NEH Application Cover Sheet (HAA-269068)
Digital Humanities Advancement Grants

PROJECT DIRECTOR

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INSTITUTION

University of Maryland
College Park, MD 20742-5141

APPLICATION INFORMATION

Title: *Advancing Community Digital Collections through Minimal Computing: The Lakeland Digital Archive*

Grant period: From 2020-02-01 to 2021-06-30
Project field(s):   Interdisciplinary Studies, Other

Description of project: Residents of Lakeland, a 130-year-old African American community adjacent to the University of Maryland (UMD) have worked for more than 10 years to document, preserve, and share their cultural heritage. Their ambition has been to capture a history that covers African American life in the long 20th century in their own voices as community members. This project will develop a working prototype of the Lakeland Digital Archive to demonstrate how digital humanities methods such as minimal computing can enhance community-led projects by empowering them to build digital publications that are resilient, shareable online and off, and amenable to models of shared governance. Continuing an existing community-university partnership, the Maryland Institute for Technology in the Humanities (MITH) will collaborate on this Level II grant with the Lakeland Community Heritage Project (LCHP) and other local partners. This project has the potential to enhance the humanities by contributing to

BUDGET

Outright Request	99,993.00	**Cost Sharing**	0.00
Matching Request	0.00	**Total Budget**	99,993.00
Total NEH	99,993.00		

GRANT ADMINISTRATOR

Ms. Marietta Jimmerson
Office of Research Administration
College Park, MD 20742-5141
USA

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ADVANCING COMMUNITY DIGITAL COLLECTIONS THROUGH MINIMAL COMPUTING: THE LAKELAND DIGITAL ARCHIVE

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Participants List

Trevor Muñoz, Project Director
Interim Director, Maryland Institute for Technology in the Humanities
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* Members of the existing UMD-LCHP research team contributing to the Lakeland Digital Archive project; not funded by this grant.

Narrative

Enhancing the Humanities. Residents of Lakeland, a 130-year-old African American community adjacent to the University of Maryland (UMD) campus in Prince George's County just outside Washington, DC, have worked for more than 10 years to document, preserve, and share their cultural heritage. Their ambition has been to capture a history that covers African American life in the long 20th century, including segregation, suburbanization, education, and urban renewal as well as civic associations, politics, activism, and other forms of cultural heritage — and to do so in their own voices as community members. Their ongoing, collectively authored public work forms a significant contribution to the humanities for its rich content and for the way it models how practices and products of the humanities can be employed to serve goals, like sustaining community, public works planning, and strengthening family networks—goals far beyond research alone.

Yet a substantial portion of Lakeland's public humanities work has so far circulated only within the community, the city of College Park, and some precincts of the University of Maryland. This project will develop a working prototype of the *Lakeland Digital Archive* to demonstrate how digital humanities methods such as minimal computing can enhance community-led projects by empowering them to build digital publications that are resilient, shareable online and off, and amenable to models of shared governance over materials. Continuing an existing community-university partnership, the Maryland Institute for Technology in the Humanities (MITH) will collaborate on this Level II grant with the Lakeland Community Heritage Project (LCHP) as well as with the Department of American Studies and the University Libraries. Beyond researchers concerned with African American history and culture and with Lakeland specifically, this project has the potential to enhance research, teaching, and learning in the humanities more broadly. It is designed to contribute new methods and findings to critical discourses on how the inclusion of materials like oral histories challenges and enriches historical and cultural narratives, and how building, describing, and maintaining collections and archives generates new knowledge.

Part of the promise of the early Internet was that anyone could publish to it using simple tools: first, a plain text notepad program, file transfer software, and a simple Web server, and later more full-service content management systems such as Wordpress or Drupal. As the Internet has become more central to the practice of humanities research and cultural heritage, the tools to publish websites on one's own have become increasingly complex. This is especially true for websites meant to serve as digital collections or archives. While many libraries, archives, and museums now recognize the value of having their collections accessible online — and while many humanities scholars build personal or thematic digital research collections as part of their scholarship — the tools and infrastructure to achieve this can strain the capabilities and resources of even privileged institutions. They require elements like computer servers, and software maintenance and navigation of the complex procedures of online publication. Alternately, they rely on vendors that provide these platforms as a service with a concomitant surrender of the user's full creative and administrative control. Control of the process of collection building and publication can feel elusive to small organizations and community groups like LCHP. This dynamic has more than technological consequences—it undercuts the work of recovering under-documented histories and empowering communities who might formerly have been objects of research with the agency to tell their own stories and control their cultural resources.

