iSchool Partnerships and Practices – information and proposal form

Please fill in the information below and upload the proposal form (in PDF format) at the secure submission website for consideration for presentation at the *iSchool Partnerships and Practices* track at the 2019 iConference in College Park, Maryland, USA. Please keep to the advised length or the proposal will not be considered for review.

Please consider also the key review criteria for selection:

- Transferability to other institutions
- Grade of innovation
- Pedagogical dimension
- Degree of knowledge transfer

Questions about the *iSchool Partnerships and Practices* track should be directed to the chairs of the track:

iSchool Best Practices Chairs

- Elke Greifeneder, Humboldt-Universität zu Berlin
- Sean McGann, University of Washington
- Timothy Summers, University of Maryland, College Park

For general questions about the iConference, please contact iConference Coordinator Clark Heideger.

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Title of submission:
Community and Industrial Partnerships for Improved Faculty Research and Student Experience in Biomedical Informatics

Area (please check the applicable area description with an x):
Curriculum
Teaching
Student experience ***X***
Research ***X***
Administrative management
Other (please enter the applicable keyword):

Submission abstract (max 150 words):
The Department of BioHealth Informatics at IUPUI School of Informatics and Computing has successfully built strong collaborations and partnerships with local communities, research centers, and biomedical technology industries. The department drafted a 5-year strategic plan to foster the teamwork and practice, which benefit both faculty and students. The department also recruited members for the BHI industrial advisory boards with diverse backgrounds from local industries, which strengthen our programs to meet the industrial needs, promote faculty interactions with local communities, and increase student employment opportunities. BHI faculty have been successful to build new collaborative projects and secure joint grants. Students have enriched learning experience from professional oriented projects and internships with local companies. The practices can be easily extended to other informatics disciplines easily.

Submission description (max 2,350 words):

1. Introduction:
Our campus, Indiana University Purdue University Indianapolis (IUPUI), is located next to downtown Indianapolis, the state capital. Indianapolis is the home of the IU School of Medicine, which is the only medical school in Indiana and also the largest medical school in the US. IUPUI is the leader for cross-disciplinary research and pioneer in biomedical research, surrounded by IU Simon Cancer Center, Regenstrief Institute, Eli Lilly, Dow AgroSciences, Indiana Bioscience Research Institute (IBRI), the Cook RegenTec, and multiple other research centers and industrial businesses that provide exciting career opportunities in biomedical informatics. For example, Indiana is well-known for its large healthcare exchanges, including Indiana Health Information Exchange (IHIE) and Michiana Health Info Network (MHIN).

The Department of BioHealth Informatics (BHI) is in the Indiana University School of Informatics and Computing (SoIC) - Indianapolis, which is the first completely new school in the United States devoted exclusively to Informatics and a range of its subdisciplines. At IUPUI, the School has strong ties with the health and life sciences. BHI intrinsically has all programs in the interdisciplinary fields. The mission of BHI is thrived to become the catalyst for excellence in education, research, community engagement, and workforce development in precision medicine, health information technology, and management. It is the home to a dynamic and interdisciplinary group of faculty and students in Bioinformatics, Health Informatics, Biomedical Informatics (BMI), and Health Information Management (HIM) programs. Table 1 listed our programs and degrees offered in the department.

Table 1: The programs and degrees grid in the BioHealth Informatics Department.

Degrees /Programs	Bioinformatics	Health Informatics	Biomedical Informatics	Health Information Management
Ph.D.	x	x		
M.S.	x	x		
B.S.			x	x
Ph.D. Minor	x	x		
Certificate	x	x		x
Accelerated 5-year B.S. + M.S.	x	x	x	x

The ever-increasing complexity of biomedical informatics requires intense collaboration and partnership to achieve faculty and student research success and industrial experience. This proposal will discuss how the department has leveraged the precious resources in the surrounding communities and partner institutes to promote the interdisciplinary research and student education in the ever-changing field of biomedical informatics.

