HEALTH
UNIVERSITY OF UTAH

Department of Biomedical Informatics

2019 Highlights

LETTER FROM THE INTERIM CHAIR

It has been six months since Dr. Good offered me the position of the interim chair. People ask me if I am 'doing OK" every day. I want you all to know that I am doing well and that so far I have enjoyed my new role. Leadership is very different from science, so I have been on a steep learning curve, but I have had a lot of help in the journey. I want to thank everyone who is taking time out of their day to provide me with support. The department has an excellent Executive Committee - Ken, Guilherme, and Julio. We meet weekly to discuss department issues and four minds are definitely better than one. I am a regular over at Faculty Affairs, and the Dean of Finance Office. I have a new appreciation for HR. The other chairs are very supportive and we meet often. Our Friday morning meetings are useful and our monthly dinners are a mixture of work and fun. The DBMI administrative staff see a lot of me. They are a fabulous team and I rely on every member. They get things done. I am also getting advice from an old friend of the department. Andrew Balas, an alumn (now at Augusta University), calls me once a month and helps me think through problems and suggests new ways to do things. I have made a new friend. I am very grateful for all the support I receive.

We have done a lot together in the past six months. We have a new cohort of students. Our admissions committee did a fantastic job last year as we have a bright and hardworking crop. The new intake has learned to program this semester on top of the other academic classes. They have thrown themselves into DBMI life. For example, Alex Au, a first-year MS student presented to our IAB in September.

Karen Eilbeck, PhD

We found instructors for classes and have developed new content. We have engaged new faculty to teach and mentor. I am thrilled that our CMIO, Maia Hightower will be co-teaching our Healthcare Informatics course in the Spring with Joe Dalto. We are sending out students across the School of Medicine to undertake informatics projects. For example, we have students working for Vikrant Deshmukh and his EDW team. We have placed a student in the division of Immunology with Tracey Lamb. We have a bigger demand for our students than we can keep up with, and that is a good place to be.

We just got back from AMIA in Washington DC where our department was well represented. We had 33 talks and posters. Our team was up at the crack of dawn in breakfast working groups and was solidly present all day. We had a booth manned by an enthusiastic team (Robert, Cathy, faculty and both current and past students), to recruit students and postdocs, and had a continual stream of people visit. Our Alumni dinner brought in people from across the country and across time. It was great to catch up with old friends and make new ones.

I look forward to working with the department in 2020. I hope we can all move forward into the new year with the same collaborative passion we brought to 2019.

RESEARCH

Our research portfolio covers a broad range of domains and applications including clinical decision support (CDS), population health management, natural language processing, bioinformatics, and translational research informatics. In 2019, we continued to build on last year's success, sustaining a portfolio of nine Federal center grants and adding two new grants from the Agency for Healthcare Research and Quality (AHRQ).

NEW GRANTS

- AHRQ U18 – EHR-integrated lung cancer shared decision making (Kensaku Kawamoto, PI; Weir, Del Fiol, co-PIs). In collaboration with Population Health Sciences (Angie Fagerlin) and University of Michigan (Tanner), the project aims to investigate the effect of a SMART on FHIR app on shared decision making for lung cancer screening. The app is being deployed within Epic® at UHealth community clinics.
- AHRQ U18 – EHR-integrated shared decision making to reduce harm from drug interactions (Dan Malone, PI; Del Fiol, Kawamoto, and Weir, co-Is). In collaboration with the College of Pharmacy (Dan Malone) and University of Pittsburg (Richard Boyce, co-I), the project aims to design and evaluate a shared-decision making app for potential drug-drug interactions using emerging health IT standards such as SMART on FHIR, CDS Hooks, and Clinical Quality Language (CQL).
- NIDA R03 (Michael Conway, PI) Investigating the documentation of E-Cigarette use in the VA EHR. Focused on the use of Natural Language Processing to extract mentions of electronic cigarette use from the Veterans Association Electronic Health Record.
- NIA R03 (Younghee Lee, PI) Integration Analysis of Alternative Splicing in Alzheimer's Disease. The focus is targeting alternative splicing by integrating multi-omics and AD-related endophenotype data to identify new therapeutic targets and diagnostics
- Huntsman Cancer Institute Seed grant (Younghee Lee, PI) Develop a splicing decision model to identify functionally actionable cancer-specific somatic and rare germline variants.