"Minimal computing" is an intentional move away from the complexity of certain digital publishing and information management tools. Within the digital humanities over the past 5 years, there has been increased interest in evolving alternate modes of web publishing in order to further a particular set of strategic goals related to access, sustainability, and data ownership. The resulting set of methods has become known as [minimal computing](). One of the primary goals of minimal

computing is to reduce the dependence on costly web and Internet service infrastructures which raise the bar for participation, while often creating centralized, single points of failure that can imperil the long term sustainability of published materials. These techniques have been promoted by groups such as Global Outlook::Digital Humanities (GO::DH), a special interest group of the Alliance of Digital Humanities Organizations (ADHO). GO::DH employs minimal computing as a means to make the field more inclusive of scholarship from the Global South, where scholars often experience limited network bandwidth, electricity, and equipment. In other cases, scholars who are technically skilled and sensitive to privacy and control issues promote these techniques to avoid the potential for monopoly power on commercial web platforms (such as the Medium publishing platform) or the network of surveillance and data brokering that is a feature of the modern web. Despite the growing interest, the full implications of minimal computing for community-developed and controlled digital collections remain unexplored.

The *Lakeland Digital Archive* is an excellent site for the type of research this project proposes because of the Lakeland community's engagement in stewarding and sharing its cultural heritage and because of the ways that the community-university partnership has centered the importance of empowering Lakelanders to control this heritage and tell their own stories. While LCHP operates a Wordpress-powered blog for maintaining community ties and UMD American Studies students have contributed to an Omeka digital collection, LCHP, like many community organizations, does not develop and maintain technology as its core activity. In Lakeland there is an active group to contribute to the design and use of a prototype digital collection and a core requirement for any technological solution must prioritize community ownership and autonomy. This situation is shared by many other small community-led cultural heritage groups who will form an audience for this project beyond Lakeland. The community-university partnership behind this project has been accepted to present a workshop on minimal computing approaches at the upcoming [Black Communities Conference](#) in Fall 2019. Furthermore, as LCHP Director Maxine Gross writes in her letter of commitment and support, the audience for this project is not bounded by one community due to the nature of Lakeland itself, as the hub of an interconnected network of small communities in Maryland that are important sites for African American history and culture.

The collaboration between LCHP, American Studies, the Libraries, and MITH will examine facets of digital collection building and maintenance that have been explored with "standard" online platforms (such as Omeka or Mukurtu) and software but have not been investigated in minimal computing frameworks. Using three principal approaches — tools such as static site generators; alternative Internet protocols that depend on peer-to-peer networking; and very low-cost computing devices, such as Raspberry Pi — this project will explore workflows for transforming community data into usable digital collections websites, ways of architecting digital collections that are available offline and can be easily shared through in-person connections (via thumb drive or similar means) as well as broadly online, and modes of delivering collections that can be shared or purposefully divergent to match governance and ownership by many stakeholders.

An essential part of this workflow will involve the use of Airtable as the data backend for the static site generator. Airtable is a general-purpose online relational database application that looks and functions like a spreadsheet, but includes more robust relational functions allowing users to meaningfully connect data between different tables/worksheets, support custom linked vocabularies, and repeating/multiple values. Operating somewhere between Excel/Google Spreadsheets, FileMaker, and OpenRefine, Airtable has a high ease of usability and a very low barrier of entry for use. This makes it an ideal solution for small cultural heritage organizations and regional community archives operating with a disbursed labor force, without the resources or skill sets to implement (or purchase) more technologically complex solutions for metadata management. Airtable also has a simple REST API which MITH has tested as part of workflows in other projects.

Modeling these findings in a prototype developed by a joint community-institutional team, this project will contribute to the humanities new ways that the tools and methods of minimal computing can further — rather than compete with — the goals of critical community-led digital public humanities.

Environmental Scan. As described above, minimal computing encompasses multiple methods and communities of practice and extends beyond the digital humanities. One example of this work has been the development of "sneakernets" and portable storage devices to disseminate "static" web content along trusted channels where electricity and Internet access is often unavailable. This web content is called "static" because of its representation as simple files on disk (HTML, CSS, JavaScript, images, video) that do not require content management software (CMS) to access, and can simply be viewed as-is in a web browser. This allows the content to be easily copied from computer to computer using physical media, or local networks, without requiring participants to obtain, install and maintain additional software, which in itself can present significant barriers to entry.

The origins of static websites go back to the beginnings of the web when individuals hand-crafted HTML files, and served them up from directories using the first web server software. However, with the introduction of the Common Gateway Interface (CGI) protocol in 1993 by NCSA the web quickly developed the ability for HTML to be generated "on-the-fly" by server-side programs, which paved the way to the rich and diverse landscape of content management systems we see today on the web.

