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Collaborating Sites:

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Acknowledgments

Narrative

Enhancing the Humanities through Innovation

BrailleSC combines expertise from the disciplines of English, Education, History, and Computer Science. An accessible, scholarly resource concerning braille literacy in South Carolina, *BrailleSC* (http://braillesc.org/) as been online for over a year and has already been visited thousands of times, with individuals from around the world accessing our content. The site includes oral histories from individuals about their experiences with braille in everyday life, pedagogical materials to assist teachers in developing best practices in braille instruction, and resources for families that stress the importance of braille literacy and the methods of braille instruction.

Accessibility is important because disabled users need to be able to participate fully in humanities research and teaching. Further, in providing accessibility tools to disabled communities we are able to enrich their individual research and learning efforts beyond the formal educational process. As the insights of scholars working in disability studies in the humanities have shown, creating tools for individuals with disabilities improves digital environments for all users.

Our project will use NEH funds to continue efforts begun in our Level I Digital Humanities Start-Up Grant to develop accessibility tools that integrate easily with the popular content management and publication platform, WordPress. WordPress, a commonly-used blogging and publishing platform, focuses on aesthetics, web standards, and usability and is available as an open-source download as well. Over the last two years, we have developed plug-ins that have been designed with the needs of visually impaired users in mind. Visually-impaired (VI) users access digital information in different ways than other users. For example, VI users navigate information by listening to a synthesized voice reading textual material aloud to them generated from a software platform referred to as a "screen reader." To make navigation easier for VI users, our "Access Keys" plug-in allows users to get from page to page and section to section by pressing an easy-to-remember combination of keys. Other users require text enlargement, and our "Text Zoom" plug-in changes the size of the text to meet their needs.

The first phase of our project focused on meeting the needs of blind and low-vision endusers, and we will continue along this successful path by extending the use of Anthologize--which is a free and open source plug-in for WordPress that currently translates RSS text into PDF, ePub, and TEI--to include the conversion of text to contracted braille. As a result, we will not only make it possible to easily convert text into braille files suitable for embossing onto paper, thereby extending humanities content to hundreds of thousands of blind or low-vision readers, but we will also experiment with making braille available visually on-screen through the WordPress interface.

We are requesting $45,936 in funding to support this effort. Funding to support the development of this tool will set our project apart from most digital humanities projects

by focusing not just on delivering content in a new manner but by directly addressing the needs of under-served, but vital communities. Further, the tools developed as part of this project will enrich any other project utilizing WordPress by providing them with tools to reach a wider audience of endusers.

As a result of our existing collaboration with the South Carolina School for the Deaf and Blind, we have access to users across the state with a variety of sensory disabilities. They will serve as our prototype assessment team and provide an experienced team of assessors with real-life experience.

Technical Innovations Benefiting Humanities Research and Teaching

With the support of this grant, we will develop a braille translation system as a plug-in for the existing BrailleSC project. Our system will be based on liblouis, the popular open-source braille translation engine <http://code.google.com/p/liblouis/>. This engine features support for computer and literary braille, for contracted and uncontracted translation for several dozen natural languages, three braille mathematics and many document formats such as DTBook XML, DocBook, and Microsoft Word XML. Written in C advanced computer language, liblouis can be easily compiled to adapt to variety systems. Our translation tool will be a two-tiered system: the client and the server. The client will be designed as a plug-in to WordPress so that any WordPress-based website can use our system. The client will first transform the online content into an electronic book. The electronic book will be further passed to the server as processing input. Once the result returns, our client will display or print the result in a designated area. The WordPress plug-in Anthologize <http://www.Anthologize.org> is already able to transform postings into an electronic book. We will extend Anthologize to include pages and comments. The translation server will exist between the web server and the liblouis translation engine. It will strip requests down to individual commands, pass them to the liblouis translation engine, and return results back to web server. We will write our system in PHP to be compatible with WordPress. (See further details in Appendix.)

