

JooYoung Seo

PH.D.

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

Education

The Pennsylvania State University

University Park, PA

PH.D. IN LEARNING, DESIGN, AND TECHNOLOGY

2021

- Dissertation Title: "Discovering Informal Learning Cultures of Blind Individuals Pursuing STEM Disciplines: A Computational 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

University Park, PA

M.ED. IN LEARNING, DESIGN, AND TECHNOLOGY

2016

Sungkyunkwan University

Seoul, South Korea

DOUBLE B.A. IN EDUCATION, ENGLISH LITERATURE

2014

Professional Appointment

School of Information Sciences

University of Illinois at

Urbana-Champaign

ASSISTANT PROFESSOR

Sep. 2021 - Present

National Center for Supercomputing Applications

University of Illinois at

Urbana-Champaign

FACULTY AFFILIATE

Dec. 2021 - Present

Illinois Informatics Institute

University of Illinois at

Urbana-Champaign

FACULTY AFFILIATE

Sep. 2021 - Present

IDEA (Inclusion, Diversity, Equity, and Access) Institute

University of Illinois at

Urbana-Champaign

FACULTY AFFILIATE

Jan. 2022 - Present

RStudio

Boston, MA

SOFTWARE ENGINEER INTERN

May. 2020 - Aug. 2020

Certificates

RStudio PBC

DOUBLE-CERTIFIED DATA SCIENCE INSTRUCTOR FOR TIDYVERSE AND SHINY

Jun. 2020 - Present

NV Access

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

Dec. 2019 - Present

International Association of Accessibility Professional

CERTIFIED PROFESSIONAL IN ACCESSIBILITY CORE COMPETENCIES

Apr. 2017 - Present

Korean Ministry of Education

LICENSED ENGLISH TEACHER (SECONDARY EDUCATION)

Feb. 2014 - Present

Korean Ministry of Education

LICENSED GENERAL EDUCATION TEACHER (SECONDARY EDUCATION)

Feb. 2014 - Present

Publications

- The following notations only apply to September 2021 and after.

#: derived from the candidate's thesis.

*: publication that has undergone stringent editorial review by peers.

+: publication that was invited and carries special prestige and recognition.

REFEREED JOURNAL PAPERS

1. * **Seo, J.**, & Choi, S. (in press). Are blind people considered a part of scientific knowledge producers?: Accessibility report on top-10 SCIE journal systems using a tripartite evaluation approach. *Journal on Technology and Persons with Disabilities*.
2. * **Seo, J.**, Moon, J., Choi, G. W., & Do, J. (2022). A Scoping Review of Three Computational Approaches to Ethnographic Research in Digital Learning Environments. *TechTrends*, 66(1), 102–111. <https://doi.org/10.1007/s11528-021-00689-3>
3. Choi, S., & **Seo, J.** (2021). Trends in healthcare research on visual impairment and blindness: Use of bibliometrics and hierarchical cluster analysis. *Ophthalmic Epidemiology*, 28(4), 277–284. <https://doi.org/10.1080/09286586.2020.1863993>
4. * **Seo, J.**, & Richard, G. T. (2021). SCAFFOLDing All Abilities into Makerspaces: A Design Framework for Universal, Accessible and Intersectionally Inclusive Making and Learning. *Information and Learning Sciences*, 122(11/12), 795–815. <https://doi.org/10.1108/ILS-10-2020-0230>
5. **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>
6. * **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

