

JooYoung Seo

RSTUDIO INTERN FOR SUMMER 2020; PH.D. CANDIDATE (ABD)

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I am a learning scientist, software engineer, and internationally-certified accessibility professional.

Education

The Pennsylvania State University

PH.D. IN LEARNING, DESIGN, AND TECHNOLOGY

University Park, PA

Aug. 2016 - Present

- Expected graduation: May 2021.
- Dissertation Title: "Discovering Informal Learning Cultures of Blind Individuals Pursuing STEM Disciplines: A Quantitative Ethnography Using Public Listserv Archives."
- Committee members: Drs. Gabriela T. Richard (adviser; dissertation chair), Roy B. Clariana, ChanMin Kim, and Mary Beth Rosson.

The Pennsylvania State University

M.ED. IN LEARNING, DESIGN, AND TECHNOLOGY

University Park, PA

Aug. 2014 - May. 2016

- GPA 3.97/4.0.

Sungkyunkwan University

B.A. IN EDUCATION

Seoul, South Korea

Mar. 2009 - Feb. 2014

- GPA 4.08/4.50.

Sungkyunkwan University

B.A. IN ENGLISH LITERATURE

Seoul, South Korea

Mar. 2009 - Feb. 2014

- GPA 4.08/4.50.

Certificates

IBM and Coursera

WHAT IS DATA SCIENCE?

<https://www.coursera.org/account/accomplishments/ibm-data-science>

Feb. 2020 - Present

NV Access

CERTIFIED EXPERT WITH NVDA (NON-VISUAL DESKTOP ACCESS) SCREEN READER

Lucia South, QLD, Australia

Dec. 2019 - Present

International Association of Accessibility Professional

CERTIFIED PROFESSIONAL IN ACCESSIBILITY CORE COMPETENCIES

Atlanta, GA

Apr. 2017 - Present

Korean Ministry of Education

ENGLISH TEACHER CERTIFICATE FOR SECONDARY EDUCATION

Sejong, South Korea

Feb. 2014 - Present

Korean Ministry of Education

GENERAL EDUCATION TEACHER CERTIFICATE FOR SECONDARY EDUCATION

Sejong, South Korea

Feb. 2014 - Present

Working Experience

RStudio

SUMMER INTERN

Redmond, WA

May. 2020 - Aug. 2020

- Officially being offered summer intern position.
- Will work on accessibility improvement projects for Rstudio IDE and other Rstudio products.

ICE Soft

CO-FOUNDER AND PROJECT MANAGER

Seoul, South Korea

Jul. 2010 - Jun. 2011

- Co-founded and managed a start-up company to develop Android-based navigation App and assistive technology for blind people.
- Applied for and received a \$30,000 fund from the city of Seoul.

National Human Rights Commission of Korea

Seoul, South Korea

INTERN

May. 2010 - Nov. 2010

- Investigated illegal cases of discrimination against the disabled with regard to voting.
- Interviewed the disabled who had experienced discrimination against their voting rights.
- Produced written report for National Human Rights Commission of Korea.

Research Experience

IT Accessibility Team, Teaching and Learning with Technology (TLT)

University Park, PA

GRADUATE ASSISTANT

Aug. 2016 - Present

- Developing "Image ALT Text for HTML" and "Image ALT Text for Word" badges using the Penn State digital badges platform.
- Evaluating suitability of digital badges according to web content accessibility guidelines (WCAG) 2.0.
- Testing and consulting for accessible HTML5/CSS3 webpages for Penn State University sites and learning management tools (e.g., Angel, Canvas, Voice Thread, Adobe products, etc.)
- Engaged in a project for future research on making visualized statistical data accessible.
- Developed a package for statistical software R, called tactileR, which converts visual data into touchable graphs in conjunction with a Swell Form Heating Machine.

Playful Learning and Inclusive Design Research Group

University Park, PA

GRADUATE RESEARCHER

Aug. 2016 - Present

- Conducting interaction analysis and microethnographic studies for Dr. Gabriela Richard's inclusive gaming for learning and accessible makerspaces for youth with diverse background.

