer-reviewed Articles ([J]ournal and [C]onference proceedings)

[J.1] Yuan Li, Donghan Hu, **Marx Wang**, Doug A Bowman, and Sang Won Lee. 2021. The Effects of Incorrect Occlusion Cues on the Understanding of Bare-handed Referencing in Collaborative Augmented Reality. *Frontiers in Virtual Reality*. <https://doi.org/10.3389/frvir.2021.681585>

[C.1] Manisha Kusuma, Vikram Mohanty, **Marx Wang**, and Kurt Luther. 2022. Civil War Twin: Exploring Ethical Challenges in Designing an Educational Face Recognition Application. In *Proceedings of the 2022 AAAI/ACM Conference on AI, Ethics, and Society (AIES '22)*. Association for Computing Machinery, New York, NY, USA, 369–384. <https://doi.org/10.1145/3514094.3534141>

Full Papers Currently In Review

[C.2] **Marx Wang***, Daniel Manesh*, Ruipu Hu, and Sang Won Lee. 2022. iThem: Programmable Connections Between IFTTT Services. (* Equal contribution)

Peer-reviewed [P]osters and [W]orkshop Papers

[P.1] **Marx Wang** and Sang Won Lee. 2022. TaskScape: Fostering Holistic View on To-do List With Tracking Plan and Emotion. In The Adjunct Publication of the 35th Annual ACM Symposium on User Interface Software and Technology (UIST '22 Adjunct). Association for Computing Machinery, New York, NY, USA, Article 31, 1–4. <https://doi.org/10.1145/3526114.3558720>

[P.2] **Marx Wang**, Zachary Duer, Scotty Hardwig, Sam Lally, Alayna Ricard, and Myounghoon Jeon. 2022. Echofluid: An Interface for Remote Choreography Learning and Co-creation Using Machine Learning Techniques. In The Adjunct Publication of the 35th Annual ACM Symposium on User Interface Software and Technology (UIST '22 Adjunct). Association for Computing Machinery, New York, NY, USA, Article 22, 1–4. <https://doi.org/10.1145/3526114.3558708>

[P.3] **Marx Wang**, Daniel Manesh, Ruipu Hu, and Sang Won Lee. 2022. iThem: Programming Internet of Things Beyond Trigger-Action Pattern. In The Adjunct Publication of the 35th Annual ACM Symposium on User Interface Software and Technology (UIST '22 Adjunct). Association for Computing Machinery, New York, NY, USA, Article 53, 1–5. <https://doi.org/10.1145/3526114.3558776>

[P.4] **Marx Wang**, Ya-Yun Chen, Tae-Ho Lee. 2022. Predicting Prosocial Behavior in Childhood and Early Adolescence by Integrating Parental Factors, Neighborhoods and The Brain. Biennial Meeting of the Society for Research on Adolescence.

[P.5] Ya-Yun Chen, **Marx Wang**, Tae-Ho Lee. 2022. Predicting Aggressive Behavior in Childhood and Early Adolescence with the Socioecological Approach: From Neighborhoods, and The Brain. The 14th Annual Meeting of the Social & Affective Neuroscience Society.

[P.6] Viral Pasad, **Marx Wang**, and Sang Won Lee. 2020. Understanding the Challenges of Online Group Chat for Productive Discourse at Scale. In Conference Companion Publication of the 2020 on Computer Supported Cooperative Work and Social Computing (CSCW '20 Companion). Association for Computing Machinery, New York, NY, USA, 365–369. <https://doi.org/10.1145/3406865.3418335>

[W.1] Vikram Mohanty, **Marx Wang**, David Thames, Manisha Kusuma, and Kurt Luther. 2020. Find Your Twin in History: Exploring Ethical Design Challenges in Facial Recognition. In Conference Companion Publication of the 2020 on Computer Supported Cooperative Work and Social Computing (CSCW '20 Companion). Association for Computing Machinery, New York, NY, USA, 365–369. (Ethics in Design Workshop.)