And yet, static websites never really went away. Perl's Template Toolkit and Ruby's Jekyll popularized the use of "static site generators", which are pieces of software for generating static content that can then be copied to and served up by web servers. This technique has been actively used by media outlets such as the BBC and the New York Times for serving web pages in high volume environments where it was computationally (and financially) expensive to render web pages on the fly from databases. Today in addition to traditional server-side CMS software there is also a rich ecosystem of at 250 open source static site generators.

Tools such as Columbia University's Wax and University of Idaho's Collection Builder have used the Jekyll static site generator to provide a generalized framework for building digital exhibitions and collections. Similarly, The Getty Research Institute's Quire uses the Hugo static site generator to create a multi-format publishing framework for ebooks. These examples highlight how the digital humanities is using static site generation as a means for creating easily deployable, portable and low-maintenance web applications. However there are significant research and prototyping work that remain for applying minimal computing technologies to community collections.

One area of further development involves the ability to construct static web *applications* that can dynamically respond to user input, rather than static web "sites" that can be navigated by following links. The beginnings of this type of interactivity can be found in Wax's use of JavaScript to provide full-text search, and in Quire's use of JavaScript to allow images to be manipulated (pan and zoom) through an International Image Interoperability (IIIF) JavaScript viewer. This project will pursue the potential to integrate a greater level of interactivity into minimal computing applications without requiring greater dependence on expensive Internet infrastructure.

Furthermore, digital humanities static site publishing has, understandably, focused largely on the needs of open access publishing on the web. This has aligned well with the needs of public scholarship, where publishing a website for the world to see and use is an important and desirable outcome. However, when community archives are constructed it is often necessary to mediate access

based on collective roles and values within the community itself.[1] Putting content on the open web for indexing by search engines, and the inevitable unwanted appropriation and recontextualization that can occur can dissuade community archives from creating websites in the first place. Static sites by definition lack server side software that would allow users to authenticate, and view content based on their credentials. However as minimal computing scholarship has made clear, there are other ways for content to move outside of the traditional client/server web. Content can instead be transferred via multiple pathways, from community member to community member, as either physical media (USB flash drives, Raspberry Pi) or on local networks that are disconnected from the larger Internet. Developing models and practices for how these transfer hand-offs can occur within the Lakeland community and similarly communities is important work for this project

Finally there is the problem of updating, synchronizing and maintaining static site content once it has been disseminated. As their name implies, static sites are comprised of fixed files which, unlike database driven websites, are not updated and otherwise changed. Once a website has been transferred (copied) from one person to another it is difficult if not impossible for the publisher to indicate a new version of the content is available, and for the receiver to update their content. Emerging distributed web protocols such as Dat[2] and Secure Scuttlebutt (SSB)[3] make it feasible for publishers to notify those interested in updates, and for interested parties to synchronize their content. These technologies allow instances of the content to exist independently of each other, in heterogeneous environments, and to be shared in a peer-to-peer settings using commonly available personal computing environments. Exploring how well these technologies work in the community archive setting, where the ability to control how content is shared and with whom, as well as remove content when necessary is also important research work that needs to be done.

The Lakeland project brings these three growth areas for minimal computing (interaction, contextual sharing, and maintenance) together in the context of a community archiving minimal computing project. In addition to leveraging new protocols for sharing outside of the traditional Internet, our project will be informed by lessons learned from the early days of electronic publishing with laserdiscs and CD-ROMs and file-transfers[4] Exploring how these media driven transfers can operate within postcolonial frames[5] is an intervention that the Lakeland Project is well positioned to undertake.

History of the Project. The Lakeland Digital Archive began in 2009 when LCHP began collaborating with Mary Corbin Sies of UMD's American Studies department with a series of community-directed class projects documenting, collecting, and creating a digital repository of Lakeland's heritage. A unique feature of this community-university collaboration is that it maintains Lakelanders' control over their archive in keeping with LCHP's mission "to collect, preserve, and interpret the heritage and history of those African Americans who created, lived in, and/or had association with the Lakeland community of Prince George's County, Maryland" *in their own voices*. Consequently, the collaboration models — for Lakelanders and for students — a community-centered and equitable approach to preservation that empowers and motivates community members to

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[1] Christen, K. (2015). Tribal archives, traditional knowledge, and local contexts: Why the s matters. Journal of Western Archives, 6(1).

[2] Ogden, M., McKelvey, K., and Madsen, M. B. (2017)

[3] Enes, V., Almeida, P. S., Baquero, C., and Leitão, J. (2019). Efficient synchronization of state-based credits. In 2019 IEEE 35th International Conference on Data Engineering (ICDE), pages 148−159.

