

Training Future Faculty in Library, AI, and Data Driven Education and Research (LADDER)

1. Project Justification

Libraries need to help shape the future of artificial intelligence (AI) and data science research and practice (Li & Fleischmann, 2020). AI and data science have broad societal implications, ranging from algorithms used to review job applications to those used for sentencing recommendations.

Unfortunately, these algorithms are also subject to bias (O’Neil, 2016), such as the gender bias found in Amazon’s discarded job application review system and the racism found by ProPublica in the COMPAS system that is used by judges to inform prison sentence determinations (Angwin et al., 2016). Given that libraries are one of the few accessible institutions for the general public to engage with new information technologies (in schools, in their communities, or in academia) with trained information professionals present to guide their use of these technologies, it is critical to ensure that future librarians receive the best education in AI and data science possible (Lankes, 2019). This requires faculty with AI and data science domain expertise as well as experience in the library context.

While many current accredited library and information science (LIS) programs have AI and data science faculty and offer courses in the topic, there is a gap between the faculty, courses, and the library domain. Faculty with core knowledge of these highly technical fields tend to come from backgrounds in technology and computer science, having little or no experience in librarianship. This creates a real and perceived disconnect between instructors and library and information science students who often focus on service and library skills. Moreover, a lack of experience and sensitivity to library norms makes providing relevant instruction, context, and assignments in their courses difficult. Put simply, the content in AI and data science is often inaccessible to LIS students because there is no common frame with which to scaffold instruction (Federer et al., 2020).

We aim to educate future LIS faculty who can teach new librarians how to best develop, apply, and use AI in libraries in ways that are equitable, ethical, and effective. We also aim to educate next generation LIS scholars who are familiar with the implications of data science in libraries and thus support the Laura Bush 21st Century Librarian Program Goal 2, “Develop faculty, library, and archives leaders by increasing the institutional capacity of libraries, archives, and graduate programs related to library and information science.” We particularly focus on achieving Objective 2.3 to “Support the research of untenured tenure-track library and information science faculty, furthering the faculty member’s long-term research agenda, career trajectory, and professional development.” By preparing future LIS faculty, IMLS’s investment will pay dividends for decades to come.

Our proposed project aligns with the objective of IMLS projects such as LEADS-4-NDP – LIS Education and Data Science for the National Digital Platform (RE-70-17-0094-17) and LEADING – LIS Education and Data Science-Integrated Network Group (RE-246450-OLS-20). These important programs provide valuable learning opportunities for current LIS doctoral students in data science. Our proposed project, however, takes an alternative but complementary approach by selecting students who already have domain expertise in AI and data science and embedding them in the library context versus trying to instill data and AI expertise within library-oriented students. Thus, our project provides a new pathway for training the next generation of LIS faculty. It also creates the conditions for engaging the AI and data science research community in issues and examples from the library ecosystems, ensuring that libraries play a critical role in the future of AI.

Our project seeks to answer three research questions: How can we ensure that libraries play a leading role in advancing AI and data science? How can we staff LIS faculty with AI and data science researchers/educators who situate their research and education in the library setting? How can we design

and implement a training program for LIS doctoral students that brings in students with AI and data science skills and trains them in leveraging this expertise in the library setting?

In the proposed project, we will train three cohorts of future LIS faculty who will have expertise in the application of AI and data science to libraries. This project will increase the capacity of library and information science programs to educate the librarians of tomorrow by preparing cohorts of outstanding future faculty who understand both cutting-edge technology and the unique service environment of libraries. These cohorts will teach and conduct research in the library environment, ensuring librarians help to drive the conversation and debates that shape AI and data science.

LIS scholars should have applied education experiences in which they will be trained across three areas of expertise: research, professional engagement, and teaching. Importantly, they will engage in authentic research problems grounded in real library contexts and work collaboratively with librarians. The resulting portfolio of published research projects; advising; attending and presenting at conferences such as ALA, ALISE, and ASIS&T; support from the PIs with a track record of LIS faculty placement; and the development of a professional engagement strategy will both demonstrate their fit to open LIS faculty positions, as well as making continuing scholarly work in the area professionally beneficial. As a bonus, the nine collaborative research projects completed through this program will have direct benefit to the participating libraries, as well as to the larger library community.

