Supporting Digital Scholarship: Jump-starting Digital Humanities

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Associate Dean for Digital Library Innovation

- Explore possibilities for digital humanities and digital material processing
- Explore opportunities for extramural funding
- Jump start projects
- One-person operation

- Former University Librarian Bill Walker
- Arts & Sciences Dean Leonidas Bachas
- New University Librarian Charles Eckman
Digital Humanities

• Conducts humanities scholarship through aggressive use of digital technologies
  – Digital source material generation
  – Data generation from source
  – Data analysis
  – Presentation and visualization
  – Data curation and archiving
  – Software packaging
Issues 1

• Technical
  – Materials are not digitized
  – Data generation is technically challenging
Issues 2

• Political
  – Needs collaborations among humanists, technologists, and librarians
  – Collaboration is a foreign concept to most humanists
  – Strong skepticisms about the value of digital scholarship
    • Junior faculty may not wish to conduct digital humanities research
Issues 3

• Systematic
  – Digital humanities scholarship is for humanistic research
    • Results must be examined from a humanistic perspective
  – Digital humanities scholarship can be time consuming
    • Any part of the process may require substantial effort and cost
Initial Investigation

- Met with a score or so non-science scholars to explore their interests, in particular, the need for custom software development
Challenges at UM

• A very few humanities faculty conduct or are interested in digital humanities research
• Interesting digital materials exist in the library, but many of them are still in raw formats and require processing
Operational Principle

• Two possible approaches for promoting digital humanities:
  1. Show what other scholars have done at other institutions to drum up interests among the audience
  2. Work with interested scholars to jump-start projects
Activities to Date

• Tried to entice humanities scholars for digital projects
• Examined possibilities for generating textual data from the library’s digital collection
• Written a number of proposals
  – Two Andrew W. Mellon Foundation Grants
  – Two NEH proposals (one declined, one pending)
  – One NSF pending proposal
Project List

• Digital Humanities Projects
  1. Text-mining of Horace and Virgil
  2. Software development for a digital archive of theater productions
  3. Handwritten mediaeval Latin text transcription and computational correction
  4. Text-mining of the Carlyle letter collection

• Library Projects
  5. Information extraction from university newspapers
  6. Mining library patrons resource use
1. TEXT-MINING OF HORACE AND VIRGIL
Text-mining of Horace and Virgil

- Collaborator: Jennifer Ferriss-Hill, Assistant Professor of Classics
- Find clusters of unique words in Horace (BC65 – BC8)’s “Odes” when lexical endings are ignored
- Those words may be under influence of Virgil’s “Aeneid”
Method

- Collected files from the Latin Library
- Program
  - Preprocess the html files
  - Dictionary look-up for root-form identification
    - “Whittaker’s Words”
  - Identify and cluster unique words
  - Generate html files that show clusters and links among the identified words

- Example: [Horace-1-3-Sample.html](Horace-1-3-Sample.html)
Results

• From Jennifer’s presentation abstract: “Horace figures the *Aeneid* as a ship transporting Virgil through arduous (literary) hazards into Greek territories, taking him further away from Horace’s own satirical and lyric interests…. I show through these results the extent to which Horace in writing Odes 1.3 borrowed from the *Aeneid*’s vocabulary and imagery.”
Work to Do

• Improve the program
  – No false negatives, but quite a bit of false positives:
    • Proper nouns
    • Archaic forms
    • Irregular verbs
2. DIGITAL ARCHIVE OF THEATER PRODUCTIONS
Cuban Theater Digital Archive

• An archive of theater productions by Cuban artists, both in Cuba and in the states
  – Archive Director: Lillian Manzur, Assoc. Prof. of Modern Language and Literature

• Videos and images

• Recurrent support from the Andrew W. Mellon Foundation
Goals of the Current Development Efforts

1. Develop a platform on top of Django
2. Add a search engine component using Solr
3. Add Twitter feeds
4. Add tags and comments via Disqus
5. Add publication capability via University of Southern California’s “Scalar” project

- Software development is being provided by the Center for Computational Science’s Software Engineering Group
Current Status

• Most of the goals completed
• Presentations
• Publications of the project

• CTDA
3. HANDWRITTEN LATIN MANUSCRIPT RECOGNITION
Goal

• Develop tools for generating candidate transcriptions of Carolingian Latin manuscripts through OCR of handwritten texts
• Eventually ... develop a database of images and transcriptions of some Carolingian manuscripts
Collaborator/Sponsor

• Collaborator
  – Wilson Shearin, Assist. Prof. of Classics, U. Miami
  – Dimitris Papamichail, Assist. Prof. of Computer Science, The College of New Jersey
  – Gavriil Tsechpenakis, Assist. Prof. of Computer Science, IUPUI

• Pilot funding from the Andrew W. Mellon Foundation
Approach

• Examine two off-the-shelf OCRs
  – ABBYY Fine Reader ... commercial
  – Tessaract ... open-source

• Provide extensive training

• Develop methods for error correction
  – Develop confusion matrices
  – Use Ngrams and tokenization
Current Status

• 60% accurate at the character level
  – Extremely difficult to train a system for hand-written characters

• 63% with computational correction
  – The low accuracy before correction makes it very difficult to correct errors

• We may need to design a preprocessing tool for improving OCR accuracy
4. CALENDAR EVENT EXTRACTION
Goal

- University of Miami’s faculty/staff newspaper “Veritas”
- Extract event information from “Upcoming Events” section.
- Collaborator: Koichi Tasa, University Archivist

MONDAY - APRIL 24
Department of Physiology and Biophysics. Dr. Robert Paquet, “Age Dependent Changes in Mitochondria.” 4 p.m., Rm. 411, MSB.

TUESDAY - APRIL 25
Rosenstiel Distinguished Lecture Series. Dr. Norman B. Marshall, senior principal scientific officer, department of zoology, British Museum, London. “Simplicity and Complexity in the Ocean.” 3 p.m., Marine Science Center auditorium, RSMAS.

WEDNESDAY - APRIL 26
Biomedical Engineering Seminar. Dr. Jacob Kline, director, UM biomedical engineering program. “Patient Safety — Electrical Shock Hazards.” 4 p.m., auditorium, MCCD.


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Process for Calendar Generation

• Scan the prints (TIFF)
• TIFF to low-resolution PDF
• Assemble multiple pages into a single PDF file
• Run an OCR (ABBYY 11)
• Run an event extraction code to generate an event data file
• Hand-edit the event data files for correction
• Convert the event data file to an iCalendar file

• Sample
Things To Do

• Add geo-coding of location
• Add search-component
• Correct spelling errors
IN RETROSPECT
Lessons Learned

• There is competing time pressures on pre-tenure faculty

• Not being a humanist the whole experience is interesting but time consuming
  – Wound up spending more than 1/3 of time
  – Productivity in the main field declined

• Nicer to work with a team of technologists than to work alone
How Much Was DH Promoted?

• Those scholars I worked with, and those who are around them, are appreciative of the collaboration and enjoyed seeing what technologies could do to explore humanistic questions

• Beyond those people may have skepticisms about the operation and sense of danger having non-humanists poking a nose into humanities research
Future

• Need more propaganda for digital humanities
• Need more resource for promotion
• An inter-school task force is about to be established to consider the future of digital humanities is about to be organized
  – Inventory of technologies, interests, and expertise at the university
  – Having conversations with groups outside the university
  – Recommendations for the future
Thank you so much for listening!