Guilherme Del Fiol, MD, PhD
Vice-Chair, Research

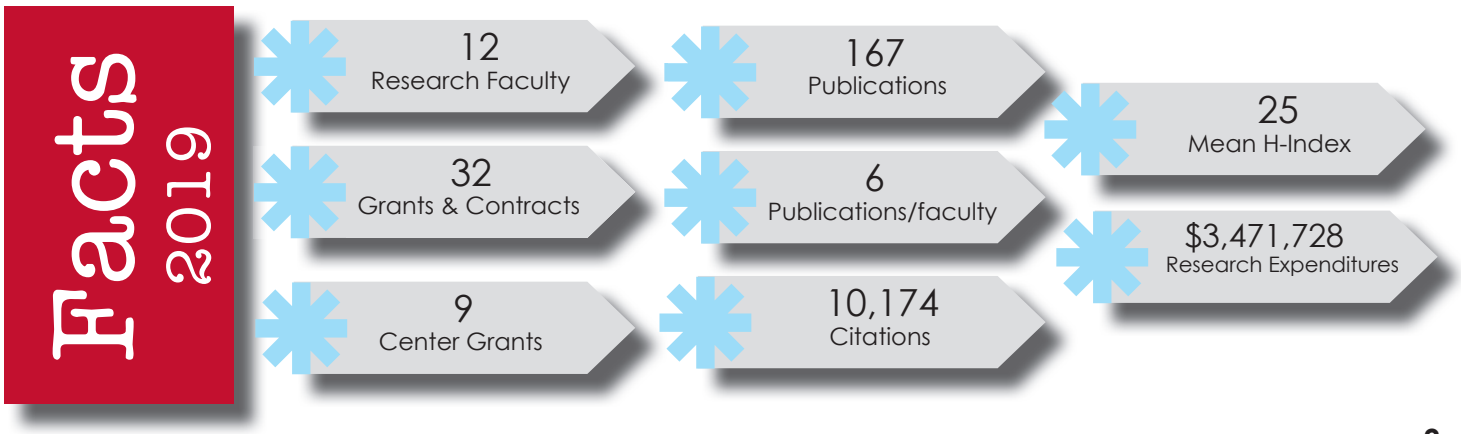
CURRENT GRANTS

- PCORI QuitSmart Utah in collaboration with the Huntsman Cancer Institute (David Wetter, PI; Del Fiol, Gibson, Weir, and Kawamoto, co-Is). Through a randomized controlled trial, the study is assessing the effect of CDS interventions for tobacco cessation in federally qualified health centers that provide care for underserved communities throughout Utah.
- U24 NCI (Guilherme Del Fiol and Ken Kawamoto, co-PIs) focused on population-based CDS to identify patients who meet guideline-based criteria for genetic evaluation of breast and colorectal cancer risk based on family history documentation in the EHR. Collaborators include DBMI (Charlene Weir), Huntsman Cancer Institute (Josh Schiffman, Wendy Kohlmann), Internal Medicine (Rachel Hess, Michael Flynn), and Intermountain (Scott Narus).
- U01 NCI in collaboration with the Huntsman Cancer Institute (Kim Kaphingst & Saundra Buys, co-PIs; Ken Kawamoto and Guilherme Del Fiol, co-Is). In a multi-site randomized controlled trial

Research, continued

(University of Utah and NYU), the study is investigating a novel approach using interactive chatbot technology to outreach patients who meet guideline-based criteria for genetic evaluation of breast and colorectal cancer. The study leverages infrastructure enabled by the NCI U24 grant above led by PIs Del Fiol and Kawamoto.

- HITECH center grant with Pediatrics (Chuck Norlin and Guilherme Del Fiol, co-PIs; Borbolla, Kawamoto and Weir, co-Is) aimed at developing tools and resources for care coordination of children with special healthcare needs. The project includes collaborators from DBMI (Damian Borbolla, Charlene Weir, Ken Kawamoto), Intermountain (Scott Narus, Sid Thornton), Utah Health Information Network (Matt Hoffmann), and Medicaid.
- University of Utah CCTS (Julio Facelli, Bernie LaSalle and Ram Gouripeddi, co-Is). A large focus of the Department in the last 10 years has been on providing informatics support to clinical translational research and conducting research on translational informatics. We play a central role in all four arms of the CCTS.
- NIBIB center grant (Julio Facelli and Kathy Sward, co-PIs) aimed at enabling a standard-based, open access architecture that integrates sensor and clinical data to support longitudinal studies on asthma symptoms, treatment, and outcomes. The PRISMS Informatics Center is in its third year of funding and this year will demonstrate end-to-end capabilities using both advanced and commercial sensors.
- NIDA R21 (Michael Conway, PI) focused on using social media and natural language processing to map user trajectories between marijuana, tobacco, and electronic cigarettes.
- NHGRI center grant awarded to UNC Chapel Hill, Geisinger, ACMG, Kaiser Permanente, and the University of Utah (Jonathan Berg, PI; Karen Eilbeck, sub PI). ClinGen aims to build an authoritative resource that defines the clinical relevance of genes and variants for use in precision medicine and research. The DBMI sub award focuses on providing tools and curation to integrate clinical and genomic knowledge for the ClinGen Resource with EHR systems.
- NCATS center grant with Northwestern (Justin Starren, PI; Julio Facelli, site PI) and eight other CTSA sites to enable software tools that will allow all CTSA sites to integrate patient-reported outcomes tools into their EHRs using the SMART on FHIR standard.
- NCATS center grant with Vanderbilt (Paul Harris, PI; Bernie LaSalle, site PI; Julio Facelli and Guilherme Del Fiol, co-Is) to develop a Recruitment Innovation Center (RIC) focused on methods and resources to improve clinical trial education, recruitment, and enrollment.
- University of Utah Seed grant (Groat/Facelli, Gouripeddi, PIs) Driving out Diabetes Initiative: Diabetes & Metabolism Research Center at the University of



Utah, the England Family Foundation, the Ardene Bullard "Of Love" Tennis Tournament, Jacobsen Construction: to detect and characterize impaired awareness of hypoglycemia using machine learning and non-invasive sensors in type 1 diabetes.