Currently Under Preparation

[C.3] **Marx Wang**, Momen Bhuiyan, Eugenia Rho, Kurt Luther, and Sang Won Lee. 2022. Understanding How Users Express Their Social Identities through Animated Gif for Public Discourse.

[C.4] **Marx Wang**, Sang Won Lee. 2022. TaskScape: Applying Well-Being Oriented System Design in To-do List For Fostering Holistic Awareness.

[C.5] **Marx Wang**, Ya-Yun Chen, and Tae-Ho Lee. 2022. Prosociality in Children and Adolescents: Accessing Effects of Neighborhoods, Family, Environment and Neurological Factors With Machine Learning Techniques.

[C.6] Ya-Yun Chen, **Marx Wang**, Tae Ho Lee. 2022. Exploring the Effect of Socioecological and Neural Approach in Predicting Child Aggression.

Research Experience

Fall 2019 - PRESENT

Research Assistant, EchoLab, Virginia Tech

- Led a team of 3, designed and implemented a machine learning pipeline that visualizes user emotions through auto-suggesting gifs in real time based on messages in ongoing conversation with NLP and CNN. Achieved 95.6% accuracy rate in composite models of multiple high-level linguistic features such as empathy, sarcasm [C.3].
- Organized user studies and implemented high fidelity twitter like study programs for ecological validity. Applied sociolinguistic techniques such as matched disguised tests. Built web scraping scripts and collected a dataset with approximately 1000000 gifs. Extended studies to multiple computational sociolinguistic studies in multimodal natural language processing and search engine bias [C.3].
- Designed user studies with real time collaborative tasks to analyze users' behavior patterns and coping strategy in disorganized group chat. Conducted thematic analysis, moderated user studies, analyzed large scale data. Engineered 6 novel chat systems in MeteorJS with psychology-backed features such as live keystrokes to realize co-temporality [P.6].
- Heuristically evaluated the UX of Microsoft HoloLens. Developed synchronous web applications for VR studies without any framework (with JavaScript, PHP, MySQL, Apache) Thematically analyzed users' compensatory spatial referencing strategies in AR conditions [J.1].

Jan 2020 - Present

Research Assistant/UX Designer, Mind Music Machine Lab, Virginia Tech

- Designed mapping systems to computationally capture emotional experiences and cognitive messages of art and translating visual features (e.g. painting structure) to auditory parameters (e.g. tempo).
- Designed and implemented EchoFluid, an AI-powered choreography tool that allows dance learners to easily build their AI models for practices and co-creation. Implemented the algorithm with reinforcement learning for real time dance movement analysis and developed the interface with Unity. Presented the work at UIST2022 [P.2].

June 2021 - Present

Research Assistant, Affective Neurodynamics and Development Lab, Virginia Tech

- Used machine learning techniques to forecast children's prosocial behaviors, improved model accuracy from 55% to 85%, created data visualization to effectively communicate findings to various stakeholders. Presented work at SANS 2021 [P.4, P.5].
- Conducted comprehensive data analyses and regression analyses, applied advanced statistics, and modeled the complex relationship between family, neighbors, and environmental factors and children's prosocial and aggressive behaviors. Conducted fMRI Scan and analyzed neurobiological data [C.5, C.6].

June 2021 - Present

Research Assistant, Crowd Intelligence Lab, Virginia Tech

- Conducted user research to understand elderly users' privacy concerns, designed effective visualizations and detailed gradual steps to clearly communicate underlying ethical challenges in data privacy, transparency, security, gender and racial bias, while effectively educating AI concepts to an older audience, designed selected to CSCW 2021 workshop and published in AIES 2022 Conference [C.1].
- Designed UI/UX of [Civil War Twin website](#), a historical educational website that allows people to use AI to find their look-alike in the Civil War era. Implemented high fidelity frontend with animation in JavaScript to fulfill innovative frontend implementation requirements, coordinated with the lead developer and integrated the frontend with Django based backend [P.7].