2. Project Work Plan

To prepare LIS faculty, nine doctoral students will be selected as LADDER Fellows in the School of Information at the University of Texas at Austin over three years. Each year, the PIs and three doctoral students will collaborate with librarians, rotating across three library contexts: public, school, and academic libraries. Participating libraries will serve as living learning labs in which librarians and cohort members build AI-based tools and develop innovations. Students will be trained as future LIS faculty by publishing their projects in LIS journals/conferences and increasing networking opportunities while working with PIs, peer fellows, librarians, and Advisory Board members.

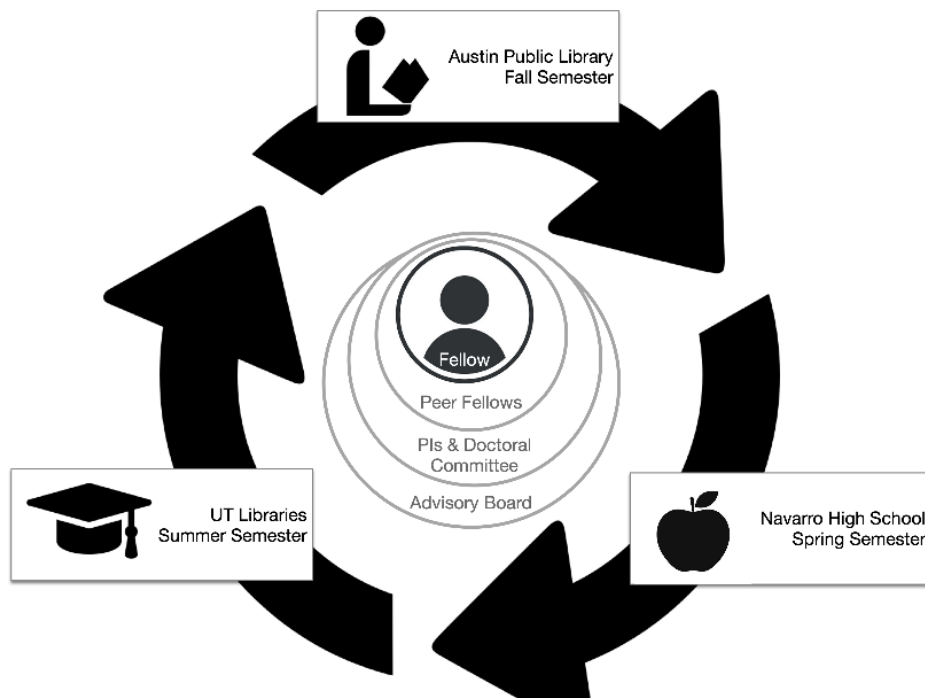


Figure 1: LADDER Library Rotation Model

2.1. LADDER Library Rotation Model

To build a strong bridge between academia and practice, we will develop an innovative Library Rotation Model, adapted from clinical rotations in medical schools. Each year, three doctoral students selected as LADDER Fellows will engage in authentic research projects while collaborating with PIs and librarians across three types of library contexts: public library, school library, and academic library. Austin Public Library, Navarro Early College High School Library,

and University of Texas Libraries will be the partnering libraries and one librarian from each library will serve as the designated librarian mentor for the team of Fellows during each of the rotations. Each library rotation will begin with developing a specific project as a team (Fellows, librarians, and Co-PIs). During rotations, students will work as a team, in collaboration with the librarian and the PIs, resulting in co-authored publications in scholarly and professional journals/conferences. Figure 1 illustrates how the team of Fellows will rotate together from one library to another for four-month rotations and the broader mentoring network guiding Fellows. From Fall 2022 to Summer 2025, three cohorts of doctoral students will be recruited and selected as Fellows. The rotations will be collaborative and iterative; the students will rotate together, and each cohort will execute a project that builds on prior projects.

2.2. LADDER in the Life of the Fellows

LADDER Fellows will be asked to form a doctoral committee in which each committee member takes a specific mentoring role: a research mentor, a professional engagement mentor, and a teaching mentor. The collaborative mentoring is designed to provide a triangulated educational experience for doctoral students so they will grow to be strong researchers and capable educators who understand the importance of applying their knowledge to authentic library contexts. Fellows' coursework in Year 1 will be similar to other doctoral students as they will complete three core courses and research methods courses. They will take Survey of Information Studies, Disciplinary Foundations for Information Studies, The Research Enterprise, Qualitative Research Methods, and Quantitative Research Methods.