- University of Utah BMI Founder's Fund (Groat PI, Gouripeddi/Facelli Mentors): Development and evaluation of machine learning methods to characterize impaired awareness of hypoglycemia.
- Juvenile Diabetes Research Foundation (JDRF) and Tidepool Early Stage Investigator award (Groat/Gouripeddi/Facelli): Development and evaluation of machine learning methods to characterize impaired awareness of hypoglycemia.
- HITACHI (Kawamoto, PI) Clinical Decision Support System (CDSS) to Optimize Disease Management. The objective of this project is to (i) finalize development of an EHR-integrated diabetes management dashboard that leverages standards-based interoperability frameworks including OpenCDS and SMART on FHIR and to (ii) conduct a clinic-randomized controlled trial to evaluate the system's impact on patient care.
- AHRQ RTI (Kawamoto, PI) Patient-Centered Outcomes Research Clinical Decision Support Learning Network.
- R01 NHGRI (Eilbeck, PI) Community Driven Framework for Genome Based Clinical Diagnostics. This grant provides novel algorithms to define sequence variants and by developing file formats and software to communicate this information, using guidance from the clinical diagnostic community.
- T32 NIDDK (Eilbeck, Fisher, PIs) Interdisciplinary Training Program in Computational Approaches in Diabetes and Metabolism Research. The focus is to provide students with funding for stipend, travel, insurance and training related expenditures to further their training programs.
- T15 NLM (Eilbeck, PI) Biomedical Informatics Training Grant. The focus is to provide students with funding for stipend, travel, insurance and training related expenditures to further their training programs.
- T15 Supplement (Eilbeck, PI) Biomedical Informatics Training Grant Supplement.
- T15 SPUR Supplement (Eilbeck, Facelli, PIs). Biomedical Informatics Training Grant Supplement –SPUR.
- ECHO Supplement (Facelli, site PI) Utah Center for Clinical and Translational Science UL1 Supplement. National Institute Center for Advancing Translational Science.
- Seattle Children's Hospital Sub (Thorell, Gouripeddi, Site PIs) Prevention of Cerebrospinal Fluid Shunt Infections. Funded by NIH/NINDS.
- Helping End Addition Longterm (HEAL) initiative Pain Management Effectiveness Research Network (HEAL-ERN), supplement to the Trial Innovation Network (Dean PI); informatics focus is data harmonization across HEAL initiatives NIH-wide. (Informatics team is Sward co-I; Gouripeddi, Guo, Staes collaborators).
- Dartmouth Subcontract (Gouripeddi, PI) Information Extraction from EHR to Predict Readmission Following Acute Myocardial Infarction. The focus of this project is to combine clinical notes with structured data to quantify the risk for readmission.
- Aspire (LaSalle, PI) Funding from the State of Utah.
- R43 subcontract (Weir, site PI) Less is More: Context-Relevant Views of EHRs. Funding by NIH/ELIMU Therapeutics. The focus is to develop technology to create context-relevant views of EHRs for hospitalists.
- R01 eMAR (Weir, Site PI) Improving Patient Safety and Clinical Cogntive Support through eMAR Redesign. Funding by NIH/AHRQ

EDUCATION

MS Students

We are impressed with the quality and breadth of our professional Masters' cohort this year. We have students applying their informatics skills across a diverse set of projects. The students are actively engaged in guiding their own educational path. Jared, for example, is working in an immunology lab, driving the analysis of the single-cell RNA-seq experiments that the group performed. Joni, a second-year student spent the summer in the UK, working on her capstone at Kings College, London. She helped develop workflows for researchers interested in using a psychiatry database. Our students are building collaborative bridges that strengthen our department. We look forward to seeing where the next crop of students will lead us and hope to build upon the connections they have forged.

PhD Students

Our Ph.D. students had a strong showing at the NLM training grant conference this year. As an educator, it is gratifying to see our students blossom over the course of their PhD training. Janette gave a plenary session talk, Andrew and Diane presented focus talks, Rolando and Amber presented posters and Michael and Tom did open mic sessions. We enjoyed our time in Indianapolis and even visited the Lucas Oil Stadium - home of the Colts.

Student Highlight

Michael Watkins

Michael Watkins joined us from the BYU Bioinformatics Undergrad Program. He has just entered into the third year in DBMI and making a reputation for himself in the world of informatics. He presented a paper at AMIA in November about his work implementing the GA4GH VR standard - an unambiguous method to share genomic variant data. He has had another paper accepted for the upcoming AMIA translational bioinformatics meeting in March where he will discuss his work relating to FHIR. He is also working on a side project with an eMERGE group on infobuttons, and this fall he twice went to Peru with Damian Borbolla to teach a workshop on the FHIR standard. Michael is working hard and taking every opportunity to learn new things and to travel.

