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Steven I. Van Tuyl
Carnegie Mellon University, svantuyl@andrew.cmu.edu

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Mind the Gap: Building Bridges Between Student Research and Library Technology with BiblioTech Labs

Steven Van Tuyl - Emerging Technologies and Computer Science Librarian - Carnegie Mellon University
Esha Uboweja - BiblioTech Labs Student Researcher - Department of Computer Science - Carnegie Mellon University

Introduction
Like many other academic libraries, the Carnegie Mellon University (CMU) Libraries struggle to balance technological innovation with maintenance of current technological systems. This balancing act is increasingly disrupted by the need of the library, at the behest of faculty, staff, students, and librarians, to provide a technology positive space for academic endeavors.

As a response to this sense of “falling behind” on technology innovation, the CMU Libraries have initiated a new program, BiblioTech Labs, to engage undergraduate researchers in our School of Computer Science to help solve our technology challenges.

Students work with faculty in their departments and with faculty and staff in the University Libraries to solve real-world technology problems for the library space. The primary goals of BiblioTech Labs are to provide a meaningful research experience to undergraduate students, to give students experience working in a client-focused environment, and last, to produce technology solutions for the University Libraries.

Why Engage Undergraduates?
The boom in technology education can be seen at campuses across the country and many undergraduate programs offer independent study, capstone, or research programs to give students real-world project experience.

According to the Computing Research Association’s 2010-2011 Taubee Survey¹, there are 133 Computer Science undergraduate degree programs in the US with over 10,000 bachelor’s degrees awarded in CS in 2011. The Association for Computing Machinery stressed the need for significant project experience for Computer Science graduates². The BiblioTech Labs model seeks to take advantage of both the large number of CS students at the university and the need for significant experience on real software projects.

BiblioTech Labs: How Does it Work?
- Projects undertaken as Independent Study for course credit through student’s home department
- Student selects from our list of technology challenges or proposes a new challenge, and pitches their solution to the client (the BiblioTech Labs Librarian)
- Accepted projects undertaken across the course of a single semester in collaboration with CMU Librarians and a Faculty Advisor
- Students encouraged to present work at annual student research symposium

The Technology Challenges
- Automated Directional and Quick Reference - Take advantage of expertise at CMU in Machine Learning, Artificial Intelligence, and Robotics to automate some library processes
- User Interfaces for Electronic Content - Make browsing new e-content more intuitive and enjoyable, and offer new experiences with old e-content
- Wayfinding - Find solutions for locating library materials and services
- Bookshelf Usage - Track non-circulating usage of book and journal collections
- Study Area Availability - Identify, in real-time, the availability of study areas based on the presence/absence of users
- Book Shelf Organization - Develop methods for automating or augmenting shelf-reading activities

Current Project
Our current Student Researcher, Esha Uboweja, is working on a system to detect when students are using our study spaces in order to stream, real-time, the availability of study spaces to our library website. Using a web-connected camera and a suite of image processing algorithms, she has developed a basic system that she continues to improve and enhance.

References

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Contact Information
Steve Van Tuyl - Emerging Technologies and Computer Science Librarian
email: svantuyl@andrew.cmu.edu

[Diagram of research and development process]