[4] Madden, E. (2007). Digital curation at the Library of Congress: lessons learned from American Memory and the Archive Ingest and Handling Test. Technical report, Library of Congress.
Shirky, C. (2005). AIHT: Conceptual issues from practical tests. D-Lib Magazine, 11(12).

[5] Phillip, K., Irani, L., and Dourish, P. (2012). Postcolonial computing: A tactical survey. Science, Technology & Human Values, 37(1).

actively and critically curate their heritage. MITH joined the partnership in 2017 and carefully maintains that community-directed model by regularly consulting with LCHP and presenting plans and ideas to the community to receive direction and feedback.

The Lakeland Archive contains oral histories, moving images, newspaper clippings, deeds, maps, photographs, and other materials that Lakelanders and UMD students have contributed as they have completed their research. Before MITH was involved with the project, subsets of these collections were made available via an early Omeka website, but the site was frequently unavailable due to a lack of ability to maintain the CMS technology. MITH's Ed Summers worked to restore the availability of the site, and to create copies of the metadata and files hosted on it.

Over the past two years, MITH worked to generate, organize, and refine metadata for the *Lakeland Digital Archive* collections from multiple sources. MITH's archivist Stephanie Sapienza consolidated and organized the archive, merging the data and digital files from the website with additional data from hard drives, DVDs, cassettes, and jump drives that have accumulated over the course of the project's lifecycle. To track the consolidated data, Sapienza used Airtable (discussed above). The Lakeland Airtable database tracks a) the disparate objects and their provenance, b) authority records (People, Places, and Organizations), c) a custom subject thesaurus of terms specific to Lakeland's ontology, and c) metadata profiles which serve as connective tissue across all object types. Working with Summers, Sapienza also used the Airtable base as a mechanism for identifying and removing duplicate files, extracting and preserving the files' original file paths so that the team could harvest metadata from the paths at a later time. Sapienza also conducted early testing of the Oral History Metadata Synchronizer (OHMS), an open source application that breaks oral histories into manageable chunks using indexed points of entry, as well as the upload of transcripts and custom thesauri. Histories can be searched by keyword, which can be found in either the structured metadata/subject terms, the transcripts, or the indexed sections. The collection data is currently held in trust on servers controlled by MITH with the goal (that this project will advance) of returning the digital materials to Lakeland. Work on this project will take place on the University Maryland campus, at the College Park Community Center in the Lakeland neighborhood, and in the homes of Lakelanders.

Previous financial support of projects involving the *Lakeland Digital Archive* includes $12,000 from the National Endowment for the Humanities Common Heritage program in 2018 for *Change and Resilience in Lakeland: African Americans in College Park, MD 1950-1980*, which will include a day-long digitization event, by-appointment collecting visits to Lakelanders' homes, and a public interpretation event to explore and present the history of Lakeland to a broader public. The project also received a $3,000 American Studies Association Community Partnership Grant in 2018 to provide stipends for summer interns working with LCHP, UMD's American studies department, and MITH to collect oral histories from Lakeland residents and a $1,500 College Park Community Foundation Grant to collect, digitize, and publish a selection of memorabilia collected by Lakeland Community High School's last graduating class of 1952, whose members are now in their 80s.

Since this project will be part of an ongoing community-institutional partnership, additional collection, archival, and interpretation activities related to the core work of the grant will continue after the period of performance. While further refinement of the prototype digital collection will be part of that effort, a larger portion will involve continued testing and community training as well as dissemination of research results for the use of other communities.

Work Plan. Project activities will occur over 17 months from February 2020 through June 2021. In the first quarter, team members will attend the NEH Project Directors meeting (Munoz); hire and onboard community consultant (Munoz, Sapienza) to ensure that the project will directly involve a member of the Lakeland community who has both personal connections to the community, as well as the ability to manage the process of holding workshops and organizing/documenting

feedback. After this, the key milestones will involve at least four community design workshops in April and October 2020, January and April 2021 (Community Consultant TBD); purchasing Raspberry Pi kits for use and testing of dissemination of physical media to the community, either offline or through local networks (Summers, Community Consultant TBD); three documentation sprints in May/November 2020 and March 2021 devoted to the production of the documentation website and accompanying resources (Munoz, Sapienza, Summers, Community Consultant TBD) and final reporting.

The project will employ an "agile" methodology, incorporating evaluation of the usability of the prototype digital collection at each community design workshop. A key risk is overinvestment of time in complex technological development that does not serve the Lakeland community's needs—resulting in software or tools based on Raspberry Pi that are too complex to be adopted by community members and therefore hinder community ownership. In addition to the formal evaluations at each community workshop therefore, the project will work closely with the LCHP board of directors to ensure communication between the team and the community as well as overall community governance of the work.