DBMI BY THE NUMBERS

Current MS Students

45 (non-thesis)

8 (online-thesis)

6 (Asia Campus)

Current PhD Students

20 PhD

4 PostDoc

2019 Graduates

18 MS

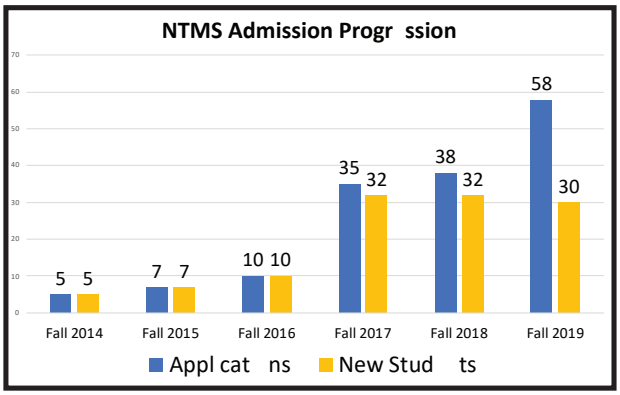
Alumni

456

Education, continued

The master program keeps growing. We received 58 applications and accepted 30 students last fall. Eight students started the new Online Master program.

Karen Eilbeck and Damian Borbolla finished the certificate program in Education Scholarship, offered by the Academy of Health Science Educators. The final project was presented at the AMIA Education Meeting in St. Louis last June. The title of the presentation was "When to lump and when to split: Understanding academic and professional student expectation and motivation".



We signed an agreement with the David Eccles School of Business at the U. Students enrolled in our DBMI NTMS program can obtain an MS in Biomedical Informatics with a certificate in Business Analytics from the School of Business and vice-versa. Two students from the Information System (MSIS) program have started this journey this Spring of 2020. Also, an agreement was implemented this year with the MHA program. MHA faculty developed a Healthcare Leadership class for DBMI students, MHA students are taking Foundations of Healthcare Informatics class from BMI, taugh by Dr. Maia Hightower, UHealth CMIO, an adjunct faculty in our department.

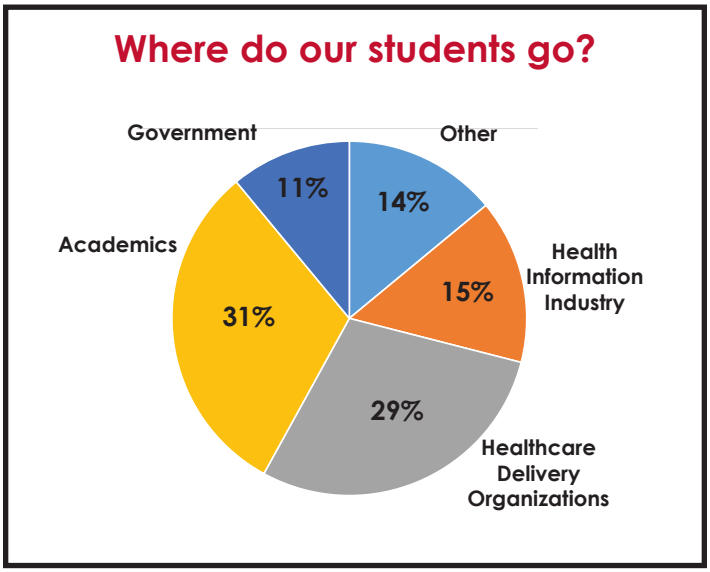
Incorporation of active learning opportunities. We increased the number of internal practicum options. John Hurdle, Mike Conway together with Brian Bucher will be offering a hands-on course named: "Applied Health Data Science Practicum" (formerly known as the Data Science Scholars). Three research labs from biology and computer genetics agreed to accept DBMI students interested in Bioinformatics. And the FHIR practicum is still offered for those students with an interest in Applied Health Informatics.

Global Impact. Last October and November, instructors from the FHIR practicum together with two students traveled to Peru to teach principles of interoperability and FHIR. This was part of a WHO/PAHO grant.

Biomedical Data Science. We are making progress in this area too: Damian joined the new University of Utah Center for Data Science. This initiative will be the organizational unit for research and service events. Samir Abdelrahman is leading the Data Science track and he's been leading collaboration opportunities with CS to incorporate topics like AI ethics and Deep Learning in our program.

School of Medicine. Karen and Damian now core educators for the Biomedical Informatics domain. Five DBMI faculty (Karen, Julio, Bernie, Ram and Damian) facilitate Case-based learning sessions for medical students and Karen is the co-director of Host & Defense.

Damian Borbolla has been appointed as the new Curriculum Committee Chair. Members of the committee are: Ram, Kathy, Charlene, Samir and Karen. In addition, Damian is now the Director of the Master's Program. This includes the online and on-campus courses, collaborations with the U's Business School, Salt Lake County Health Department and others. This is quite a challenge but he has made great strides in making significant improvements and dealing with the frequent issues that go along with a new program. He is doing a great job!



INDUSTRY

IABtalks

The DBMI Industry Advisory Board (IAB) hosts two IABtalks events each year in April and October.

Attendance for these events continue to exceed expectations, with excellent representation from local informatics industry, students and faculty.

In April, the evening was kicked off with the student "lightning" presentations by Janette Vazquez, and Ryzen Benson, both PhD candidates. As a sponsor, Health Catalyst asked their Sr. VP and General Manager of Application Suite Business, Eric Just, to present "Digital Phenotyping".

