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

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

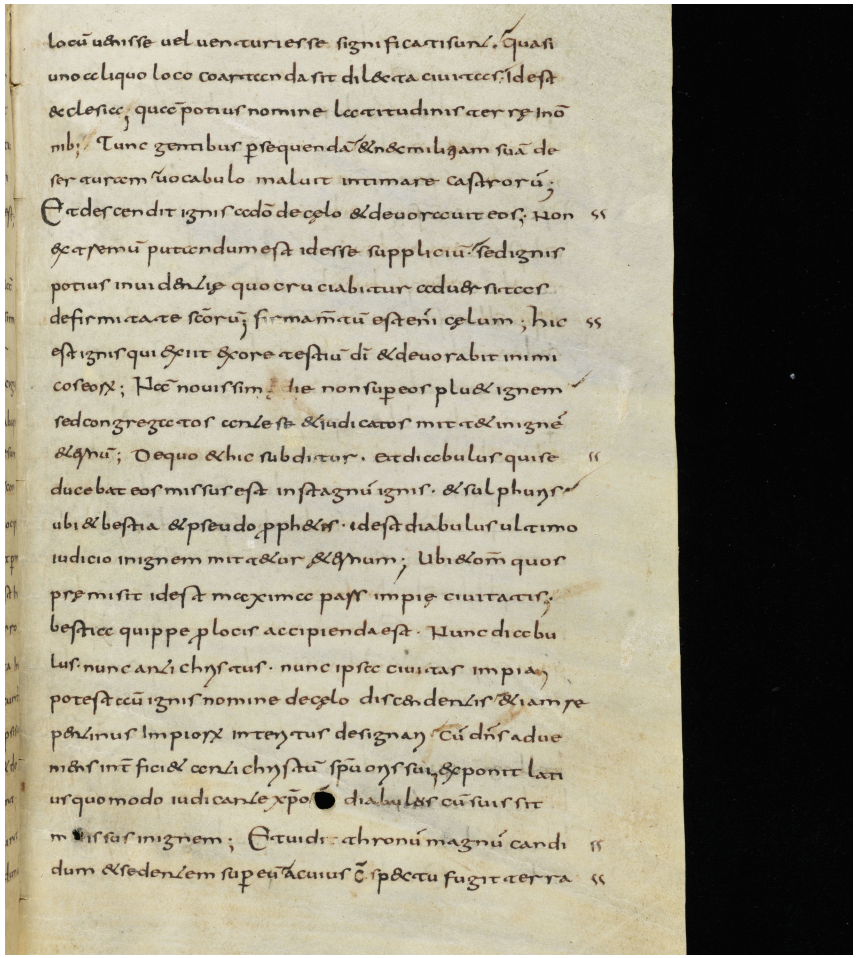
Collaborator/Sponsor

- 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

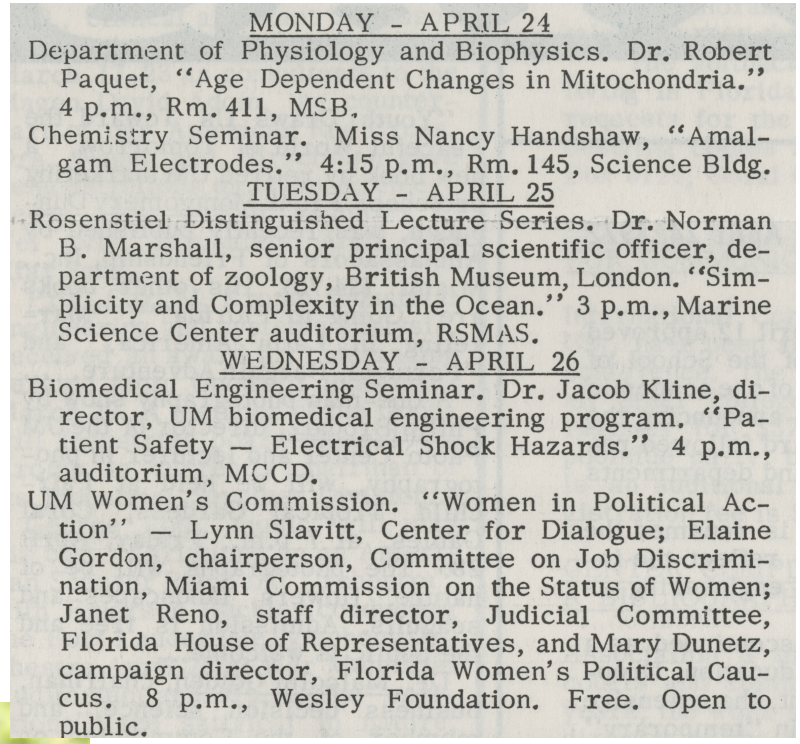
- 60% accurate at the character level
  - Extremely difficult to train a system for hand-written characters
- 63% with computational correction
  - The low accuracy before correction makes it very difficult to correct errors
- We may need to design a preprocessing tool for improving OCR accuracy

4. CALENDAR EVENT EXTRACTION

Goal

- University of Miami's faculty/staff newpaper "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.

Chemistry Seminar. Miss Nancy Handshaw, "Amalgam Electrodes." 4:15 p.m., Rm. 145, Science Bldg.

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.

UM Women's Commission. "Women in Political Action" — Lynn Slavitt, Center for Dialogue; Elaine Gordon, chairperson, Committee on Job Discrimination, Miami Commission on the Status of Women; Janet Reno, staff director, Judicial Committee, Florida House of Representatives, and Mary Dunetz, campaign director, Florida Women's Political Caucus. 8 p.m., Wesley Foundation. Free. Open to public.

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!