In Year 2, selected doctoral students will be ready to participate in the IMLS-funded Library Rotations as Fellows. The scope, topic, and methods of research projects in three different libraries will be determined through brainstorming among students, PIs, and librarians. Fellows are expected to be active members of the team during the process of such discussions. The Library Rotations will provide opportunities for students not only to apply their knowledge in data science and AI to real library contexts and but also to improve their teamwork and leadership skills. Fellows will be strongly recommended to complete coursework including courses such as Human-AI Interaction and Ethics of AI. IMLS funding will provide year-round support for Fellows, including a 12-month, 20-hour/week stipend, tuition, and health insurance.

In Year 3, Fellows will bring together their research projects from Library Rotations and coursework into paper writing with their peers, librarians, and PIs for LIS journals and conferences. They will also participate in monthly meetings in which cohorts from different years meet to share their experiences and provide peer mentoring. LADDER Fellows will be required to take Supervised Teaching in Information Studies, which covers instruction in library and information science courses as well as considerations such as balancing research and teaching commitments. Completing this course will make Fellows eligible to serve as Assistant Instructors, instructor-of-record for undergraduate courses. Fellows will be appointed as TAs for courses such as Community Engagement and Service; Introduction to Information Resources and Services; Managing Information Organizations; and Ethics of AI. In Years 2 and 3, Fellows will present at professional conferences such as ALA, ALISE, and ASIS&T to connect with LIS scholars. Each Fellow will receive \$1,000 for their conference trip.

In Years 4 and 5, Mentors and PIs will use their professional networks to not only ensure successful completion of their doctoral studies, but also to set them up as prime candidates for faculty positions in schools and colleges offering ALA-accredited LIS programs, given their convergent expertise in AI/data science and librarianship. We will also mentor students on how to be successful on the job market. Fellows will be hired as Assistant Instructors in the UT-Austin iSchool. These students will have opportunities to teach undergraduate classes in the Concentrations in Cultural Heritage Informatics and Social Justice Informatics.

TABLE 1: Plan of Doctoral Study for LADDER Fellows

Year in the doctoral program	Emphasis	Funding Source	Education Programs for all UT-Austin iSchool Doctoral Students	LADDER Fellow Activities
Year 1	Coursework	UT-Austin	-Doctoral Committee -Core courses and research methods courses	-Doctoral committee with mentoring roles: Research Mentor (Advisor), Teaching Mentor, and Professional Engagement Mentor
Year 2	Research experience & professional engagement	IMLS	-Work with an advisor -Elective courses	-Library Rotations in three different libraries -Elective courses: Ethical AI and Human-AI Interaction -Attend monthly cross-cohort meetings to report on research progress and reflections -Attend conferences and connect with LIS scholars and professionals
Year 3	Research & teaching experience	UT-Austin	-Co-write papers with an advisor and collaborators -Work as a Research Assistant or Teaching Assistant -Complete Qualifying Procedures	-Co-write papers with peer fellows, librarian mentors, and Co-PIs based on research projects from Library Rotations -Take Supervised Teaching in Information Studies course -Attend monthly cross-cohort meetings to provide peer mentoring for the next cohort -Work as a Teaching Assistant for courses related to librarianship and AI
Year 4	Professional engagement and teaching experience	UT-Austin	-Work as a Research Assistant, Teaching Assistant, or Assistant Instructor -Defend Dissertation Proposal	-Attend monthly LADDER meetings to provide peer mentoring for the next cohort -Work as an Assistant Instructor for a course related to librarianship and AI
Year 5	Dissertation and job seeking	UT-Austin	-Seek positions in academia or industry -Work as a Teaching Assistant/Assistant Instructor or receive a fellowship from UT-Austin -Defend Dissertation	-Seek faculty positions in schools offering ALA-accredited LIS programs

2.3. LADDER in the Life of the Libraries

The research training component of LADDER will take place in the collaborating public, school, and academic libraries. Each project will be led by a librarian, who will receive a stipend of \$1,500 per year for each of the three years of the project for their contributions to the project. Each cohort will bring fresh ideas, perspective, and energy. During each rotation, all three LADDER fellows and the PIs will

collaborate with the librarian to leverage AI and/or data science to further the mission of the library. From the library's perspective, they will be involved in a four-month project, then will have eight months to reflect on the project and its impacts, and then will be able to begin another rotation, which may involve continuing to extend the same project, taking the project in a different direction, or working on a completely different project, at the discretion of the librarian. Librarians will thus have a chance to work on research projects that can benefit their professional development as well as their libraries and their abilities to serve users through their libraries.