In October, Alexander Au, MD a Masters student, and Ram Siripuram, a PhD candidate, gave their "lightning" presentations. Intermountain Healthcare was the main sponsor with Drs. Peter Haug and Stanley Huff presenting "Intermountain Healthcare's Center for Standards-Based Healthcare Interoperability". Once again, these presentations are both timely and fascinating.

Future of the IAB

One of the department's goals in 2019 was to grow our IAB from the original seven Steering Committee member companies. We more than doubled the number of member companies. It was a very busy time for our leadership team!

The 1st Annual Strategic Planning Retreat was held in September and drew representatives from 13 companies. It was productive and informative to the department's leadership as we gained industry perspective on important issues and trends in biomedical informatics and gained insights into industry needs and thereby increasing the marketability of the department's programs.

We are excited to grow these relationships and take our department to new heights.

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Clinical Architecture STRATAMETRICS VSchool

CLINICAL OPERATIONS

The Department has continued to lead the nation in innovative approaches to optimizing the EHR through its ReImagine EHR initiative. Led by Dr. Ken Kawamoto and others including Dr. Guilherme Del Fiol and Dr. Charlene Weir, the ReImagine EHR initiative has now implemented over 10 standards-based, EHR-integrated solutions into University of Utah Health's clinical care environment. Notable recognition and achievement in the clinical informatics realm over the past year include the following:

- Recognition of ReImagine EHR initiative by Modern Healthcare, with Dr. Kawamoto named a ***Top 25 Innovator of 2019*** for this work.
- 1st place recognition of the ReImagine EHR Bilirubin App in the AMIA/HL7 FHIR® Applications Showcase at the AMIA 2019 Annual Meeting.
- Publication of one of the first manuscripts demonstrating the promise of well-designed EHR add-on apps, for the Bilirubin App and its impact on patients and providers.
- Endorsement by U.S. Health IT Advisory Committee of the recommendations of the Interoperability Standards Priorities Task Force, co-chaired by Dr. Kawamoto.
- Deployment of an EHR-integrated Disease Manager application that provides a 1-stop shop for chronic disease management, with current support for hypertension, diabetes, chronic obstructive pulmonary disease, and health maintenance.
- Continued success in securing grants enabled by the ReImagine EHR initiative, including an AHRQ R18 grant on EHR-integrated lung cancer shared decision making (PI: Kawamoto) and an AHRQ U18 grant on EHR-integrated shared decision making to reduce harm from drug interactions (PI: Malone)
- Multitude of peer-reviewed and invited presentations on ReImagine EHR, including at the Association of American Medical Colleges annual meeting, Mayo Clinic Center for Individualized Medicine Grand Rounds, AMIA Informatics Summit (Clinical Research Informatics Best Paper Award), and the AMIA Annual Meeting (>10 presentations including 1 workshop, 2 demos, 2 entries in the FHIR Applications Showcase, and 3 panels).

Kensaku Kawamoto, MD PhD, MHS
Vice-Chair, Clinical Operations

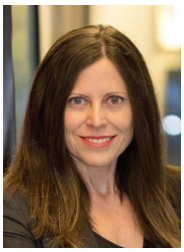
FACULTY AWARDS AND HONORS

DAMIAN BORBOLLA, MD, MS

Dr. Borbolla's seed grant proposal to the WHO/PAHO Pan America Health Organization was one of only 35 winners out of more than 200 submissions. His proposal, "Standards-based Web Application to survey social determinants of health in Peru" was developed in collaboration with the Ministry of Health in Peru. This is a unique opportunity to start building relationships with the Ministry of Health and academic centers in Peru and Latin America.

MIKE CONWAY, PHD

Dr. Conway coauthored a paper that has been selected as one of the three best informatics papers of 2018 in the "Consumer Health Informatics and Education" subfield of medical Informatics by the IMIA Yearbook of Medical Informatics. This paper, *Examining Thematic Similarity, Difference, and Membership in Three Online Mental Health Communities from Reddit: A Text Mining and Visualization Approach*, was published in Computers in Human Behavior.

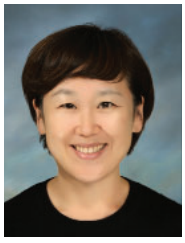


MOLLIE CUMMINS, PHD, RNAMIA, FAAN, FACMI

The University of Utah and the Huntsman Foundation announced in July six additional presidential faculty chairs. Mollie Cummins, a Professor and Associate Dean for Research and the PhD Program in the College of Nursing, and an Adjunct Associate Professor in our department, was one of six recipients of this prestigious award. The faculty members selected have demonstrated excellence in research, clinical care and career progression.

R. SCOTT EVANS, MS, PHD, FACMI

Intermountain Research and Medical Foundation's Heart and Lung Advisory Council honored Dr. Evans with the Scientific Award at their annual Legacy of Life event for his over 35 years of research in the field of biomedical informatics. His work has had a tremendous influence on hundreds of patient lives by decreasing length of stay, adverse events and saving lives.