Online Interactions of the Blind Research Project

University Park, PA

PRINCIPAL INVESTIGATOR

May. 2019 - Present

- Conducting quantitative ethnography research on how blind learners pursue STEM disciplines as captured through a large-scale mailing list-servs.
- Using data science, computational linguistics (i.e., unsupervised machine learning for text mining; natural language processing) approaches coupled with conventional ethnographic methods.

Accessible RMarkdown Online Writer (AROW) Project, Teaching and Learning with Technology (TLT)

University Park, PA

PROJECT MANAGER

May. 2018 - Present

- Developed an accessible web application for people with dis/abilities to easily compose a high-quality scientific document based on LAMP, AJAX, R Markdown, and MathML.

Accessibility of Maker Toolkits Research Project

University Park, PA

PRINCIPAL INVESTIGATOR

Jun. 2017 - Present

- Conducting usability and design research on how to make current electronics and maker toolkits more accessible for learners with visual impairments.

Learning2CC Project

University Park, PA

SITE MANAGER

Feb. 2015 - Dec. 2015

- Participated in an ongoing learning community project for sharing tips for video caption for deaf learners.
- Developed Learning2CC, the online community site, using the WordPress platform.

Avenue PM Research Group

University Park, PA

GRADUATE RESEARCHER

Sep. 2014 - May. 2016

- Participated in Dr. Simon Hooper's grant project sponsored by the U.S. Department of Education Stepping Stones Phase II program.
- Improved web accessibility for deaf-blind learners by removing blockers on website platform.

The Ministry of Knowledge Economy and Seoul National University

Seoul, South Korea

STUDENT RESEARCHER

Feb. 2012 - Mar. 2012

- Visited various places in California, such as CSUN conference, museums, universities, and other public locations, to observe universal design products and services.
- Produced a comparison report on universal design products and services in Korea and the United States.
- Presented the report to the Quality of Life Technology team at Seoul National University.

Teaching Experience

IT Accessibility Team, Teaching and Learning with Technology (TLT)

University Park, PA

ACCESSIBILITY INSTRUCTOR

Mar. 2015 - Present

- Teaching over 30 staff members of the Penn State Accessibility team HTML5/CSS3/JavaScript coding and accessibility evaluation practice.

Publications

REFEREED JOURNAL PAPERS

- Seo, J.** (2019). Is the maker movement inclusive of ANYONE?: Three accessibility considerations to invite blind makers to the making world. *TechTrends*, 63(5), 514–520. <https://doi.org/10.1007/s11528-019-00377-3>
- Seo, J.**, & McCurry, S. (2019). LaTeX is not easy: Creating accessible scientific documents with r markdown. *Journal on Technology and Persons with Disabilities*, 7, 157–171.

PAPERS IN REFEREED CONFERENCE PROCEEDINGS

- Seo, J.**, & Richard, G. T. (in press-). Coding through touch: Exploring and re-designing tactile making activities with learners with visual dis/abilities. In M. Gresalfi & I. Horn (Eds.), *Interdisciplinarity in the learning sciences, 14th international conference of the learning sciences (icls) 2020*. International Society of the Learning Sciences (ISLS).
- Seo, J.** (2018). Accessibility and inclusivity in making: Engaging learners with all abilities in making activities. In *Proceedings of the 3rd learning sciences graduate student conference* (pp. 141–142). LSGSC Planning Team.
- Seo, J.**, & Richard, G. T. (2018). Accessibility, making and tactile robotics: Facilitating collaborative learning and computational thinking for learners with visual impairments. In J. Kay & R. Luckin (Eds.), *Rethinking learning in the digital age: Making the learning sciences count, 13th international conference of the learning sciences (icls) 2018* (Vol. 3, pp. 1755–1757). International Society of the Learning Sciences (ISLS).
- Konecki, M., Lovrenčić, S., **Seo, J.**, & LaPierre, C. (2017). The role of ict in aiding visually impaired students and professionals. *Proceedings of the 11th Multidisciplinary Academic Conference*, 148.
- Seo, J.**, AlQahtani, M., Ouyang, X., & Borge, M. (2017). Embracing learners with visual impairments in cscl. In B. K. Smith, M. Borge, E. Mercier, & K. Y. Lim (Eds.), *Making a difference: Prioritizing equity and access in cscl, 12th international conference on computer supported collaborative learning (cscl) 2017* (Vol. 2). International Society of the Learning Sciences (ISLS).
- Seo, J.** (2019). Discovering informal learning cultures of blind individuals pursuing stem disciplines: A quantitative ethnography using listserv archives. *The First International Conference on Quantitative Ethnography: Doctoral Consortium*, S66–S67.