1. * Huh, M., & **Seo, J.** (in press). A duoethnographic study of a mixed-ability team in a collaborative group programming project. In *Proceedings of the 15th international conference on computer supported collaborative learning (CSCCL), 2022*. International Society of the Learning Sciences (ISLS).
2. * **Seo, J.**, & Dogucu, M. (accepted). Teaching visual accessibility in the introductory data science classes: Why, what, when, and how. *The 2022 Symposium on Data Science & Statistics*.
3. * Lee, C. Y. P., Zhang, Z., Herskovitz, J., **Seo, J.**, & Guo, A. (2022). CollabAlly: Accessible Collaboration Awareness in Document Editing. *CHI Conference on Human Factors in Computing Systems*, 1–17. <https://doi.org/10.1145/3491102.3517635>. Honorable mention award.
4. * Lee, C. Y. P., Zhang, Z., Herskovitz, J., **Seo, J.**, & Guo, A. (2021). CollabAlly: Accessible collaboration awareness in document editing. *The 23rd International ACM SIGACCESS Conference on Computers and Accessibility*, 1–4. <https://doi.org/10.1145/3441852.3476562>
5. **Seo, J.**, & Richard, G. T. (2020). 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* (Vol. 3, pp. 1373–1380). International Society of the Learning Sciences (ISLS).
6. **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. Awarded the best Doctoral Consortium Proposal Cengage fellowship.
7. **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.
8. **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).
9. 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.

10. **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, pp. 573–576). International Society of the Learning Sciences (ISLS).

PUBLICATIONS IN HEALTHCARE

1. Choi, S., & **Seo, J.** (2020). An exploratory study of the research on caregiver depression: Using bibliometrics and LDA topic modeling. *Issues in Mental Health Nursing*, 1–10. <https://doi.org/10.1080/01612840.2019.1705944>
2. 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>
3. Choi, S., & **Seo, J.** (2019). Heart failure research using text mining: A systematic review. *NURSING RESEARCH*, 68(2), E119–E120.
4. 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>
5. 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.
6. 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.

WORKING PAPERS UNDER REVISION OR REVIEW

1. Zhang, Z., Kaushik, S., **Seo, J.**, Yuan, H., Das, S., Findlater, L., Gurari, D., Stangl, A., & Wang, Y. (resubmission preparation). *ImageAlly: A Human-AI Hybrid Approach to Support Blind People*.
2. Moon, J., Lee, D., Choi, G. W., **Seo, J.**, Do, J., & Lim, T. (in preparation). *Learning analytics in seamless learning environments: A systematic review*.

Conference Presentations and Invited Talks

Seo, J. (2021, October). *Non-Visual Strategies for Making Statistical-Computing Accessible*. Lightning talk at the National Center for Supercomputing Applications, Champaign, IL.

Seo, J. (2021, September). *Accessibility of Science Beyond Content Accessibility*. Talk presented at the Argonne National Laboratory (Maths and Computer Science Division): <https://www.anl.gov/event/accessibility-of-science-beyond-content-accessibility>.

Invited panel (2021, August). DO-IT Neuroscience for Neurodiverse Learners Faculty panel at the University of Washington, virtual.

Seo, J. (2021, June). *How to Learn to Code*. Invited Talk presented at the Nature, Webcast: <https://doi.org/10.1038/d41586-021-01638-z>.

Seo, J., & Richard, G. T. (2021, February). *Uncovering latent topics of blind people in computer science: structural topic modeling for an email corpus*. Poster presented at the 2nd International Conference on Quantitative Ethnography (ICQE), Malibu, CA.

Donegan, S. R., Porter, C., Fogel, A., **Seo, J.**, Choi, S., & Eagan, B. (2021, February). *U.S. media coverage during COVID-19: an epistemic network analysis of bias, topic, and trajectory*. Poster presented at the 2nd International Conference on Quantitative Ethnography (ICQE), Malibu, CA.

Seo, J. (2021, January). *Accessible data science beyond visual models*. Talk presented at the rstudio::global(2021), Virtual: <https://global.rstudio.com/student/page/40617>.

Seo, J. (2020, September). *Discovering knowledge sharing patterns of blind people pursuing STEM disciplines: data science and computational linguistics on large-scale email corpora*. Poster presented at the Doctoral Consortium of

the annual meeting of the ACM Richard Tapia Celebration of Diversity in Computing, virtual. *Awarded the Qualcomm scholarship.*

Seo, J., & Richard, G. T. (2020, April). *Maker inclusivity = maker accessibility: further interrogations for diverse participation.* Poster presented at the annual meeting of the American Educational Research Association (AERA), Virtual.