YOUNGHEE LEE, PHD

Dr. Lee was awarded funding from the National Institute on Aging (NIA) for her grant, "Integrative analysis of alternative splicing in Alzheimer's disease". Dr. Lee was also awarded funding from the Cancer Control and Population Sciences (CCPS) Program, and the Huntsman Cancer Institute to support her researh project "Develop a splicing decision model to identify functionally actionable cancer-specific somatic and rare germline variants."

KATHY SWARD, PHD, RN

Dr. Sward was named one of four Presidential Scholars at the University of Utah, an award that honors extraordinary research and academic efforts of early to mid-career faculty. The award provides talented faculty with financial backing to support their scholarly, teaching and/or research intiatives.

STUDENT SCHOLARSHIPS, AWARDS & HONORS

RICHARD A. FAY & CAROL M. FAY FELLOWSHIP

The Richard A. Fay and Carol M. Fay Endowed Graduate Fellowship was established by Mr. and Mrs. Richard A. Fay in memory of Homer Warner, MD, PhD. The expendable funds are to be administered by the department chair, and are designated to support graduate students' training, and this year, we were able to provide seven fellowships. The recipients are:

J. Fredo Louis

Andrew Miller

Diane Walker

Janette Vazquez

Amber Kiser

Rolando Hernandez

Michael Watkins

JDRF-sponsored Tidepool Early Career Development Award

Danielle Groat

Danielle Groat, a DBMI Postdoc, was selected as an award recipient to help support her research in diabetes: "Clustering of Glucose Curves: A Preliminary Analysis to Inform the Model Development of Assessing Impaired Awareness of Hypoglycemia". Congratulations!

UNITED NATION'S 68TH CIVIL SOCIETY CONFERENCE

Dr. Alexander Au, a DBMI masters student, developed a global mental health app that he presented at the United Nation's 68th Civil Society Conference in Salt Lake City in August. He was then asked to speak at the U.N. headquarters in New York City on World Mental Health Day. The aim of the app is to "not only diagnose and manage mental health but improve methods to better understand suicide". Dr. Au is a great ambassador for our department!

Alexander Au

SYMPOSIUM AWARDS

HL7 FHIR Applications Showcase Winner:
Polina Kukhareva

BiliApp: a SMART on FHIR App for Neonatal Bilirubin Management
Polina Kukhareva, PhD, MPH, MS, Phillip Warner, MS, Salvador Rodriguez, PhD, David Shields, BA, Julie H. Shakib, DO, MS, MPH, Carole H. Stipelman, MD, MPH, Kensaku Kawamoto, MD, PhD, MHS

HL7 FHIR Applications Showcase Finalist:
Teresa Taft

Pediatric Patient Summary SMART On FHIR App: Supporting Care Planning and Coordination for Chidlren and Youth with Special Health Care Needs
Teresa Taft, Guilherme Del Fiol, Damian A. Borbolla, Ryan Cornia, Kensaku Kawamoto, Charlene Weir, Scott P. Narus, Mindy Tueller, David E. Shields, Andrew Iskander, Philip Warner, Chuck Norlin

SYMPOSIUM PRESENTATIONS

Our Department's students, alumni, and faculty had a very strong showing in almost all presentation categories.

Implementation of Real-time Electronic Clinical Decision Support for Emergency Department Patients with Pneumonia Across a Healthcare System
N. Dean, Intermountain Medical Center, University of Utah; C. Vines, J. Rubin, Intermountain Medical Center; D. Collingridge, R. Srivastava, K. Kuttle, B. Webb, Intermountain Healthcare; M. Mankivsky, Cerner Corporation; B. Jones, University of Utah; M. Walker, Utah Valley Regional Medical Center; N. Jenson, Southwest Emergency Physicians; T. Allen, Intermountain Healthcare Delivery Institute, Intermountain Medical Center; P. Haug, Intermountain Healthcare and the University of Utah

QUICK: A FHIR Logical Model for Clinical Decision Support and Clinical Quality Measurement
C. Nanjo, G. Del Fiol, D. Martin, R. Bradshaw, University of Utah; B. Rhodes, Dynamic Content Group; F. Eisenberg, iParsimony; K. Kawamoto, University of Utah

One-way and Round-trip Analysis Demonstrates Surprising Limitations of Standards-based Terminology Maps
S. Brown, Department of Veterans Affairs /

Vanderbilt University Medical Center; L. Stevenson, Department of Veterans Affairs; D. Territo, J. Killbourne, H. Miller, Department of Veterans Affairs; J. Nebeker, University of Utah; M. Lincoln, Department of Veterans Affairs/University of Utah

Building Safer EHRs: Hospital Medication Order Safety Performance
A. Holmgren, Harvard University/Brigham & Women's Hospital; Z. Co, L. Newmark, Brigham & Women's Hospital; M. Danforth, The Leapfrog Group; D. Classen, University of Utah Health Science Center; D. Bates, Brigham & Women's Hospital

Determination of Marital Status of Patients from Structured and Unstructured Electronic Healthcare Data
B. Bucher, J. Shi, R. Pettit, University of Utah School of Medicine; J. Ferraro, Intermountain Healthcare; W. Chapman, University of Utah School of Medicine; A. Gundlapalli, University of Utah School of Medicine/VA Salt Lake City Healthcare System