PUBLICATIONS IN HEALTHCARE

- I have contributed to the following publications for their methods and research designs.
- Choi, S., & **Seo, J.** (in press-). An exploratory study of the research on caregiver depression: Using bibliometrics and lda topic modeling. *Issues in Mental Health Nursing*. <https://doi.org/10.1080/01612840.2019.1705944>
- Choi, S., & **Seo, J.** (2019). Analysis of caregiver burden in palliative care: An integrated review. *Nursing Forum*, 54(2), 280–290. <https://doi.org/10.1111/nuf.12328>
- Choi, S., & **Seo, J.** (2019). Heart failure research using text mining: A systematic review. *NURSING RESEARCH*, 68(2), E119–E120.
- Choi, S., & **Seo, J.** (2019). Trends in self-management among adults with heart failure from 2011 to 2016 using the national health and nutrition examination surveys. *Journal of Cardiac Failure*, 25(8), S4. <https://doi.org/10.1016/j.cardfail.2019.07.540>
- Choi, S., & **Seo, J.** (2018). Effects of nonpharmacological interventions for fatigue in patients with heart failure: A systematic review and meta-analysis. *Journal of Cardiac Failure*, 24(8), S73–S74.
- Choi, S., **Seo, J.**, & Kitko, L. (2019). Exploring the lived experience of a family member with advanced heart failure: Using a text mining approach. *The First International Conference on Quantitative Ethnography: Poster Session*, S8–S9.

Presentations

PEER-REVIEWED CONFERENCE PRESENTATIONS

- Seo, J.**, & Richard, G. T. (2020, June). *Coding through touch: exploring and re-designing tactile making activities with learners with visual dis/abilities*. Paper will be presented at the 14th International Conference of the Learning Sciences (ICLS), Nashville, TN.
- Seo, J.**, & Richard, G. T. (2020, April). *Maker inclusivity = maker accessibility: further interrogations for diverse participation*. Poster will be presented at the annual meeting of the American Educational Research Association (AERA), San Francisco, CA.
- Seo, J.** (2019, October). *Discovering informal learning cultures of blind individuals pursuing STEM disciplines: a quantitative ethnography using listserv archives*. Poster presented at the Doctoral Consortium of the first International Conference on Quantitative Ethnography (ICQE), Madison, WI. *Awarded the best doctoral proposal fellowship*.
- Seo, J.**, & McCurry, S. (2019, March). *LaTeX is NOT easy: creating accessible scientific documents with R markdown*. Paper presented at the annual meeting of the CSUN Assistive Technology Conference, Northridge, CA.
- Seo, J.** (2018, October). *Accessibility and inclusivity in making: engaging learners with all abilities in making activities*. Paper presented at the annual meeting of the Learning Sciences Graduate Student Conference (LSGSC), Nashville, TN.
- Seo, J.**, & Richard, G. T. (2018, June). *Accessibility, making and tactile robotics: facilitating collaborative learning and computational thinking for learners with visual impairments*. Poster presented at the 13th International Conference of the Learning Sciences (ICLS), London, UK.
- Seo, J.**, & Richard, G. T. (2018, April). *Furthering inclusivity in making: a framework for accessible design of makerspaces for learners with disabilities*. Poster presented at the annual meeting of the American Educational Research Association (AERA), New York City, NY.
- Bunag, T., Aniela, L., Nielsen, M. C., & **Seo, J.** (2017, November). *The rapidly changing world of accessible online learning*. Presented at the Panel Discussion: DDL - Accessible Online Learning In Concurrent Presentation of the Association for Educational Communications and Technology (AECT), Jacksonville, FL.
- Seo, J.** (2017, September). *Tactile access to visualized statistical data using R*. Poster presented at the annual meeting of the ACM Richard Tapia Celebration of Diversity in Computing, Atlanta, GA.
- Seo, J.**, AlQahtani, M., Ouyang, X., & Borge, M. (2017, June). *Embracing learners with visual impairments in CSCL*. Paper presented at the 12th International Conference on Computer Supported Collaborative Learning (CSCL), Philadelphia, PA.
- Liao, J., Patcyk, M., **Seo, J.**, & Hooper, S. (2016, October). *Using hierarchical linear modeling to measure growth rate in a gamified CBM environment*. Paper presented at the annual meeting of the Northeastern Educational Research Association (NERA), Trumbull, CT.
- Seo, J.** (2016, March). *Engaging blind learners in statistics study using R*. Presented at the annual meeting of the Teaching and Learning with Technology (TLT) Symposium, University Park, PA.
- Kim, K., **Seo, J.**, & Clariana, R. B. (2016, March). *Automatic knowledge structure measure in online courses*. Presented at the annual meeting of the Teaching and Learning with Technology (TLT) Symposium, University Park, PA.
- Seo, J.** (2015, November). *Assistive technologies for equal access in general education*. Presented at the annual meeting of the Association for Educational Communications and Technology (AECT), Indianapolis, IN.
- Seo, J.**, & Park, E. (2015, October). *The more accessible, the more potential: simple tips for online accessibility*. Presented at the Technology and Learning Conference, Blue Bell, PA.