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.

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)

1. **Seo, J.,** & Choi, S. (2020). *Youtubecaption: Downloading YouTube subtitle transcription in a tidy tibble data frame.* <https://CRAN.R-project.org/package=youtubecaption>. Over 9543 download.

2. **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>. Over 19K download.

3. **Seo, J.,** & Choi, S. (2019). *Mboxr: Reading, extracting, and converting an mbox file into a tibble.* <https://CRAN.R-project.org/package=mboxr>. Over 15K download.

OPEN-SOURCE PROJECT ON GITHUB

1. **Seo, J.** (2020). *Edmdown: Writing a reproducible article for journal of educational DataMining in r markdown*. <https://github.com/jooyoungseo/edmdown>. R package version 0.0.0.9000.
2. **Seo, J., Chan, T., Michaelis, J. E., & Rosenberg, J. M.** (2020). *IsIsdown: Writing a reproducible conference paper for the international society of the learning sciences annual meeting in r markdown*. <https://github.com/jooyoungseo/isIsdown>. R package version 0.0.0.9000.
3. **Seo, J., & Rosenberg, J. M.** (2020). *Jlardown: Writing a reproducible article for journal of learning analytics in r markdown*. <https://github.com/jooyoungseo/jlardown>. R package version 0.0.0.9000.
4. **Seo, J.** (2019). *Ezviewr: View tidy data in preferable spreadsheet*. <https://github.com/jooyoungseo/ezviewr>. R package version 0.1.0.
5. **Seo, J.** (2019). *tactileR: Converting r graphics into a braille ready-to-print PDF*. <https://github.com/jooyoungseo/tactileR>. R package version 0.1.0.
6. **Seo, J., & McCurry, S.** (2019). *AROW: Accessible RMarkdown online writer*. <http://www.arowtool.com>

OFFICIALLY CODE_CONTRIBUTING R PACKAGES

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

Chang, W., Cheng, J., Allaire, J., Xie, Y., & McPherson, J.

SHINY: WEB APPLICATION FRAMEWORK FOR R

- Contributed to improving keyboard and TTS accessibility for input widgets.

<https://cran.r-project.org/web/packages/shiny/>
2020

O'Hara-Wild, M., & Hyndman, R.

VITAE: CURRICULUM VITAE FOR R MARKDOWN

- Contributed to enabling LaTeX engine customization.
- Contributed to displaying multiple bibliographies based on lua filter.

<https://cran.r-project.org/web/packages/vitae/>
2020

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 to 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://git.io/JkJca>
2019

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

BRAILLER: IMPROVED ACCESS FOR BLIND USERS

- Contributed to 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

Teaching Experience

- IS 407: Introduction to Data Science (spring 2022).
- IS 569: Internship (spring 2022). *Advised Ankita Khiratkhar (MS IM).*
- IS 589: Independent Study (spring 2022). *Advised Chetna Beri (MS IM).*
- INFO 399: Individual Study (spring 2022). *Advised Leo Zhang (CS undergrad → Currently, Master's student at UCLA Data Science dept).*
- IS 389: Independent Study (spring 2022). *Advised Miso Kim (BS IS).*
- IS 226: Introduction to Human-Computer Interaction (fall 2021). *Co-teaching with Dr. Yang Wang.*
- Served as an annual review committee member for iSchool Ph.d. student Smirity Kaushik (advisor Dr. Yang Wang) (spring 2022).
- Served as a field exam committee member for iSchool Ph.D. candidate Jaihyun Park (advisor Dr. Ryan Cordell) (spring 2022).

Grants

Seo, J. (PI) (submitted for May 2022 - May 2023). Improving Accessible Reproducibility for Data Science Publishing System. *RStudio PBC*. Requested funding amount: \$54,327.

Ludäscher, B. (PI), **Seo, J.** (Co-PI), & Vilhuber, L. (Co-PI) (submitted for Aug 2022 - Aug 2023). Whole Tale Accessibility Project. *The Sloan Foundation*. Requested funding amount: \$225,000.