For the librarians, engaging in these research projects can be professionally beneficial. For example, the public librarian may gain opportunities to pursue grants to support the library. The school librarian will have an experience which may prompt them to pursue further studies. The academic librarian will particularly benefit from the opportunity to publish in professionally relevant venues. Thus, this project will contribute to the librarians' professional development.

The following are sample project concepts developed by the PIs in consultation with the collaborating librarians. The team will begin by reviewing these ideas and either refine one of these ideas or develop a new idea that is driven by the needs of the library setting to ensure knowledge outcomes for the cohort and relevance and utility for the participating libraries.

[Public Library Sample Research Project] During the public library rotation, the doctoral cohort and research team will work with the Austin Public Library to identify usable data sources (such as circulation and participation in programming) maintained by the library and the top priorities of the library in terms of data use. For example, is the library looking to better target programming, to assist in collection development, or some other priority? Cohort members will then get first-hand experience of applying the principles of privacy held throughout the library domain. This work can include de-identifying library patrons in data sources, ensuring security of the data, and finally, using the data to better understand then needs and aspirations of the community served. Example projects can include using de-identified circulation data in the creation of recommender systems or in balancing collections across library branches to better meet local needs. Projects may also include building data models for assessing the library's impact by combining library data with city data on education, crime, economic development, and voter participation.

[School Library Sample Research Project] One project that we may undertake as part of this research partnership with Navarro Early College High School will focus on enhancing artificial intelligence (AI) and data science literacy among high school students. The doctoral student team will collaborate with Navarro School Librarian Emily Hersh to develop a 12-week education program that can help to enhance students' AI and data science literacy as well as to broaden participation in careers in AI and data science. We will build on Fleischmann's prior collaboration with school librarians in DC public schools to create after-school activities that encourage middle-school students to pursue STEM careers through drawing connections to science fiction, superheroes, and remixing (Ahn et al., 2012; Subramaniam et al., 2012, 2013, 2015; Waugh et al., 2013). We will leverage the doctoral students' technical expertise and the school librarian's expertise in informing and instructing students to develop activities that make careers in AI and data science more exciting and tangible for high school students, with a particular focus on broadening participation among students who are female and/or members of underrepresented minority group. All students will benefit from an enhanced literacy of AI and data science given the degree to which AI and data science will impact a wide range of careers.

[Academic Library Sample Research Project] During the academic library rotation, the project team will collaborate with University of Texas at Austin Libraries to design an academic search system that utilize AI techniques to provide more sophisticated and integrative search environments to the UT institutional repositories, Texas ScholarWorks. This provides online open access to the research

products of the University of Texas at Austin, including dissertations, thesis, preprints, reports, and scholarly articles. The project is aimed at developing, deploying, and assessing an AI-driven search system through a “search as learning” framework (Rieh et al., 2016). Specifically, the project will implement innovative design ideas and evaluate prototypes that transform a current academic search system to help users develop their information literacy competencies so that they become more critical searchers. The motivation of this project is to reconfigure a search system from an information retrieval tool into a search system that plays a central role in supporting a variety of search strategies and learning information literacy skills. PI Rieh’s prior work collaborating with University of Michigan librarians on assessing college students’ information literacy competencies will be integrated into this project (Rieh et al., 2022). We plan to create processes, tools, and learning-centric evaluation measures and methods that for designing and implementing an AI-driven search system while keeping core value of academic library such as fairness, trust, privacy, and transparency.

2.4. LADDER in the Life of the Doctoral Program

The LADDER program will transform doctoral education at the UT-Austin iSchool, and will provide a model that is sustainable, scalable, and transferrable to other LIS doctoral programs. The library rotation model is an innovative approach that can expose students to a wide range of real library contexts and foster collaborations with librarians with different training and service roles. We will sustain the library rotation model beyond the funding period, building upon the relationships established through this project. We will also work to scale this model to become a model for the doctoral program as a whole, emphasizing service learning and hands-on experience in conducting AI and data science research in library settings. As such, this approach can be a model for synergistically combining, rather than viewing as competing and oppositional, the complementary emphasis on technologies such as AI and data science with the longstanding orientation of LIS doctoral programs toward libraries.