A more detailed version of the work plan is included as an Appendix.

Final Product and Dissemination. Final products from this project will take two principal forms: the prototype instance of the *Lakeland Digital Archive* and a documentation website with guides and other resources for applying minimal computing approaches in community-led digital archives and thematic research collections projects. Accessibility of these final products to differently-abled users will be a key design priority that the team will integrate throughout the period of performance and also evaluate as part of the final report. Based on previous work with LCHP, the project team knows that elderly, low vision, and low hearing users (some community elders) are part of the core audience for the *Lakeland Digital Archive*. Text alternatives and captions for images and other graphical elements as well as closed captions for audio and video content will be present across all project websites. All sites will meet Web Content Accessibility Guidelines (WCAG) published by the World Wide Web Consortium (W3C).

Items in the prototype instance of the *Lakeland Digital Archive* will published online under licenses determined by the community members who are stakeholders in the process. In keeping with MITH's Statement of Values, the project will prioritize openness while respecting the community's rights to govern use of their cultural materials. Given the emphasis in this project on providing offline and local access to digital collections, some items may not be available on the open web but rather held as digital copies by Lakelanders.

The documentation website created specifically for this project will be published online as a "Free Cultural Work" to facilitate maximum reuse and extensibility. During the period of performance and for no less than five years afterward, both of these resources will be maintained online at their original web addresses. (After five years, visitors to these sites may be redirected to a web address that provides a modified or archival version — see "Data Management Plan".) The contents of the documentation site will also be produced in PDF format and deposited in an appropriate digital repository such as Humanities Commons.

Another key aim of this project is to reuse existing open source software (for static site generation, Raspberry Pi computing, file sharing, etc.) rather than to develop new software. The "recipes" for using these software tools for community digital collections will be core to the documentation website. If any project-specific scripting or software development is necessary, the source code will be made available under an open license through MITH's institutional GitHub account. Additional copies of any project source code will be deposited to the Zenodo digital repository, which integrates with GitHub, to facilitate long-term preservation of project software.

Appendix: Work Plan

Task	Start date	End date	Category	Depends on	Assigned to	Description
Hire and onboard community consultant	2/1/2020	3/15/2020	administration		Trevor Muñoz, Stephanie Sapienza	This first step will ensure that the project will directly involve a member of the Lakeland community who has both personal connections to the community, as well as the ability to project management the process of holding workshops and organizing/documenting feedback.
Community design workshop #1	4/1/2020	4/30/2020	events	Hire and onboard community consultant	Community Consultant, Stephanie Sapienza	This first workshop will invite members of the Lakeland community from all ages to use the the working version of the Lakeland Digital Archive as it will exist at the beginning of the grant period, and give targeted feedback for improvement and usability.
Attend NEH Project Directors meeting	4/1/2020	4/30/2020	administration		Trevor Muñoz	Muñoz (and potentially Sapienza and Summers) will attend the NEH Project Directors meeting.
Documentation sprint #1	5/1/2020	5/31/2020	writing and documentation		Trevor Muñoz, Stephanie Sapienza, Community Consultant, Ed Summers	Documentation sprints will be focused periods of time to document processes and workflows.
Refine Airtable API connections	5/15/2020	6/30/2020	development		Ed Summers	Based on testing and feedback from the first community design workshop, existing connections to the Airtable API will be tweaked for integration into the static site.
Public beta of Lakeland Digital Archive	7/1/2020	7/31/2020	development	Refine Airtable API connections, Community design workshop #1		The project team will share a working version of the Lakeland Digital Archive online and with community members who have not participated directly in design workshops.
Acquire Raspberry Pi kits	8/1/2020	8/31/2020	administration		Stephanie Sapienza	Purchasing Pi kits for use and testing of dissemination of physical media to the community, either offline or through local networks.
Set up Raspberry Pi kits for locally-networked, offline distribute of Lakeland Digital Archive	9/1/2020	9/30/2020	development	Acquire Raspberry Pi kits	Ed Summers, Jeremy Boggs	
Community design workshop #2	10/1/2020	10/31/2020	events	"Set up Raspberry Pi kits for locally-networked, offline distribute of Lakeland Digital Archive"	Community Consultant	
Documentation sprint #2	11/1/2020	12/15/2020	writing and documentation		Community Consultant, Stephanie Sapienza, Trevor Muñoz, Ed Summers	
Community design workshop #3	1/15/2021	2/15/2021	events		Community Consultant	
Documentation sprint #3	3/1/2021	4/15/2021	writing and documentation		Trevor Muñoz, Stephanie Sapienza, Ed Summers, Community Consultant	
Set up Raspberry Pi kits for non-visual interface device prototyping, especially for oral history content	3/15/2021	4/15/2021	development		Trevor Muñoz, Ed Summers, Jeremy Boggs	
Community design workshop #4	4/21/2021	5/21/2021	events	Documentation sprint #3,"Set up Raspberry Pi kits for non-visual interface device prototyping, especially for oral history content"	Community Consultant	
Community design workshop #5	6/1/2021	6/30/2021	events		Community Consultant	
Final project reporting	6/15/2021	8/31/2021	administration		Trevor Muñoz, Jeremy Boggs, Maxine Gross	Preparation of the final project report, publication to Humanities Commons repository.