YouTube Video Analytics for Patient Self-care of Chronic Diseases
X. Liu, University of Utah; B. Zhang, University of Arizona; A. Susarla, Michigan State University; R. Padman, Carnegie Mellon University

2018 Salary Survey of AMIA Members: Factors Associated with Higher Salaries
Y. Cheng, George Washington University; A. Mohanty, University of Utah; O. Ogunyemi, University of California Los Angeles; C. Smith, University of Wisconsin; G. Leroy, University of Arizona; Q. Zeng, George Washington University

Balancing Functionality Versus Portability for SMART on FHIR Applications: Case Study for a Neonatal Bilirubin Management Application
P. Kukhareva, P. Warner, S. Rodriguez-Loya, H. Kramer, C. Weir, C. Nanjo, D. Shields, K. Kawamoto, University of Utah

Implementing the VMC Specification to Reduce Ambiguity in Genomic Variant Representation
M. Watkins, S. Rynearson, A. Henrie, K. Eilbeck, University of Utah

Using Natural Language Processing to Improve EHR Structured Data-based Surgical Site Infection Surveillance
J. Shi, S. Liu, L. Pruitt, C. Luppens, University of Utah; J. Ferraro, Intermountain Healthcare/ University of Utah; A. Gundlapalli, University of Utah/VA Salt Lake City Healthcare System; W. Chapman, B. Bucher, University of Utah

Barriers, Facilitators, and Potential Solutions to Advancing Interoperable Clinical Decision Support: Multi-stakeholder Consensus Recommendations for the Opioid Use Case
L. Marcial, B. Blumenfeld, RTI International; C. Harle, Regenstrief Institute; X. Jing, Ohio University; M. Keller, Cedars-Sinai Medical Center; V. Lee, Clinical Architecture; Z. Lin, Zhen Research; A. Dover, First Databank, Inc.; A. Midboe, VA Palo Alto Health Care System/Stanford University; S. Al-Showk, E. Lomotan, AHRQ; V. Bradley, Bradley HIT Consulting; J. Breen, First Databank, Inc.; M. Fadden, Cerner Corporation; L. Marco-Ruiz, Norwegian Centre for E-Health Research; R. Mohamed, First Databank, Inc.; P. O'Connor, Health Partners Institute; D. Rosendale, Deloitte Consulting; H. Solomon, Retired; K. Kawamoto, University of Utah

Health Information Technology Standards for Implementing and Using Clinical Decision Support: Latest Developments and What You Need to Know
G. Del Fiol, University of Utah; P. Haug, Intermountain Healthcare; R. Jenders, Charles Drew University/UCLA; K. Kawamoto, University of Utah; B. Rhodes, Dynamic Content Group

QDM to QUICK – Mapping the Future
F. Eisenberg, Parsimony LLC; J. Kunisch, Memorial Hermann Health System; K. Lesh, Battelle; C. Nanjo, University of Utah; J. Rubini, Mathematica Policy Research

The Path Forward: Recommendations from the U.S. Health IT Advisory Committee on Interoperability Standards Priorities and the U.S. Core Data for Interoperability
C. Caraballo, Audacious Inquiry; K. Kawamoto, University of Utah; S. Lane, Sutter Health Palo Alto Medical Foundation; T. O'Malley, Partners HealthCare System

Symposium Presentations, continued

wFHIR and CDS Hooks-Based Clinical Decision Support Platform for Population Health Management: a Use Case in Genetic Counseling for Familial Cancer Risk
R. Bradshaw, University of Utah

Thriving in Your Biomedical Informatics Career While Balancing Work, Personal, and Family Life
L. Clack, University of Georgia; W. Hersh, Oregon Health Science University; G. Jackson, IBM Watson Health; A. Mohanty, University of Utah; Q. Zeng, George Washington University

Researchers' Perspectives on Symptoms related to Cancer Pain: A Network Analysis of Literatures
J. Guo, University of Utah

Evaluating HER Data Availability for Cancer Pain Research
J. Guo, University of Utah

Extracting Disease Onset from Family History Comments in the Electronic Health Record using Fast Healthcare Interoperability Resources
J. Shi, University of Utah

Refinement of Underutilized Health Technology Tools Through Usability Studies
T. Taft, University of Utah

Continuous Predictive Modelling for Sepsis, Organ Failure, and in-hospital Mortality in the Intensive Care Unit
S. Abdelrahman, University of Utah

Data-driven Study of Pain, its Predictors, Co-morbidities, and Characteristics using Nurse-generated Big Data
Y. Kang, University of Utah

Assimilating Pollen into Exposomes for Pediatric Asthma Research
K. Sward, University of Utah

BiliApp: a SMART on FHIR App for Neonatal Bilirubin Management
P. Kukhareva, University of Utah

Pediatric Patient Summary SMART on FHIR App: Supporting Care Planning and Coordination for Children and Youth with Special Health Care Needs
T. Taft, University of Utah

Determination of Marital Status of Patients from Structured and Unstructured Electronic Healthcare Data
B. Bucher, University of Utah/Primary Children's Hospital

Evidence-Based Care Made Easy: University of Utah's SMART on FHIR Platform for Chronic Disease Management and Health Maintenance
K. Kawamoto, University of Utah