Significance and Impact

The importance of inclusion: Our work aims to increase participation by all people in experiencing and creating scholarly digital projects. The barriers to participation are varied and include such obstacles as the high price of specialized software and hardware, the advanced expertise that such software and hardware often requires, and the thoughtless design choices that can prevent endusers with sensory disabilities from taking full advantage of online resources.

The importance of proper formatting in braille: Correct braille formatting is critically important as it provides clarity for the reader and allows the braille reader to easily navigate the materials. Just as in well-formatted HTML documents, formatting in braille is highly structured and enables readers to quickly pick out information by scanning the page with their hands and jumping from section to section, if necessary. Inconsistent or incorrect formatting can slow the reader and lead to frustration or abandonment of the

document being read. As in print publications, capitalization and punctuation of items in a list would follow the same format in braille as in print. However, lists transcribed into braille are always preceded and followed by a blank line, regardless of whether a blank line would be used in print. In addition, when bullets precede all items in a list in print, then the bullets are ignored in braille. Thus, depending on the format of what is being transcribed, materials may or may not follow the same format as the print version.

The importance of a free online braille translator: Online information is most-commonly available to blind individuals via computerized speech output from a screen reading software application. While in some situations, accessing online information with a screen reader may be adequate, listening is not adequate in all situations; especially if an individual needs to have specific information presented in a table or chart (to name just two examples.) Reading braille provides a deeper understanding of the content for many individuals. Yet producing well-formatted braille files is accomplished through one of two expensive methods. First, professionals who are certified braille translators may be hired to create well-formatted braille. Second, a number of commercial braille translation software applications may be used. The most commonly-used applications cost several hundred dollars and are cost-prohibitive to low-income users and non-specialized humanists. Thus, creating a free and easy-to-use online braille translator would make a tremendous difference in the lives of individuals who need braille translations of online content, in the work flow of content creators, and in the ability of humanities researchers to reach braille audiences.

Environmental scan

Braille translation tools

Currently, a few online braille translation systems are available. These systems include the following:

"libbraille," which translates Unicode text to braille

< http://libbraille.org/>

"Braille Translator" from Mathsisfun

<http://www.mathsisfun.com/braille-translation.html>

The "On-Line Braille Generator"

<http://braille.compelo.com/>

An "Online Braille Generator," from Byron Knoll

<http://people.cs.ubc.ca/~knoll/braille.html>

These applications allow users to paste snippets of text for translation into braille and then see the result displayed on the screen. This information may not be accessible to individuals using screen readers. Their support for a variety of input formats is limited, and none of them can automatically translate between text and braille.

Additionally, a number of desktop software applications or word exist, such as the following:

Louis braille Translator (free standalone application, Mac-only)

<http://www.cucat.org/projects/louis/>

odt2braille (free plug-in for Open Office Writer, Mac-compatibility problems)

<http://odt2braille.sourceforge.net/>

Duxbury braille Translator ($595.00 for a single user license), and

Duxbury MegaDots ($595 for a single user license)

<http://www.duxburysystems.com/>

These applications feature much more advanced functions than the existing online systems. However, the free applications have fewer advanced features than the commercial applications, and the commercial applications are prohibitively expensive and require training to use in order to produce accurate and well-formatted braille.

Our braille translation tool will be free, user-friendly, and will generate well-formatted contracted braille through an online environment.

History and duration of the project

Originally funded by a campus-based grant designed to encourage undergraduate research projects, Dr. Williams and Cory Bohon, a USC Upstate Undergraduate student, began exploring the possibilities for making Omeka a more accessible platform in the Fall of 2009. After discussing their progress with Dr. Herzberg in late Fall of 2009, they agreed to collaborate with her on creating an online archive of materials related to braille and braille literacy in everyday life. By the middle of Spring 2010, Mr. Bohon had developed working versions of a few different Omeka plug-ins and a handful of oral histories had been recorded on video and subsequently transcribed. At around the same time, Dr. Williams and Dr. Herzberg approached the Center for Digital Humanities (CDH) in Columbia, SC and were pleased with the enthusiastic response they received to their request for collaboration. Since then, the CDH has provided technical support and server space as needed. The CDH is currently re-configuring their staff and program arrangements, so the current proposal describes a project-specific collaboration between individuals at USC Upstate and those at a different digital humanities center who are also interested in addressing accessibility issues.