Choi, S. (PI), **Seo, J.** (Co-PI), Mahoney, M. (Co-PI), Davies, C. (Co-PI) (submitted for July 2022 - December 2023). Understanding the Sleep Patterns of Blind Populations Using Self-Tracking Technologies - What is It Like and How can We Support It?. *The Center on Health, Aging, and Disability, College of Applied Health Sciences*. Requested funding amount: \$30,000.

Seo, J. (PI), & Koh, K. (Co-PI) (submitted for Aug 2022 - May 2025). Promoting Computational Thinking Skills for Blind and Visually Impaired Teens through Accessible Library Makerspaces. *IMLS (Institute of Museum and Library Services) National Leadership Grants for Libraries*. Requested funding amount: \$498,638.

Seo, J. (PI) (awarded: unrestricted beyond Jan 2022 - December 2022). Data Accessibilization: Making Data Science Education Accessible for Blind Learners. *Wallace Foundation grant, Emerging Scholars Program of the International Society of the Learning Sciences (ISLS)*. Awarded funding amount: \$10,000.

Awards and Honors

ACM Richard Tapia Celebration of Diversity in Computing Conference

QUALCOMM SCHOLARSHIP

- Selected as one of the outstanding doctoral consortium proposals.

Virtual
Sep. 2020

Disability:IN

2020 NEXTGEN LEADERS

- Selected as one of the leaders in the U.S. for diversity.

Alexandria, VA
Feb. 2020 - Jul. 2020

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

- Awarded \$1,500 for research contribution to public education.

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

2015, 2017

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

ANC Scholarship Foundation

ALL NATIONS CHURCH GRADUATE SCHOLARSHIP

Lake View Terrace, CA

2016

Service

School of Information Sciences at the University of Illinois at Urbana-Champaign

SEARCH COMMITTEE FOR DIRECTOR/ASSISTANT DEAN, DIVERSITY, EQUITY, INCLUSION, AND ACCESSIBILITY (DEIA)

Champaign, IL

April 2022 - Present

School of Information Sciences at the University of Illinois at Urbana-Champaign

DIVERSITY COMMITTEE

Champaign, IL

Sep. 2021 - Apr. 2022

International Web for All Conference (W4A) 2022

PROGRAM COMMITTEE MEMBER

Virtual

Dec. 2021 - Feb. 2022

15th International Conference on Educational Data Mining

ACCESSIBILITY CHAIR

Durham

Oct. 2021 - Jul. 2022

Special issue on ethnography and learning design

JOURNAL REVIEWER

TechTrends

Sep. 2021

The Network of Academic Programs in the Learning Sciences (NAPLeS)

REVIEWER

International Society of the Learning
Sciences

2020

- Reviewed abstracts on equity and disability.

The Pennsylvania State University

COLLEGE OF EDUCATION TECHNOLOGY COMMITTEE

University Park, PA

Aug. 2019 - May. 2020

- Worked as a student committee member to support understanding of educational technology for College of Education.

The Pennsylvania State University

LIBRARIES' ACCESSIBILITY STUDENT ADVISORY GROUP

University Park, PA

Aug. 2019 - May. 2020

The 14th International Conference of the Learning Sciences (ICLS)

REVIEWER

Nashville, TN

2019

The ACM CHI Conference on Human Factors in Computing Systems (CHI 2020, 2021)

REVIEWER

Honolulu, HI, Yokohama, Japan

2019, 2020

The 1st International Conference on Quantitative Ethnography (ICQE)

REVIEWER

Madison, WI

2019

The 3rd Learning Sciences Graduate Student Conference (LSGSC)

REVIEWER

Nashville, TN

2018

Current Memberships

- International Society of the Learning Sciences (ISLS)
- Association for Computing Machinery (ACM)
- American Statistical Association (ASA)
- International Society for Quantitative Ethnography (ISQE)
- International Association of Accessibility Professionals (IAAP)
- International Educational Data Mining Society (IEDMS)