UT-Austin offers a strong setting for this pedagogical innovation given the confluence of strengths on both the technology and library sides, within and beyond UT-Austin. On the technology side, UT-Austin is the lead institution for one of the first five AI Institutes funded by the National Science Foundation, the Institute for the Foundations of Machine Learning (IFML). Co-PI Fleischmann serves as a senior person and ethics lead for IFML. UT-Austin has three campus-wide research grand challenges, and one of these, Good Systems, a UT Grand Challenge, focuses on developing ethical AI-based systems; Co-PI Fleischmann is the Founding Chair of Good Systems. Austin is also a hub for innovation in AI and data science, including hosting the annual South by Southwest Interactive, an active startup scene, and significant presences of most of the main players in this space. On the library side, Austin recently invested \$125 million in the new Central Library for Austin Public Library. The UT-Austin iSchool recently established the Virginia and Charles Bowden Professorship, bringing Co-PI Lankes to the iSchool. PI Rieh and Co-PI Lankes are working to establish a certificate program through the Bowden Professorship. Thus, UT is the ideal home for LADDER.

LADDER will serve as a model for a new approach to developing LIS faculty that connects the technology and library foci found at most iSchools. We will work to transfer the LADDER model to other institutions, starting with our advisory board members, as well as the LADDER fellows themselves, who will be our best ambassadors as they are hired into peer iSchools and will begin advising their own doctoral students. We will also leverage the iSchool Inclusion Institute to help transfer this model, through its network of faculty and doctoral student instructors and alumni. The LADDER model will start in Texas and change the world as the university slogan states.

2.5. Project Personnel

Project Team: Soo Young Rieh, Ph.D. (Professor and Associate Dean for Education in School of Information at University of Texas at Austin) conducts research on search as learning and design learning-centric search systems that support critical thinking and creativity. She will bring her previous experience of co-leading two IMLS-funded projects as a Co-PI. She completed IMLS-funded Library as Research Lab Project (RE-95-17-0104-17) from 2017 to 2022 collaborating with librarians at the University of Michigan Libraries (Rieh, Yakel, and Alexander, 2020). She is currently organizing the 2022 IDEA (Innovation, Disruption, Equity, Access) Institute on Artificial Intelligence Institute (RE 246219-OLS-20) at the University of Texas at Austin in July 2022. **Kenneth R. Fleischmann**, Ph.D. (Professor in the School of Information at the University of Texas at Austin) is the Founding Chair of Good Systems, a UT Grand Challenge, one of three eight-year campus-wide research grand challenges at UT-Austin, focusing on the ethics of AI. He is also the Founding Director of Undergraduate Studies for the UT-Austin iSchool's new undergraduate major in Informatics, and the Founding Editor-in-Chief of the ACM Journal on Responsible Computing. He is also collaborating on an NSF Research Traineeship Grant that is leading to the creation of a Graduate Portfolio Program in Ethical AI, which will be open to graduate students across UT, including potentially the LADDER Fellows, who may benefit from taking offered courses such as Ethics of AI and Human-AI Interaction. **R. David Lankes**, Ph.D. (Virginia and Charles Bowden Professor of Librarianship in School of Information at University of Texas at Austin) brings broad expertise in librarianship and a strong network of public, school, and academic librarians globally. His participatory research approach will help guide the development of rotation projects as well as using his extensive mentoring experience to advise Fellows on issues of professional engagement. This work has been formed through sponsored research from the U.S. Department of Education, IMLS, the MacArthur Foundation, and the National Science Foundation.