Last summer, the accessibility plug-ins were refined. For instance, to make navigation easier for these users, our "Access Keys" plug-in allows users to get from page to page and section to section by pressing an easy-to-remember combination of keys. Additionally, our site underwent extensive usability testing by individuals who have low vision and need screen magnification as well as by blind individuals who use screen readers. Their feedback led to refinements, and we are fully confident that our online resource is totally accessible to individuals who are blind or visually impaired. Their feedback also assisted us in the development of phase two activities and the goals we plan to reach with the support of a Level 2 Start-up grant from the National Endowment

for the Humanities, Office of Digital Humanities. Dr. Jennifer Guiliano, formerly of the Center for Digital Humanities and now with the Maryland Institute for Technology in the Humanities, and her team have conducted a feasibility study, and we are confident that, with adequate funding, we will design and deploy a free and easy-to-use tool that will enable endusers with a variety of disabilities and abilities to access online humanities resources.

Work plan, Academic Year 2012-2013

Month 1

- Technical Assessment of Louis <http://www.cucat.org/projects/louis/> and Anthologize <http://anthologize.org/>; Development of Integration PHP Framework (Williams, Dickie).
- Evaluation of braille produced with Louis (coordinated by Herzberg, Williams)

Month 2-4

- Programming of Louis to extend it to braille audience (Dickie) via PHP-server design and formulation of processing input

Month 4-5

- Programming of Louis to extend it to braille audience (Dickie) via PHP-client design and formulation of processing output
- WordPress plug-in front-end display aesthetics design (Keister)
- Evaluation of braille produced with Louis (coordinated by Herzberg, Williams)

Month 6-7

- Programming of Anthologize to integrate with Louis platform via PHP engine (Dickie)

Month 7-9

- Integration of Social Media aspects including pages and comments (Dickie)
- Revision of Graphic User Interface Aesthetics based on user evaluation (Keister)

Month 10

- Creation of Public Documentation regarding Anthologize-braille (Guiliano, Williams, Keister)
- Establishment of Code Repository for all produced code (Dickie)

Month 11-12

- Braille user testing (Williams, Herzberg)
- Revision of functionality based on user feedback (Dickie)

Project Staff

BrailleSC will combine participant expertise from the disciplines of English, education, and computer science. The core members include Dr. George H. Williams, Assistant Professor, Languages, Literature, and Composition department at USC Upstate; Dr. Jennifer Guiliano, Assistant Director, Maryland Institute for Technology in the Humanities at the University of Maryland, College Park; Dr. Tina Herzberg, Assistant Professor, School of Education at USC Upstate; J. Grant Dickie, Programmer, Maryland Institute for Technology in the Humanities at the University of Maryland, College Park; and Kirsten Keister, Graphic Designer, Maryland Institute for Technology in the Humanities at the University of Maryland, College Park.

Final product and dissemination

Our code will be released as open-source code and included in both the WordPress plug-in library and GitHub. All content—including oral histories, pedagogical materials, documentation of software, braille files—will continue to be made available under a Creative Commons Attribution-Noncommercial-ShareAlike license. We will develop easy-to-follow instructions for how to use all software we develop. The Center for Digital Humanities at the University of South Carolina, Columbia will continue to provide long-term hosting for all tools and content associated with this project. We will discuss our work at THATCamp CHNM 2013 and will present our work as well as at the 2013 meetings of two conferences: Computers and Writing, and Digital Humanities. Finally, we will release a white paper at the project's conclusion explaining what we've learned about various options for creating online braille documents.