2. Overall BHI Program Features:

For all our program, we are driving to provide our students with the following:

(1) Rigorous curricula: Students are expecting to learn different essential informatics skills in the corresponding life science and healthcare fields, to apply to analyze big data in the areas, use in pioneering research, and extend in the industry challenges.

(2) Cutting-edge research opportunities: From day 1 on entering the programs, the students will work closely with world-renown professors in multidisciplinary research, such as projects in data science, big data analytics, drug discovery, genomics, proteomics, Electronic Medical Records, Medicaid data, health information exchange, mobile health applications, and other HIT.

(3) Extensive industrial experiences: Students are provided with expanded opportunities for internship, sponsorship and collaborative research through industry connections with bioscience research institutes, healthcare organizations, biopharmaceutical partners, and biotechnology companies.

(4) Scholarship and tuition benefit: Motivated students with good academic standing will have a fellowship as tuition benefit. Additional student assistant and work-study opportunities are available to students to work as teaching or research assistants.

(5) Promising careers with a highly demanded market: Our graduates will master both the hardcore informatics skills in life science and soft skills for professional workspace. The job placement rate for our students is >99% within three months after graduation.

3. Faculty Research Requirements:

BHI enjoys close collaborations with other researchers in the IUPUI campus and other nearby campuses, and in the nearby research institutions, service communities, and industrial partners in bioscience research and healthcare information technologies. The faculty in the department conduct groundbreaking, externally-funded research in the areas of bioinformatics, system biology, computational biology, omics technology, clinical and health informatics, systems interventions, and community health research. All our research track faculty are expected to be responsible for the following three areas regarding in research and student mentoring.

- To have or to develop an independently funded research program: All research faculty must demonstrate an outstanding scholarly record of research, exhibited by high-impact peer-reviewed publications, and a vigorous research agenda that will secure competitive, external funding.

- To participate in undergraduate and graduate mentoring: The strong faculty will have demonstrated expertise to contribute to the educational mission of the BHI degree programs. Many faculty members are expert in active learning strategies and have successfully integrated teaching with research.
- To serve for many health and biomedical informatics research initiatives: All faculty members are expected to be engaged in expanding the department research scopes, and form a cross-disciplinary team to develop multidisciplinary research projects and training programs in the health and life sciences.

4. BHI Departmental Strategic Plan to promote collaborations:

The BHI faculty have worked a strategic plan to commit our department to high-quality education, student success, research excellence, and community partnerships that create superior professionals in the disciplines of biomedical sciences and technologies in healthcare. Table 2 outline the five strategic areas and major tasks to implement the plan. Each task will have its own goal and action items with expected outcome within one year, three years, and five years, respectively. This strategic plan is used as a guide for our faculty research, teaching, and service, with students as the center of all the activities.

Table 2: The BHI Strategic areas and major tasks.

Strategic Area 1: Research, Innovation and Entrepreneurship	
Task 1.1	Increase external grant funding to support faculty and graduate students.
Task 1.2	Develop research centers of excellence.
Task 1.3	Encourage high quality publications and visibility of faculty research scholarship.
Task 1.4	Pursue research commercialization and entrepreneurship.
Task 1.5	Establish productive internal and external collaborations
Strategic Area 2: Undergraduate Programs	
Task 2.1	Increase undergraduate application and enrollment and improve student quality.
Task 2.2	Improve the quality of experiential learning and integrate research, development, entrepreneurship and innovation.
Task 2.3	Maximize retention and graduation.
Task 2.4	Create new undergraduate degree, minors and certificate programs
Task 2.5	Develop new basic courses for Idew program.
Strategic Area 3: Graduate Programs	
Task 3.1	Recruitment and retention successful academia (researchers and teachers)
Task 3.2	Increase the applications and enrollment in bioinformatics and health informatics graduate programs
Task 3.3	Certificate programs in BioHealth Informatics
Task 3.4	Health Informatics: CAHIIM accreditation - November 2016.
Strategic Area 4: Teaching and Learning	
Task 4.1	Teaching quality.
Task 4.2	Teaching collaboration.
Task 4.3	Scholarship of teaching.
Strategic Area 5: Civic Engagement, Service, and Diversity	
Task 5.1	Impact the community, nation and globe through civically engaged research, service and community outreach.
Task 5.2	Build strong collaborations with Indiana Healthcare industry
Task 5.3	Build advisory boards for the departments and specific programs