Software Developments and Publications

DATA SCIENCE PACKAGES IN COMPREHENSIVE R ARCHIVE NETWORK (CRAN)

- Seo, J.**, & Choi, S. (2020). *Youtubecaption: Downloading youtube subtitle transcription in a tidy tibble data frame*. <https://CRAN.R-project.org/package=youtubecaption>

Seo, J., & Choi, S. (2019). *Ezpickr: Easy data import using gui file picker and seamless communication between an excel and r*. <https://CRAN.R-project.org/package=ezpickr>

Seo, J., & Choi, S. (2019). *Mboxr: Reading, extracting, and converting an mbox file into a tibble*. <https://CRAN.R-project.org/package=mboxr>

OPEN-SOURCE PROJECT ON GITHUB

Seo, J. (2019). *Edmdown: Writing a reproducible article for journal of educational datamining in r markdown*. <https://github.com/jooyoungseo/edmdown>

Seo, J. (2019). *Ezviewr: View tidy data in preferable spreadsheet*. <https://github.com/jooyoungseo/ezviewr>

Seo, J. (2019). *Jladow: Writing a reproducible article for journal of learning analytics in r markdown*. <https://github.com/jooyoungseo/jladow>

Seo, J. (2019). *TactileR: Converting r graphics into a braille ready-to-print pdf*. <https://github.com/jooyoungseo/tactileR>

Seo, J., & McCurry, S. (2019). *AROW: Accessible rmarkdown online writer*. <http://www.arowtool.com>

OFFICIALLY CODE_CONTRIBUTING R PACKAGES

- My 18 GitHub pull requests have been peer-reviewed and merged for active data science R packages:

Allaire, J., Xie, Y., et al.

RMARKDOWN: DYNAMIC DOCUMENTS FOR R

- Contributed to improving ioslides_presentation accessibility for screen reading software.

<https://cran.r-project.org/web/packages/rmarkdown/>
2019

Xie, Y.

BOOKDOWN: AUTHORING BOOKS AND TECHNICAL DOCUMENTS WITH R MARKDOWN

- Developed context_document2, github_document2, beamer_presentation2, html_fragment2, html_notebook2, html_vignette2, ioslides_presentation2, slidy_presentation2 and rtf_document2 functions to enable R markdown users to utilize cross-references for figures and tables through bookdown package.

<https://cran.r-project.org/web/packages/bookdown/>
2019

Allaire, J., Iannone, R., & Xie, Y.

DISTILL: 'R MARKDOWN' FORMAT FOR SCIENTIFIC AND TECHNICAL WRITING

- Contributed to displaying more metadata for journal article bib_entries.
- Improved screen reader accessibility for navigation bar.
- Added missing Google Scholar meta tags for conference, technical report, and dissertation types.

<https://cran.r-project.org/web/packages/distill/>
2019

Marwick, B.

WORDCOUNTADDIN: WORD COUNTS AND READABILITY STATISTICS IN R MARKDOWN DOCUMENTS

- Contributed text_stats() function for R markdown users to Get a word count and some other stats for selected text (excluding code chunks and inline code).