The Advisory Board includes four experts representing professional engagement with academic libraries, public libraries, school libraries, and data science. The primary role of the Board will provide mentoring to help Fellows connect with practitioners and faculty members outside the UT-Austin. The Board members will participate in two remote Board meetings per year. **Megan Oakleaf**, Ph.D. is Associate Professor in School of Information Studies at Syracuse University. Oakleaf's vision of academic libraries as venues for teaching and learning in their communities aligns with the overall purpose of this project in terms of using libraries as living learning labs to identify and expand library value and impact. **Douglas Oard**, Ph.D. is Professor at the University of Maryland, with joint appointments in the College of Information Studies and the University of Maryland Institute for Advanced Computer Studies (UMIACS). He will provide expertise in information retrieval, AI, and data science. **Mega Subramaniam**, Ph.D. is Professor and Associate Dean for Faculty in College of Information Studies at University of Maryland. Her work focusing on enhancing the role of school libraries and public libraries in fostering STEM learning among underserved young people will offer contribute to research projects through library rotation model. **Luke Swarthout** is Director of Digital Policy at New York Public Library. His expertise in digital equity, patron privacy and digital strategy will be valuable in integrating digital technology into public libraries.

The Partner Libraries include three libraries in Austin, Texas. **Austin Public Library** serves about 1 million population in the area of Austin and maintains 1.5 million items with its 23 branches. It used to have more than 3 million visitors per year before the pandemic began in 2020. The University of Texas Libraries maintains more than 10 million volumes and providing access to the latest digital journals, databases and web resources. The **Navarro Early College High School Library**, located in Austin Independent School District, serves 1,566 students. As of October, 2020, 87.9% of students are Hispanic and 6.3% are African American. The student demographics show that 82.6% of students are

economically disadvantaged. The **UT Libraries** recognize collaboration, customer focus, expertise, and innovation as core values. Letters from partner libraries are appended to the proposal.

2.6. Dissemination

LADDER seeks to have broad impact in LIS education beyond the cohort. Outputs of the project will include sharing research results via papers and conference presentations. Learning and project materials will be disseminated through a number of channels. The primary means of dissemination for documents related directly to LADDER and the preparation of Fellows will be on a standing project website hosted by the University of Texas at Austin. Results and research materials generated by and for the public, academic, and school rotation projects will be published in traditional scholarly venues (journals and conferences) and pre-prints will be made available via the university's scholarly repository. Finally outreach and results of LADDER will be done through a series of webinars with relevant professional associations. The following table includes specifics on the materials anticipated.

TABLE 2: Summary of Dissemination Plan

Type of Information	LADDER Related Files	Rotation Project Outcomes	Outreach to Other Doctoral Programs
Forum for Dissemination	A standing project website shall act as repository and locus on program documentation	Traditional practitioner and academic outlets such as journals and conferences, Texas ScholarWorks	Webinars with allied professional associations on the recruitment and preparation of AI and data science future faculty
Shared	Publications and presentations resulting from the work of the cohort	Publications and presentations on the overall project in preparing future faculty	The American Library Association (ALA)
	Materials related to the overall project of preparing AI and data science future faculty. This includes: policy statements on recruitment and annual evaluations; curriculum and lesson plans for working with cohort students; assessment rubrics for cohort courses and activities; timelines for cohort recruitment and orientation.	Materials and outcomes related to specific projects of the cohort in K-12, public, and academic settings. This includes: studies on the effectiveness of the program. Research materials and outline of cohort projects. Summary of cohort projects.	The Association for Information Science and Technology (ASIS&T)
	Monthly Cross-Cohort reports		The Association for Library and Information Science Education (ALISE)

Project activities, results, and any accompanying materials (curriculum, guides, policies, articles, presentations) will be made available on a project website under the Creative Commons licensing.

3. Diversity Plan

To ensure that the LADDER program will contribute to diversity, equity, and inclusion, the PIs have consulted with the Assistant Dean for Diversity, Equity, and Inclusion, the Director of Doctoral Studies, and the Assistant Dean for Education and Student Affairs (see their supporting letters included). Our diversity plan has three elements: recruitment, environment, and research.

First, we will work to broaden participation by ensuring that students bring diverse perspectives and experiences in terms of dis/ability, gender, gender identity and expression, race/ethnicity, religion, sexual orientation, socioeconomic status, and veteran status into this program. We will work with the University of Texas at Austin Office for Inclusion and Equity and utilize their active recruiting strategies based on *Inclusive Search and Recruitment Toolkit for Faculty, Graduate Students, and Postdoctoral Fellows*. For example, when developing the “call for applications” announcement, we will articulate the UT-Austin iSchool’s commitment to diversity and use inclusive descriptions to ensure a broad candidate pool. We will make recruiting trips to regional minority serving institutions to recruit potential applicants. Specifically, we plan to visit Huston-Tillotson University, Prairie View A&M, and Texas Southern University (Historically Black Colleges and Universities) as well as UT-Austin, Texas State University, and Texas Woman’s University (Hispanic-Serving Institutions).

