

## Open Educational Resources on Algorithmic Literacy

Hosted by Cornell University Library

**Project Justification:** We request an 18-month grant to plan for creating and distributing Open Educational Resources (OER) on algorithmic literacy, primarily for library instruction but with broader applications.

According to a recent report from Project Information Literacy, instruction about algorithmic systems is largely insufficient, and library patrons, especially students, are left needing more substantive and accessible resources.<sup>1</sup> A search on “algorithms” in the popular repositories OER Commons and MERLOT yields a handful of lesson plans and modules from sources like WikiBooks and Khan Academy. However, most focus on the computational processes and mathematical concepts needed to design and build algorithms. Few provide the critical and conceptual skills needed to understand algorithmic systems and their social impact on decision-making and information access.

We aim to provide OER that will address this gap. We will develop a strategic plan to facilitate the creation of materials that are modular, dynamic, and adaptive, while prioritizing accessibility, sustainability, and the needs of our communities. Many libraries offer workshops on digital tools, social media, and privacy practices, and thus library staff accustomed to teaching these components of information literacy are well-positioned to assess curricular gaps related to algorithmic literacy.

This planning project will first conduct participatory user research about current understandings of algorithms and educational needs related to algorithmic systems. It will then assess best practices for an algorithmic literacy package containing off-the-shelf curricula, online learning objects, and assessment tools. By increasing awareness of the role algorithms play in information access and production, this project aligns with the goals and objectives of the Laura Bush 21st Century Librarian Grant Program to serve the information needs of our communities (Objective 3.2), promote digital literacy (Objective 3.3), and to provide opportunities for learning (Objective 3.5).<sup>2</sup>

**Statement of Need:** Algorithms and algorithmic systems increasingly play a critical role in our material and digital lives. They determine what information is prioritized, discovered, and utilized by both individuals and artificial intelligence in decision-making. Despite their direct impacts on the lived experiences of library patrons and the public sphere, algorithms tend to exist in “black boxes”, which conceal them from scrutiny and contribute to a lack of public understanding of their processes. However, a growing number of scholars, nonprofits and advocacy groups are helping to expose the implications of algorithmic decision-making. Building upon the work of these important organizations, we aim to identify the educational gaps around algorithms and to empower library workers teaching algorithmic literacy.

**Broad Impact:** While recent research in Library and Information Science (LIS) has addressed the ways algorithms and algorithmic systems are generally shaping information access, this project emphasizes the specific role of library workers in serving their communities with a focus on concrete practices. Planning this project will allow us to explore the complexities of creating OER with Creative Commons licenses so that they can be adapted for broader audiences, including K–12 schools and community centers. To reach these audiences, curricular and training materials will address the following big-picture questions: *What is an algorithm? What distinguishes one type of algorithmic system from another? What are strategies for navigating algorithmic systems? How do algorithms shape information access, and what agency can libraries exert in increasing algorithmic literacy?*

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<sup>1</sup> Head, Alison J., Barbara Fister, and Margy MacMillan. “Information Literacy in the Age of Algorithms,” January 15, 2020.

[https://projectinfo.org/pubs/algorithm-study/pil\\_algorithm-study\\_2020-01-15.pdf](https://projectinfo.org/pubs/algorithm-study/pil_algorithm-study_2020-01-15.pdf).

<sup>2</sup> “Laura Bush 21st Century Library Program FY 2023 Notice of Funding Opportunity.” Institute of Museum and Library Services, July 2022.

<https://www.imls.gov/sites/default/files/2022-07/fy23-ols-lb21-nofo.pdf>.

**Project Work Plan:** Elaine Westbrooks (Cornell University) will serve as the primary Principal Investigator, and Iliana Burgos and Reanna Esmail will serve as Co-Primary Investigators (Cornell University). Additional team members will contribute to the full work plan according to their respective areas of expertise: OER: Scarlet Galvan (Grand Valley State University), Ashley Shea (Cornell University); community outreach: Andrea Puglisi (Westfield State University), Frank Skornia (The Ferguson Library). Alison Macrina (Library Freedom Project) will serve on an advisory board, along with other leaders with expertise in algorithms, OER, and community outreach. The project team will meet every biweekly with alternating meetings for the steering team at Cornell and the team-at-large. Personnel assignments and allotted work percentages will be determined in coordination with each team member.

The project team will execute the eighteen-month project in two main stages:

### 1. Assessing current needs

- August–September 2023: Review LIS scholarship and perform environmental scan on key community-based organizations working in algorithmic literacy; write literature review
- October 2023: Recruit survey (LIS professionals) and focus group participants (library patrons)
- November–December 2023: Conduct focus groups; begin assessing survey feedback
- January–February 2024: Analyze focus group data
- March–May 2024: Synthesize findings into a written report and share out to stakeholders; identify formats and repositories for OER prioritizing accessibility and discoverability

### 2. Developing OER prototypes for review and feedback

- June–August 2024: Develop three lesson module prototypes for LIS practitioners, including single-use lessons, active learning exercises, assessments, and videos
- September 2024: Share lesson module prototypes with stakeholders for feedback
- October–November 2024: Present preliminary findings and progress at professional conferences; incorporate feedback from conferences and public presentations into OER planning
- December 2024–January 2025: Evaluate project; create work plans for OER dissemination

**Diversity Plan:** Algorithms encode social biases, as is well known from congressional hearings, lived experiences, and academic research. Scholarship inspiring this project comes from women of color researchers, such as Ruha Benjamin, Simone Browne, Joy Buolamwini, Safiya Noble, and Zeynep Tufekci, who have examined how algorithms affect marginalized communities. The project’s outreach and assessment components are likewise rooted in community engagement, and employ community-driven decision-making. Critical pedagogy and universal design principles will guide the OER development. Equitable access is a necessary component and goal of the OER movement. We aim to ensure equity by strategizing ways to overcome infrastructural issues related to OER access.<sup>3</sup>

**Project Results:** This project has two key deliverables: 1) an assessment report detailing current needs for algorithmic literacy resources and outlining key strategies for algorithmic literacy OER dissemination; 2) three instruction module prototypes for “algorithmic literacy packages” containing off-the-shelf curricula, online learning objects, and assessment tools. The project will also consider best practices for offering adoption grants and translation services to make materials easily accessible for community-specific needs.

**Budget:** The total budget of \$149,525.68 will support Salary, Wages, and Fringe (\$47,443.73); Supplies, Materials, and Equipment: (\$5,250); Subawards and Contracts, including honoraria and collaborator salaries (\$36,449.10); Travel (\$15,000); Other Costs (\$5,000); and Indirect Costs (\$40,382.85).

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<sup>3</sup> Hathcock, April, and Susan Davis. “Racing to the Crossroads of Scholarly Communication: But Who Are We Leaving Behind?” *The Serials Librarian* 74, no. 1–4 (May 31, 2018): 49–53. <https://doi.org/10.1080/0361526X.2018.1447751>.