Data Management Plan

This data management plan was created on June 18, 2019, for submission to the Office of Digital Humanities (ODH), National Endowment for the Humanities as required by ODH Guidelines in the interest of securing funding for this project under the Digital Humanities Advancement Grant program. This is the first version of the data management plan associated with this data.

Roles and Responsibilities

Principal Investigator Muñoz will be responsible for implementing this data management plan in consultation with the Lakeland Community Heritage Project (LCHP) Board of Director. This responsibility is shared because data in the prototype digital collection belongs to the Lakeland community. It is expected that Muñoz will spend part of his 1% allocated effort per performance period working on data curation. At the end of the grant period, Muñoz will be responsible for depositing copies of project data in suitable digital repositories for long-term stewardship. Muñoz will delegate Summers to deposit copies of open source software in an appropriate respository (e.g. Zenodo)

Data Types and Formats

This project will generate several kinds of data:
- Text, images, and sound files representing items in the *Lakeland Digital Archive*
- Structured metadata records for digital items
- HTML pages (with accompanying CSS and Javascript) representing the documentation website
- (potentially) software source code

Text files represent transcripts of oral history recordings and are stored in plain text as well as SRT format. Images are stored in the highest resolution available depending on how they were acquired—either TIFF or JPEG. Structured metadata is stored as CSV files.

Source code for software created during this project is written in Javascript, a widely-used programming language for the web. All code is freely-available under open source licenses.

Data Storage and Preservation of Access

During the period of performance, all data will be stored on servers controlled by MITH and backed up nightly in both a local copy and a copy stored offsite in Amazon web services. One copy of source code for all project software will always be stored on servers managed by Github, a commercial repository service. Since these materials are available under open source licenses, there is no cost for data hosting and GitHub will allow ongoing access by other researchers. Other researchers will immediately have the opportunity to re-use and build upon software created by this project.

Additionally, at designated points throughout the project, related to workshops and the release of prototypes, complete copies of software source code will be downloaded from GitHub and deposited in another appropriate non-commercial repository such as Zenodo, or the Digital Repository at the University of Maryland (DRUM). Project PI Muñoz or his designee will be responsible for making similar deposits of text, image, and metadata files as appropriate.

The web application created for this project, and by extension its source code, is a form of secondary data. The web application source code will remain available through designated repositories but the project only commits to active maintenance of the running web application for 5 years after the end of the grant period. High-fidelity copies of the web application and website will be saved to the Internet Archive as well as the University of Maryland Digital Collections for permanent access if the project goes offline.

COLLEGES AND UNIVERSITIES RATE AGREEMENT

EIN: 15-20710851

ORGANIZATION:
University of Maryland - College Park
1132 Main Administration Building
College Park, MD 20742-5035

DATE:03/16/2018

FILING REF.: The preceding
agreement was dated
07/25/2013

The rates approved in this agreement are for use on grants, contracts and other
agreements with the Federal Government, subject to the conditions in Section III.

SECTION I: Facilities And Administrative Cost Rates

RATE TYPES: FIXED   FINAL   PROV. (PROVISIONAL)   PRED. (PREDETERMINED)

EFFECTIVE PERIOD

TYPE	FROM	TO	RATE(%)	LOCATION	APPLICABLE TO
PRED.	07/01/2016	06/30/2018	52.00	On-Campus	Organized Research
PRED.	07/01/2018	06/30/2021	54.50	On-Campus	Organized Research
PRED.	07/01/2016	06/30/2021	56.00	On-Campus	Instruction
PRED.	07/01/2016	06/30/2018	38.50	On-Campus	Other Sponsored Activities
PRED.	07/01/2018	06/30/2021	39.50	On-Campus	Other Sponsored Activities
PRED.	07/01/2016	06/30/2021	26.00	Off-Campus (A)	All Programs
PRED.	07/01/2016	06/30/2021	27.50	Off-Campus (B)	All Programs
PRED.	07/01/2016	06/30/2021	10.00	Off-Campus (A) & (B)	IPA*

ORGANIZATION: University of Maryland - College Park

AGREEMENT DATE: 3/16/2018

TYPE	FROM	TO	RATE(%) LOCATION	APPLICABLE TO
PROV.	07/01/2021	Until Amended		Use same rates and conditions as those cited for fiscal year ending June 30, 2021.