Second, once the Fellows are selected, we will create a collective, collaborative, and supportive learning environment so that no Fellow, participating librarian, or advisory board member will fall behind or be excluded. Throughout a variety of program evaluation activities such as interviews, post-project debriefing sessions, doctoral student review processes, we will identify opportunities and challenges so we can make continued efforts of providing an inclusive learning environment for doctoral students to succeed in the program and beyond.

Third, projects in the Library Rotations will address diversity, equity, and inclusion issues in the application of data science and AI in three participating libraries. For instance, the projects will examine algorithmic biases, inequities, accessibility, ethics, and fairness of AI and data analytics. Fellows will be trained in research ethics, including human subjects protections. Fellows will also be trained in diversity, equity, and inclusion in research and in the classroom.

4. Project Results

AI and data sciences are having an increased impact on communities nationwide. Librarians' proficiency with these skills and concepts is crucial to help drive that conversation in ways that will benefit society. This program will improve librarian readiness by training the trainers, and thus ensure impact with the IMLS funding that lasts for decades. The Library Rotation model developed in this program will be scalable and transferable to LIS doctoral programs nationwide, providing a new model for LIS doctoral education.

The primary project result for this project will be the AI and data science-skilled new LIS faculty trained through this grant. There is a need for LIS faculty who have expertise in AI and data science. While hiring PhDs in computer science and other technical fields is one way to address this need, unfortunately not all of these hires work out, and often there is a gap in terms of the faculty member’s understanding of the library context. As a result, they may not be able to provide as relevant or high-quality education to future librarians. Further, they may also fail to take opportunities to leverage the library setting as a setting and object of study in their research, which is a missed opportunity.

Thus, in contrast, our project will reach these future faculty at a critical time, after they have already received some training in AI and/or data science, but while they are still completing their studies

and more open to learning new things. They will undertake research rotations in the public, school, and academic library settings that will help them to appreciate the role of libraries in our everyday lives as well as the current and future roles that AI and data science can play in libraries. These rotations will help them to select a dissertation topic in which they will conduct AI and/or data science research in partnership with a library or otherwise in connection to a library setting or use case. Thus, LIS programs will be able to populate their faculties with PhD graduates of LIS programs who have both expertise in AI and/or data science and a deep understanding and appreciation of the library setting.

One of the research questions that we ask and seek to answer in this project is, how can we ensure that libraries play a leading role in advancing AI and data science? We hope that the project will provide an avenue for libraries to play such a role, through training future faculty with expertise that spans AI/data science and libraries.

Another research question that we ask and seek to answer is, how can we staff LIS faculty with AI and data science researchers/educators who situate their research and education in the library setting? We hope that the rotation model employed and evaluated in this project will provide such a path. If successful, we hope that this model will be adopted by others, and we will work to share the results of our project as well as all materials used in the project are shared so that they can benefit other LIS doctoral programs.

We also ask the research question: how can we design and implement a training program for LIS doctoral students that brings in students with AI and data science skills and trains them in leveraging this expertise in the library setting? We hope this model will provide such a pathway. Given the strengths of our team and program both in libraries and in AI and data science, we can provide the ideal setting for developing, deploying, and evaluating this approach.

In terms of benefitting society, the largest impact will be the future librarians trained by the faculty members trained in this project. A train-the-trainers project works particularly well for scaling up societal benefit and impact, making a lasting difference. These LIS faculty will likely also seek out prospective doctoral students with backgrounds in AI and/or data science, and may employ a similar rotation model in their future advising in other LIS doctoral programs nationwide. Thus, future librarians and future faculty trained by the faculty trained from this project will benefit, and each will benefit society and the future students who they in turn train.

We also hope that there will be immediate impacts and benefits to the partnering libraries through developing new technologies and services that can help them to better carry out their missions. The research projects should be mutually beneficial, providing valuable learning experiences for the doctoral students while also starting what can be a career-long dedication of the students to improving the technologies and services used in libraries, which they will understand can only be done by collaborating closely with trained and skilled librarians.