Teaching

Fall 2021

Graduate Teaching Assistant

User Interface Software, with Dr. Kurt Luther, 78 students

Spring 2022

Graduate Teaching Assistant

Professionalism in Computing, with Dr. Daniel Dunlap, 200 students

Technical Skills

Machine Learning & Data Analytics & Mathematical Modeling

Data Analytics, Regression Analysis with R, Python;
 Relational Database Management Systems: SQL, MySQL, PostgreSQL, MongoDB;
 Natural Language Processing, Computer Vision, Applications of Machine Learning with TensorFlow;

UI/UX Design Research & Usability Engineering & Graphic Design

Interface Design, User Study, Interview, and Evaluation;
 Interaction Design, Wireframe & Prototype Design, Conceptual Model Design, Contextual Analysis, Storyboarding, Heuristic Evaluation;
 Figma, Sketch, Framer X, Cinema 4D, Photoshop, InDesign, Premiere Pro, After Effect, Illustrator;

Software Development

Proficient in rapidly developing and deploying full stack web apps, blockchain apps, and other popular software languages:

JavaScript with NodeJs, NextJs, React, Redux;

Django, Java, PHP; Unity, HTML5, CSS, Bootstrap;

Blockchain Dapps with Solidity, Smart Contracts;

Worked with Cloud Providers (AWS, Heroku, Azure) and Third-Party APIs (Twitter APIs, Auth0 APIs, Google APIs, Giphy APIs)

Extracurricular Activities

Jan 2021 - July 2021

Founder & CEO, [PikaCourse.Com](https://pikacourse.com)

- Founded PikaCourse.com, a social networking course scheduler designed for students to easily meet people, passively make friends, and effectively preserve peer connections
- Managed a team of 6 members remotely across 4 different colleges, recruited 97 beta users, received Apex Center KickStart Award
- Led business strategy and product design, conducted need analysis of student's social needs during lockdown
- Formulated business problems, surveyed customer need and market, navigated rapid decision making through competing priorities and risks, defined detailed product requirements, produced high fidelity product design with 93.2% users' approval in two weeks
- Led cross-functional team, proactively identified risks, communicated technical needs precisely, resolved conflicts effectively, built a positive, supportive, and vibrant work environment with 100% of the members return
- Branded, designed, and developed the frontend and backend of the web applications with React, Ant Design and Django, produced a fully functional product from scratch in less than three weeks

Fall 2022 - Present

Graduate Assistant, Graduate Student and Professional Senate

- Organized all of the organization's large annual events such as Research Symposium and Graduate School Career Fair with 63 schools and more than 900 people attending in total
- Worked with director of finance and graduate student budget board to managed Virginia Tech graduate school's student organization activity budget of \$250,000
- Assisted in successfully execution of a variety of student advocacy activities such as Graduate Student Living Wage TaskForce, Day of Action Women's Right march

- Worked closely with 7 exec board members and more than 100 senators and student representatives to elevate day to day operations of Virginia Tech Graduate Student Senate, facilitate impeccable office organization and positive communication and support efficiency, professionalism and performance objectives

Jan 2015 - Present

Graphic Designer, Freelance

- Led and managed a cross-functional team of 32, worked through ambiguous, open-ended business requirements, communicated with multiple stakeholders to understand needs and goals, crafted visual system, drafted design guidelines, and produced a 496-pages printed book in 15 days
- Engaged and helped clients to discover and define their needs with effective communication and storytelling, utilized customer-centric mentality to listen to clients' feedback and revise designs.
- Formulated ideas based on client's need, illustrated abstract aesthetic concepts, designed various posters, flyers, logos, videos, and visual identities, rapidly created and iterated on designs within 6h

Raft Crisis Hotline, Jan 2022 -Present

Mock Trial, Regional Best Attorney, Sept 2021 – Present

Phi Alpha Delta, International Pre-law Fraternity, Sept 2021 – Present

Phi Beta Kappa, May 2021

Lambda Iota Mu, Natural Resources and Conservation Service Fraternity, Jan 2020 – Present

United Feminist Movement, Sept 2021 – Present

Active Minds, Sept 2020 - Present

Hobbies

Mix Martial Arts (Boxing, Kickboxing, Jujitsu), WeightLifting, Running, Tennis

Reading, Writing, Painting, Hiking, Travel