

# Nahyun Kwon

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College Station, TX, USA

## RESEARCH INTERESTS (SLIDES)

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### Human-Computer Interaction, Interactive System, Human-in-the-Loop

I design and develop **AI-powered interactive systems** to make technologies that change fast and require time to get knowledge more understandable and easy to explore for novices or inexperienced users. I wish to design interactive systems to make visual information more understandable and accessible for people. I design the DL model architectures to address real-world HCI problems especially on accessibilities, difficulties in using technologies, etc.

## EDUCATION

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- **Texas A&M University** TX, USA  
*Ph.D. Student - Computer Science, Advisor: Dr. Jeeun Kim, Co-advisor: Dr. Shu Kong Sep 2020 - Present*
- **Ewha Womans University** Seoul, Korea  
*B.S. - Computer Science, Advisor: Dr. Uran Oh Mar 2015 - Feb 2020*

## PUBLICATIONS

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- **[Under Review] Weedle: Towards Seamless, Composable, and Exploratory NLP on Computational Notebooks** Nahyun Kwon, Hannah Kim, Sajjadur Rahman, Dan Zhang, Estevam Hruschka. Submitted to IUI'23.
- **[Under Review] 3DPFIX: Community-Augmented AI-driven Design for Remote Novice's 3D Printing Troubleshooting.** Nahyun Kwon, Tong Sun, Yuyang Gao, Liang Zhao, Xu Wang, Jeeun Kim, Sungsoo Ray Hong. Submitted to CSCW'22. Poster
- **Multi-attach: Techniques to Enhance Multi-material Attachments in Low-cost FDM 3D Printing.** Nahyun Kwon\*, Himani Deshpande\*, Md Kamrul Hasan, Aryabhat Darnal, Jeeun Kim. In Proceedings of ACM Symposium on Computational Fabrication (SCF'21)
- **Touch Screen Exploration of Visual Artwork for Blind People.** Dragan Ahmetovic, Nahyun Kwon, Uran Oh, Cristian Bernareggi, Sergio Mascetti. In Proceedings of the Web Conference 2021 (WWW'21)
- **Supporting a Crowd-powered Accessible Online Art Gallery for People with Visual Impairments: A Feasibility Study.** Nahyun Kwon, Yunjung Lee, Uran Oh. Universal Access in the Information Society (2021)
- **3D4ALL: Toward an Inclusive Pipeline to Classify 3D Contents.** Nahyun Kwon, Chen Liang, Jeeun Kim. In Proceedings of the TExSS'21, Workshop on IUI'21.
- **Supporting Object-level Exploration of Artworks by Touch for People with Visual Impairments.** Nahyun Kwon, Youngji Koh, Uran Oh. In Proceedings of ACM SIGACCESS Conference on Computers and Accessibility (ASSETS'19). Poster Session.

## SKILLS

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Python/C/Java, Tensorflow/Keras, HTML/CSS/Javascript, D3.js, Git, Swift

## EXPERIENCE

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- **HCIED (HCI Engineering and Design) Lab, Texas A&M University** College Station, TX, USA  
*Ph.D. Student, Advisor: Dr. Jeeun Kim Sep 2020 - Present*
  - **Part-based Instance Detection for Spotting Inaccessibilities from Everyday Objects**
  - **Human-augmented AI to facilitate intelligent & interactive 3D printing troubleshooting**
  - **A human-in-the-loop pipeline for augmented learning** Reflecting various stakeholders' point of view with different backgrounds and perspectives in understanding the 3D content to mitigate personal biases by ensuring transparency and interpretability in the training process of a deep learning model
  - **Low-cost technique to increase the adhesion between different materials in 3D printing** Designed & developed algorithm that understands the geometric relation of polygons and creates interlocking structure, Implemented interactive tool that automatically creates desired structure inside the 3D model. Tech: Python, Flask
- **Megagon Labs** Mountain View, CA, USA  
*Research Intern, Mentor: Hannah Kim, Sajjadur Rahman, Dan Zhang, Estevam Hruschka Summer 2022*
  - **Project** interactive notebook widget for exploratory text analysis for NLP modeling. Tech: ipywidget, NLP techniques
  - **Contribution** Lead author. Defining design requirements and features for interactive system. Implementing python packages for text data analysis in a NLP domain
- **Alignment Lab, George Mason University** Fairfax, VA, USA (Remote)  
*Research Intern, Advisor: Dr. Ray Hong Summer 2021*
  - **AI-powered interactive 3D printing failure diagnosis & solution suggestion system for remote novice users** Trained multiple binary classification models for each 3D printing failure type. Tech: Pytorch
  - **Human-subject study** Designed online survey questionnaires, controlled lab study, and semi-structured interview. Qualitative & quantitative analysis. Tech: Kruskal-Wallis/Chi-square test, Power analysis
  - **Impact** Our system significantly improved remote novices' troubleshooting experience than their previous best practice

- **Human Computer Interaction Lab, Ewha Womans University** Seoul, Korea  
*Undergrad Research Intern, Advisor: Dr. Uran Oh* *Jan 2019 - Aug 2020*
  - **Improving 2D artwork accessibility for people with visual impairments** Collected crowdsourced artwork annotation and implemented VoiceOver-compatible web interface for spacial exploration of 2D artwork. Designed controlled lab study, and semi-structured interview. Tech: mTurk, D3.js
  - **Mobile gesture recognition for people with visual impairments** Implemented custom gestures for various functional zooming of screen on iOS for effective & rigorous exploration of image. Tech: Swift
- **WISHUPON Inc.** Seoul, Korea  
*Data Engineer Intern* *Winter 2018*
  - **Collecting up-to-date data of products in online shopping malls** Developed dynamic scraping modules for commercial data, so significantly reduced the amount of manual work. Tech: Python
  - **Commercial data analysis** Extracting repetitive patterns from data for automated classification of data
  - **Communication** Defined new error types of scraping system for better team communication. Tech: Jira, Bitbucket

## TEACHING & MENTORING

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- **Teaching Assistant**, Human-Computer Interaction - CSCE 436 (Spring 2022) @ TAMU
- **Research Mentoring**, Harsha Siripurapu (CS Undergrad, 2021), Muhammad Hasham Qazi (CS Undergrad, 2022)

## HONORS AND AWARDS

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- ACM CRA-W Grad Cohort, 2022
- TAMU CSE Travel Grant, 2021, 2022
- Ewha Future Capability Scholarship, Ewha Womans University, 2019
- Dean's List, Hanium ICT Mentoring Competition Award, Ewha Womans University, 2018

## VOLUNTEER EXPERIENCE

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- **Student Volunteer. IUI'21, CHI'22** Organized the paper sessions and resolved technical issues in virtual & in-person conference
- **Workshop Coordinator. TxHCI Seminar Series** Coordinated an interdisciplinary seminar across Texas institutions to foster an HCI community (Spring 2021)

Last Update: 12/13/2022