5. Sample Collaborative Activities to Promote Partnership

We have initiated several activities to promote productive internal and external collaborations. Internally, we have created opportunities to foster constructive dialogue among faculty and students. One example is to form the bioinformatics student club, entirely led by students. They have created many activities, such as the light-up sections to learn from each other, the game night to have fun, the picnic to enjoy the local attractions, and social events to share the different cultures. We also invited industrial collaborators as guests for the student club events.

For external collaborations, we have first improved policies and practices to promote partnerships, such as adjunct (courtesy) appointments for external collaborators to recognize their contributions to our research and student training. We formed the departmental seminar series to identify areas of collaborations between our faculty and communities. We also appreciate the collaborative effort in the annual faculty review and promotion procedures to encourage team efforts.

Another initiative is to form program specific advisory boards. It helps us to obtain feedback from professional partners. The boards provides suggestions on curricula and training so that the programs are meeting the demands of the education, industry, profession, and job markets. It also helps to meet the program accreditation standards. We have formed our advisory board members with a diverse background and started regular bi-annual meetings. We also prioritize and implement the advice from the board meetings. Currently, we are working to make the advisory board meeting an integral part of the department to promote and help the growth of the department.

5. Example Outcomes

We have built strong partnerships with the local communities and industrial partners, such as with Eli Lilly, Dow AgroSciences, Roche Diagnosis, Indiana Bioscience Research Institute, and many others. For instance, there are strong collaborations with the Regenstrief Institute, a pioneering institution in healthcare information technologies. There are also collaborative projects with the VA Center for Health Information and Communication (CHIC), Indiana University Health (one of the largest healthcare organizations in the Midwest), Indiana Primary Health Care Association, and Indiana State Department of Health.

These partnerships are valuable resources for faculty research. All our current research-oriented faculty members have external funding supports on collaborative research projects. Our faculty has grant supports from the National Institutes of Health (NIH), the National Science Foundation (NSF), the Patient-Centered Outcomes Research Institute (PCORI), the Agency for Healthcare Research and Quality (AHRQ), Juvenile Diabetes Research Foundation (JDRF), and many other research labs and foundations.

The collaboration also improves the student research and learning experience. One example is the Lilly–School of Informatics and Computing - IUPUI Graduate Program (LGRAD) for all the BHI programs. It provides new opportunities for BHI graduate training built around graduate student research co-mentored by an advisor from BHI and a sponsor/mentor from Lilly Research Laboratories. The LGRAD program creates a well-designed pathway for Lilly employees to obtain an advanced degree in one of the existing graduate programs at BHI. It also inspires collaborative relationships that may enhance the progress and success of Lilly employee graduate student to advance degree program with sound and publishable thesis work.

BHI is working on similar MOU with other local communities and industrial partners. One new such MOU is with the Indiana Bioscience Research Institute (IBRI) for collaboration faculty research and student project experience. We are expecting such MOU with a few other organizations. These MOUs will accelerate innovation research. It also will promote research commercialization and develop entrepreneurial skills among faculty and students to the broader societal impact of the translational research.

6. Conclusion

The Department of BioHealth Informatics is uniquely positioned to foster strong collaboration and partnership among academic units, local communities, and commercial industries. The collaborations promote the faculty research and student professional experiences in the broad field of biomedical informatics. BHI has constructed many strong collaborations. We foresee future partnerships for our students and faculty.