The UT-Austin iSchool has an outstanding doctoral program, including many students with expertise in libraries, data science, and/or AI. This program will deepen the synergy between the library side and the AI/data science side. It will create a new model that faculty and students involved in the program will sustain across our careers. We will also scale this model to other faculty within the UT-Austin iSchool, providing this as a School-wide model.

We will also work to transfer this model to other iSchools. Doctoral students trained in this program will be our best ambassadors, and will carry this experience with them throughout their careers. We will also share our approach and model at ALA, ALISE, and ASIS&T conferences and events. Through these efforts, we will work to transfer this model nationwide.

DIGITAL PRODUCTS PLAN

1. TYPE

Digital content will include project summaries, meeting notes, papers, presentation slides, and posters created by key project personnel and Fellows. These will include downloadable Word, PDF, videos, images, PowerPoint documents. The born-digital products also include source code, algorithms, applications, digital tools, and accompany documentation.

2. AVAILABILITY

We will create the project website to make our work products to be widely available to the public. In the project website, we will share information about the IMLS grant updates, presentation materials, publications, and videos among others.

3. ACCESS

All work products resulting from our project will be accessible to library and information professionals and LIS educators for free. We will assign the Creative Commons “Attribute-Non Commercial CC BY-NC” license. This license lets other remix, tweak, and build upon our work non-commercially. Any new works must acknowledge the LADDER project and funding by IMLS.

4. SUSTAINABILITY

We will also upload pre-prints of publications and presentation materials to Texas ScholarWorks (TSW) (<https://repositories.lib.utexas.edu/>) which provides open access to the products of the University of Texas's research and scholarship.

The data sets, source codes, and applications produced from the project will be deposited to the Texas Data Repository (TDR) (<https://dataverse.tdl.org/dataverse/utexas>) which is an installation of opensource application called the Dataverse software, originally developed by Harvard University. TDR is built for publishing and archiving datasets (and other data products) created by faculty, staff, and students at Texas higher education institutions. We can link our data in TDR and associated publications in TSW.

ORGANIZATIONAL PROFILE

The School of Information at the University of Texas at Austin, founded in 1948, is one of the top five graduate schools in the field in the United States and Canada. The School offers an American Library Association (ALA) accredited masters of science in information studies as well as a doctoral degree program. Master's degree students specialize in content areas ranging from information architecture to librarianship to preservation administration.

The School of Information aims to be the premier research and education program for 21st century information professionals who will apply the theoretical and practical knowledge necessary to preserve the past, manage the present, and design the future. The mission of the school is to shape the field of information studies for human and social benefit by discovering new and vital knowledge about information, educating the next generation of leaders in the information professions, developing new scholars who will advance knowledge, improving society through service and collaboration, and applying human-centered values to all its work.

The 5,000 master's and more than 70 doctoral alumni of the School of Information work in nonprofit and for-profit environments around the world, including positions as librarians, information resource managers, educators, researchers, consultants, and entrepreneurs. Current enrollments include approximately 300 students.

The school is an autonomous graduate, professional school. It has the authority, with the final approval of the president of the university, to hire its own faculty and to administer its own budget. The dean of the school reports to the executive vice president and provost.

The School of Information is in the UT Administration Building located at 1616 Guadalupe Street, two blocks south of the main University of Texas at Austin campus. It occupies approximately 40,000 square feet of classroom, research, and administrative space. The facility has a large conference room, classrooms, small seminar rooms, labs (computer, usability testing, and a paper and book conservation labs), faculty and administrative offices, doctoral student offices, research space, and a student lounge and kitchen. The information technology lab currently has 19 Dell OptiPlex GX 360s, 6 iMacs, and 13 Mac Minis. The lab also hosts a digitization lab with 6 Precision 690 workstations for high end digitization and two sound rooms, each with a Precision 3400 and a PowerMac G5 workstation. The lab offers color and black-and-white printers, plotter poster printing, color scanners, slide scanner, several projectors, digital video cameras, and field recording equipment. There are an additional 21 Dell Precision T1600s and 21 Mac Minis in the adjacent computer classroom. All computers can access the University of Texas at Austin high-speed network through both wireless and Ethernet connectivity.

The school has 22 full-time faculty who reflect a broad range of teaching and research interests. The school also employs some twenty adjunct professors and has sixteen support staff.