

INNOVATION TO ENTERPRISE COMMERCIALIZATION SCHOLARS

2015-2016 ITEC TEAM PROJECTS

“Towards Commercialization of A Genomics Big Data-Driven Personalized Medicine Recommender Software Platform”

Faculty Mentor: Jake Chen, PhD

This project focused on business development tasks for a software platform “Approved Drug Recommender for Individualized Treatment (ADRIT)” a genomics big data-driven personalized medicine recommender. ADRIT will be able to recommend new therapeutic treatment “whether approved or repositioned” that match with individual patient’s collected genomic/functional genomic profiles organized around biological pathways. The use of pathway model for integration and simulating drug therapy effects is a key differentiating characteristics from traditional software system. ADRIT can assess the effect of a drug starting from the drug’s targeted proteins down to the disease-specific protein signaling cascade. It can be used to evaluate and compare several drug therapies and their potential benefits for a given individual in an N-of-1 style clinical trial. When adopted by practice, biopharmaceutical customers and clinical scientists can both benefit from such system to tailor existing therapy for individualized treatment plan, and to help reposition drugs from other disease indications. The commercialization will be performed in conjunction with Medeolinx, which already maintains good relationships with pharmaceutical companies through its technology services. This project will fund the prototype development of the ADRIT from the manual analysis that takes months per disease cohort down to several days, thus accelerating the pace of commercialization into products.

“Developing a Database Driven Customizable App for the Mathematics Assistance Center (MAC) Services”

Faculty Mentors: Kevin Berkopes, PhD; Brad McKinney, M.Arch II; Zebulun M. Wood, M.S.

The new paradigm for learning assistance centers moves beyond conceptualizing them as tutoring rooms meant for remediation. Instead, locally and nationally, these centers are becoming sites for informal peer-to-peer academic interactions meant to enhance the formal learning done in lecture and labs. This reflects an evolution in the business model for institutions of higher education to rethink how best to support student academic content success and development. The value proposition for students is to combine resources in safe collective environments where they gain access to high quality, cost effective education that does not rely solely on the lecture.

The Mathematics Assistance Center (MAC) at IUPUI is an example of such a learning center, that supported more than 37,000 student visits during the Fall 2015 semester. This support comes in the form of 3500 square foot physical space as well as a dynamic website that acts as a virtual hub for resources such as test preparation, online tutoring, formula sheets, videos, animations, and MAC generated tracking data. The necessary next step is how to find innovative ways to advertise,

communicate, and provide access to the services that the MAC now provides. One method that holds promise, to move beyond one-time announcements and word-of-mouth chatter, is to build a customizable database driven application that students will carry on their phones, tablets, and laptops. Rather than just a replication of the MAC virtual hub and services, this will allow students to customize their MAC experience. It is also intended to provide the MAC with direct access to the students, providing an advertising medium to educate and advertise about the MAC services and their potential benefits for students.

2014-2015 ITEC TEAM PROJECTS

“M(ath) A(ssistance) C(enter) Team”

Faculty Mentor: Dr. Kevin Berkopes, PhD

Synchronous online peer-tutoring has emerged as a means for students to access on-demand content based learning assistance from home, work, or campus. If you wish to teach mathematics in online synchronous learning mediums, then the tutoring interface should be designed based on best mathematics education practices. Creation of an interface to deliver high quality mathematical learning assistance. Mathematics education research has found that collaborative exploration, mentoring, and scaffolding have positive impacts on mathematical learning.

“Rethinking the Alphabet Through Mobile Communication”

Faculty Mentor: Craig McDaniel, PhD

The Alphabet Project is centered on the conceptual idea of Craig McDaniel. Through his research and ideation he has developed a way to rethink the traditional Roman alphabet. His goal is to develop options to re-think the alphabet, enhancing the flexibility of human expression in writing. The user can create an alphabet entirely out of images or colors, or design one that combines images or colors with traditional Roman letterforms.

“A Novel Approach for Motion Correction in DCE-MRI”

Faculty Mentor: Chen Lin, PhD, DABR

A team of students are conducting research exploring the viability of the new MRI technique that will enable improved motion correction for Dynamic Contrast Enhanced (DCE) MRIs. DCE-MRI utilizes contrast agent (CA) to track and analyze the functionality of the vascular system within tumors and nearby tissues. Therefore, it provides a non-invasive solution to quantify tissue vessel density, integrity and permeability and assess organ structure and function. This innovation will help doctors not only see organs more clearly, but also allow doctors to better understand how the organ functions.