<https://github.com/benmarwick/wordcountaddin>
2019

Godfrey, A. J. R., Warren, D., Murrell, P., Bilton, T., & Sorge, V.

BRAILLER: IMPROVED ACCESS FOR BLIND USERS

- Contributed BRLThis() function to enable blind R users to convert a graph into a pdf ready for embossing in Braille.

<https://cran.r-project.org/web/packages/BrailleR/>
2019

Awards and Honors

AccessComputing, University of Washington

ACCESSSTEM RESUME CONTEST WINNERS AWARD

- Sponsored by The National Science Foundation (NSF).

Seattle, WA

Dec. 2019

The First International Conference on Quantitative Ethnography

BEST DOCTORAL PROPOSAL FELLOWSHIP

- Sponsored by Cengage.

Madison, WI

Oct. 2019

The PDK Educational Foundation

ANDREW V. KOZAK MEMORIAL FELLOWSHIP

- 1500

University Park, PA

2019

The Spencer Foundation

AERA PRE-CONFERENCE TRAVEL AWARD

Toronto, ON, Canada

Apr. 2019

The Pennsylvania State University

DELTA GAMMA GOLDEN ANCHOR AWARD

University Park, PA

2017

The Pennsylvania State University

DELTA GAMMA GOLDEN ANCHOR AWARD

University Park, PA

2015

The National Science Foundation (NSF)

ACM RICHARD TAPIA CELEBRATION OF DIVERSITY IN COMPUTING CONFERENCE SCHOLARSHIP

Atlanta, GA

Sep. 2017

- Included free conference registration, shared hotel accommodations and a \$500 travel stipend.

Microsoft Research

ACM STUDENT RESEARCH COMPETITION TRAVEL AWARD

Atlanta, GA

Sep. 2017

- \$500 travel stipend was awarded for ACM TAPIA 2017 Student Research Competition (SRC).

AccessComputing, University of Washington

CSUN CONFERENCE TRAVEL AWARD

Seattle, WA

Mar. 2017

- Sponsored by The National Science Foundation (NSF).

College of Education

SUMMER TUITION ASSISTANCE FUNDING

University Park, PA

2017

College of Education

GRADUATE STUDENT TRAVEL GRANT

University Park, PA

Aug. 2016 - Present

Teaching and Learning with Technology

GRADUATE ASSISTANTSHIP

University Park, PA

Aug. 2016 - Present

Hyomyoung Scholarship

OUTSTANDING ACADEMIC AWARD

Seoul, South Korea

2014 - 2019

ChungInwook Scholarship Foundation

ACADEMIC SCHOLARSHIP FOR DOCTORAL RESEARCH

Seoul, South Korea

2016 - 2018

ANC Scholarship Foundation

ALL NATIONS CHURCH GRADUATE SCHOLARSHIP

Lake View Terrace, CA

2016

National Institute for International Education, Korean Government

FUTURE INTERDISCIPLINARY STUDY OF GLOBAL KOREA SCHOLARSHIP FOR MASTER'S RESEARCH

Seoul, South Korea

2014 - 2016

Sungkyunkwan University

ACADEMIC ACHIEVEMENT SCHOLARSHIP

Seoul, South Korea

2009 - 2013

Grants

College of Education, The Pennsylvania State University

DISSERTATION RESEARCH INITIATION GRANT

University Park, PA

Feb. 2020 - Dec. 2020

- Selected as one of the 10 outstanding dissertation research proposals in 2019-2020 academic year.
- Funding amount: \$600.

Center for Online Innovation in Learning, The Pennsylvania State University

PROVIDING TOUCHABLE KNOWLEDGE STRUCTURE GRAPHIC FEEDBACK FOR BLIND ONLINE LEARNERS: TABLET-BASED HAPTIC

University Park, PA

FEEDBACK AND PAPER-BASED TACTILE FEEDBACK

Mar. 2016 - Aug. 2017

- Co-led (Co-PI) a development project funded by Penn State to provide blind online learners with accessible network graphs that measure students' knowledge structure.
- Developed a prototype website and mobile app for accessible knowledge structure.
- Funding amount: \$33,060.