(A) Off-Campus, Remote - Activities performed outside commuting area of College Park, Maryland.

(B) Off-Campus, Adjacent - Activities performed within commuting area of College Park, Maryland.

IPA* - Intergovernmental Personnel Act Agreements

*BASE

Modified total direct costs, consisting of all direct salaries and wages, applicable fringe benefits, materials and supplies, services, travel and up to the first $25,000 of each subaward (regardless of the period of performance of the subawards under the award). Modified total direct costs shall exclude equipment, capital expenditures, charges for patient care, rental costs, tuition remission, scholarships and fellowships, participant support costs and the portion of each subaward in excess of $25,000. Other items may only be excluded when necessary to avoid a serious inequity in the distribution of indirect costs, and with the approval of the cognizant agency for indirect costs.

U27060

ORGANIZATION: University of Maryland - College Park

AGREEMENT DATE: 3/16/2018

SECTION II: SPECIAL REMARKS

TREATMENT OF FRINGE BENEFITS:

The fringe benefits are specifically identified to each employee and are charged individually as direct costs. The directly claimed fringe benefits are listed below.

TREATMENT OF PAID ABSENCES

Vacation, holiday, sick leave pay and other paid absences are included in salaries and wages and are claimed on grants, contracts and other agreements as part of the normal cost for salaries and wages. Separate claims are not made for the cost of these paid absences.

OFF-SITE DEFINITION: For all activities performed in facilities not owned by the organization and to which rent is directly allocated to the project(s), the off-site rate will apply. Projects partially performed off-site are apportioned between their on-site/off-site components when projects activity is conducted off-site for at least three consecutive months.

ORGANIZATION: University of Maryland - College Park
AGREEMENT DATE: 3/16/2018

Fringe Benefits Include: FICA, Retirement, Tuition Remission, Vision Care, TIAA/CREF, Unemployment Insurance and Health Insurance.

Equipment means an article of nonexpendable tangible personal property having a useful life of more than one year, and an acquisition cost of $5,000 or more per unit.

The RESEARCH base includes University expenditures related to grants and contracts conducted at the following facilities: Agricultural Experiment Station, Cooperative Extension Service.

Effective 07/01/10, the RESEARCH base no longer includes grants and contracts conducted by the University of Maryland Biotechnology Institute (UMBI). The Center for Advanced Research in Biotechnology (CARB) is now the Institute for Bioscience and Biotechnology Research (IBBR) and is a department of the University of Maryland - College Park.

APPLICATION OF INDIRECT COST RATES TO DOD CONTRACTS/SUBCONTRACTS:

In accordance with DFARS 2231.303, no limitation (unless waived by the institution) may be placed on the reimbursement of otherwise allowable indirect cost rates incurred by an institution of higher education under a DOD contract awarded on or after November 30, 1993, unless the same limitation is applied uniformly to all other organizations performing similar work. It has been determined by the department of Defense that such limitation is not being uniformly applied. Accordingly, the following rates do not reflect the application of the 26% limitation on administrative indirect costs imposed by 2 CFR 200.

```
PRED. 07/01/18  to  06/30/21  57.0% On-Campus  Organized Research
PRED. 07/01/18  to  06/30/21  28.5% Off-Campus Orgn. Research (A)
PRED. 07/01/18  to  06/30/21  30.0% Off-Campus Orgn. Research (B)
PROV. 07/01/21  Until Amended        Use Same rates and conditions as those
cited for fiscal year ending June 30, 2021.
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(A) Off-Campus, Remote - Activities performed outside commuting area of College Park, Maryland.

(B) Off-Campus, Adjacent - Activities performed within commuting area of College Park, Maryland.

SECTION III: GENERAL

A. LIMITATIONS:

The rates in this Agreement are subject to any statutory or administrative limitations and apply to a given grant, contract or other agreement only to the extent that funds are available. Acceptance of the rates is subject to the following conditions: (1) Only costs incurred by the organization were included in its facilities and administrative cost pools as finally accepted: such costs are legal obligations of the organization and are allowable under the governing cost principles; (2) The same costs that have been treated as facilities and administrative costs are not claimed as direct costs; (3) Similar types of costs have been accorded consistent accounting treatment; and (4) The information provided by the organization which was used to establish the rates is not later found to be materially incomplete or inaccurate by the Federal Government. In such situations the rate(s) would be subject to renegotiation at the discretion of the Federal Government.

B. ACCOUNTING CHANGES:

This Agreement is based on the accounting system purported by the organization to be in effect during the Agreement period. Changes to the method of accounting for costs which affect the amount of reimbursement resulting from the use of this Agreement require prior approval of the authorized representative of the cognizant agency. Such changes include, but are not limited to, changes in the charging of a particular type of cost from facilities and administrative to direct. Failure to obtain approval may result in cost disallowances.

C. FIXED RATES:

If a fixed rate is in this Agreement, it is based on an estimate of the costs for the period covered by the rate. When the actual costs for this period are determined, an adjustment will be made to a rate of a future year(s) to compensate for the difference between the costs used to establish the fixed rate and actual costs.

D. USE BY OTHER FEDERAL AGENCIES:

The rates in this Agreement were approved in accordance with the authority in Title 2 of the Code of Federal Regulations, Part 200 (2 CFR 200), and should be applied to grants, contracts and other agreements covered by 2 CFR 200, subject to any limitations in A above. The organization may provide copies of the Agreement to other Federal Agencies to give them early notification of the Agreement.

E. OTHER:

If any Federal contract, grant or other agreement is reimbursing facilities and administrative costs by a means other than the approved rate(s) in this Agreement, the organization should (1) credit such costs to the affected programs, and (2) apply the approved rate(s) to the appropriate base to identify the proper amount of facilities and administrative costs allocable to these programs.

BY THE INSTITUTION:

University of Maryland - College Park

(INSTITUTION)

Digitally signed by Laurie E. Locascio
DN: cn=Laurie E. Locascio, o, ou,
email=lel@umd.edu, c=US
Date: 2018.04.16 13:49:26 -04'00'

(SIGNATURE)

Laurie E. Locascio

(NAME)

Vice President for Research

(TITLE)

4/16/2018

(DATE)

ON BEHALF OF THE FEDERAL GOVERNMENT:

DEPARTMENT OF HEALTH AND HUMAN SERVICES

Darryl W. Mayes -S

Digitally signed by Darryl W. Mayes -S
DN: c=US, o=U.S. Government, ou=HHS, ou=PSC,
ou=People,
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cn=Darryl W. Mayes -S
Date: 2018.03.26 14:23:08 -04'00'

(SIGNATURE)

Darryl W. Mayes

(NAME)

Deputy Director, Cost Allocation Services

(TITLE)

3/16/2018

(DATE) 7060

HHS REPRESENTATIVE: Steven Zuraf

Telephone: (301) 492-4855

COMPONENTS OF PUBLISHED FACILITIES AND ADMINISTRATIVE COST RATE

Institution: **University of Maryland, College Park**

FY Covered by Rate: July 01, 2016 - June 30, 2021

Type of Rate:

Organized Research

RATE COMPONENTS:	ON FY'17-'18	ON FY'19-'21	OFF FY'17-'21	OFF Adjacent FY'17-'21
Bldg & Improv - Depr/Use Allow	3.5	3.5		
Equipment - Depr/Use Allow	2.0	3.5		
Interest	0.4	0.4		
Operations & Maintenance	18.6	19.6		
Library	1.5	1.5		1.5
Administrative Component	26.0	26.0	26.0	26.0
Total	52.0	54.5	26.0	27.5

Instruction

RATE COMPONENTS:	ON FY'17-'21	OFF FY'17-'21	OFF Adjacent FY'17-'21
Bldg & Improv - Depr/Use Allow	4.1		
Equipment - Depr/Use Allow	1.0		
Interest	0.4		
Operations & Maintenance	16.0		
Library	8.5		1.5
Administrative Component	26.0	26.0	26.0
Total	56.0	26.0	27.5

Other Sponsored Activity

RATE COMPONENTS:	ON FY'17-'18	ON FY'19-'21	OFF FY'17-'21	OFF Adjacent FY'17-'21
Bldg & Improv - Depr/Use Allow	1.5	2.0		
Equipment - Depr/Use Allow	1.0	1.0		
Interest	0.2	0.2		
Operations & Maintenance	8.3	8.8		
Library	1.5	1.5		1.5
Administrative Component	26.0	26.0	26.0	26.0
Total	38.5	39.5	26.0	27.5

CONCURRENCE:

Signature

Laurie E. Locascio
Name

Vice President for Research
Title

4/16/2018
Date