Seed Funding for Start-Up Company for the Youth, City of Seoul

ICE SOFT: I SEE EVERYTHING THROUGH ASSISTIVE TECHNOLOGY

Seoul, South Korea

Jul. 2010 - Jun. 2011

- Co-Founded and Project-Managed ICE Soft.
- Worked with a team and developed an gps app for the blind.
- Funding amount: \$30,000 USD.

INVITED GUEST LECTURES

EIT Accessibility Group, The Pennsylvania State University

University Park, PA

BLOCKERS FOR USERS ON A SCREEN READER

Oct. 2019

- Invited guest talk to a webinar to train Penn State instructional designers for key WCAG 2.1 guidelines to make content more accessible including: image alt text, clear link text and heading structure, proper table structure, form and button labels, the need for keyboard functionality and how to convey information regardless of visual formatting.

Chonnam National University

Gwangju, South Korea

A SMALL STEP TO TAKE YOUR DATA ANALYSIS TO ANOTHER LEVEL

Jul. 2019

- Invited guest talk to CNU to teach nursing faculty and students for basic concept of machine learning, computer-assisted text mining, and topic modelling to improve their qualitative data reliability.

Sungkyunkwan University

Seoul, South Korea

BEING A REASONABLE REALIST: WISE NEGOTIATION BETWEEN GIVE AND TAKE

Jun. 2019

- Invited guest talk to SKKU "Student Success Center" as one of the successful role models to inspire undergraduate students for future planning.

The MathML Meeting, The Pennsylvania State University

University Park, PA

ACCESSIBILITY OF MATH, STATISTICS, AND SOCIAL SCIENCES

May. 2019

- Invited guest talk to Penn State MathML group to present assistive technology and accessibility for STEM content.

BBVS Summer Academy STEM Extension

University Park, PA

KEY-NOTE SPEECH FOR STEM EXTENSION

Jul. 2018

- Invited key-note speaker to the STEM (Science, Technology, Engineering, and Mathematics) week of "The Summer Academy for Students who are Blind or Visually Impaired."
- Hosted by the Pennsylvania Department of Labor and Industry, Office of Vocational Rehabilitation's Bureau of Blindness and Visual Services, in partnership with the Pennsylvania Department of Education, Bureau Of Special Education's Pennsylvania Training and Technical Assistance Network and Pennsylvania State University's College of Education and College of Health and Human Development.

LDT 100 - "World Technologies and Learning", The Pennsylvania State University

University Park, PA

ADAPTIVE TECHNOLOGY LESSON

Apr. 2018

- Two times invited guest talk to Dr. Joshua Kirby's class for the week of "The Cost of 21st Century Education."

LDT First Friday Speaking Series, The Pennsylvania State University

University Park, PA

UNIVERSAL DESIGN 101: THREE FUNDAMENTAL FRAMEWORKS FOR AN EQUITABLE WORLD

Apr. 2017

- Invited guest talk to the Learning, Design, and Technology (LDT) program of Penn State to introduce theoretical and practical background of Universal Design for Learning.

Northwestern University

Evanston, IL

INCLUSIVE MAKING

Oct. 2017

- Invited guest talk to Dr. Marcelo Worsley's "Inclusive Making" class for Learning Sciences Program.

The Accessibility Users Group, The Pennsylvania State University

University Park, PA

ACCESSIBILITY TESTING USING NVDA

Jul. 2017

- Invited guest talk to the Penn State online learning Accessibility User Group to train web accessibility testing with open-source screen reader NVDA.

Canvas Day 17

University Park, PA

NON-VISUAL ACCESS TO CANVAS WITH ASSISTIVE TECHNOLOGY

Mar. 2017

- Invited guest to a showcase of Canvas, a learning management tool, to demonstrate how to interact with the online system using assistive technology for students with disabilities.

Ed-ICT International Network: Disabled students, ICT, post-compulsory education & employment

Seattle, WA

STUDENT PANEL DISCUSSION: STUDENT ISSUES

Mar. 2017

- Invited student panel to the first Ed-ICT International Network symposium.

Korea Employment Promotion Agency for the Disabled

Gyeonggi, South Korea

ACCESSIBILITY: THE FIRST STEP TOWARDS ABILITY

Jul. 2016

- Invited guest talk to KEAD to train the employees in concept of accessibility and universal design.