Lessons Learned Using Standards-Based Decision Support Frameworks in Commercial EHRs: Opioid Decision Support Case Study
C. Erdmann, Cerner Corporation; N. Kashyap, Yale New Haven Health; K. Kawamoto, University of Utah; B. Rhodes, Dynamic Content Group

Early Prediction for Multiple Adverse Outcomes in Acute and Chronic Back Pain Transitions
S. Abdelrahman, University Utah

Sync for Genes: Integrating Genetic Information at the Point of Care
R. Freimuth, Mayo Clinic; S. Garcia, Dept. of Health and Human Services; R. Milius; N. Ruiz-Schultz

Citizen Science: Using Informatics to Engage Vulnerable Populations in Scientific Research
G. Demiris, University of Pennsylvania; S. Iribarren, University of Washington; K. Sward, University of Utah; A. Turner, University of Washington

Toward Patient-facing Clinical Decision Support: Critical Issues and Near-term Opportunities
A. Boxwala, Elimu Informatics Inc.; J. Desroche, Meditech; B. Middleton, Apervita, Inc.; J. Richardson, RTI; K. Sward, University of Utah

DBMI ALUMNI AWARDS

Each year our alumni vote on a graduate who has made an exceptional impact in the areas we value in our department: relevance, relationships, and leadership.

R. Scott Evans, MS, PhD, FACMI, '81
Scott retired this past year as the Medical Informatics Director at Intermountain Healthcare. He is the recipient of many awards in the medical informatics field, including the Priscilla M. Mayden Award in 1993 for Outstanding Contribution in the Field of Medical Informatics, the Oslers Cloak Award for Excellence in Caring and curing at Intermountain Healthcare in 1997, the Investigator of the Year Award from Intermountain Healthcare in 2011, and the Donald A.B. Lindberg Award for Innovation in Informatics by the American Medical Informatics Association Achievement Award from Intermountain Healthcare. He served two terms on the AMIA Board of Directors with two years as Treasurer, was the Chair for the 2011 AMIA annual symposium and three years on the Institute of Medine for the prevention of adverse drug events.

Reed M. Gardner Award for Faculty Excellence

Congratulations to Julio Facelli, the recipient of wthe 2019 Reed M. Gardner Award for Faculty Excellence. This award is selected and presented by the Biomedical Informatics department students and the Nursing Informatics program each year.

GET INVOLVED

* Attend a Special Interest Group
* Join our Industry Advisory Board
* Help mentor a student
* Offer a lecture or hands-on activity in a class
* Advertise internships and jobs

For more information,
email cathy.bradley@hsc.utah.edu

John Hurdle, MD, PhD Back from Vietnam

The department welcomed home Dr. John Hurdle who returned from his six month sojourn to Vietnam as a Fulbright Scholar. Dr. Hurdle taught biomedical informatics at the University of Information Technology in Ho Chi Minh City (formerly named Saigon) on the topic of "Promoting Vietnamese Healthcare Informatics in a Computer Science Environment".

As a Fulbright Scholar lecturing in India almost 25 years ago, Dr. Hurdle and his wife, Colleen McDannell, always wanted to repeat their phenomenal experience. They felt it was the right time to apply again and agreed that they would apply to the program and, regardless of who received the award, they would both go. As luck would have it, Dr. Hurdle won the award.

Because Dr. Hurdle is of the age where serving in the Vietnam War was a very real possibility as a young man, he has always had an interest in Vietnam. With opportunities to teach in just about every country in the world, it was an easy decision for him to choose Vietnam.

One of the advantages to Dr. Hurdle's biomedical informatics expertise as he applied for the Fulbright Scholar, is that there have not been any awards in the informatics area for the past 15 years at least. He points out that we know there must be demand in almost every country (as there is in the US) so applying for a Fulbright is a great opportunity for informaticists. Dr. Hurdle encourages others to look into this amazing experience (think of it as "an all-expenses-paid trip to virtually any country in the world to teach or conduct research for 5 or 10 months). He would love to talk to you if you are interested. He promises that it will be quite the adventure!

When asked to recount an interesting observation about Vietnam, Dr. Hurdle responded that the Vietnamese observance of the Lunar New Year in February, or as they call it, the Tet Holiday, is similar to our Thanksgiving holiday. Except that the entire country literally shuts down for a week of preparation and celebration. It was a week of "creative chaos". The Tet Holiday was a wonderful way for the country to collectively stop, take a deep breath, be with family, and show respect to their ancestors.

Dr. Hurdle is pleased to be home but so grateful for the rich experiences he had on the other side of the world.

Dr. Hurdle mentioned one more interesting tidbit about Vietnam that is sure to whet your appetite if you are a coffee aficionado – Vietnam is famous for the most expensive coffee in the world ($35-80 for a single cup) – Weasel coffee. Being a bit squeamish to explain, Google it if you want to find out why it's so expensive and what makes it so smooth, earthy, and sweet. He tried Weasel coffee and decided it was "an acquired taste…"

FOUNDERS' FUND

Many thanks to all those that donated to such a worthy cause!

In 2019, we raised over $60,000 for a research endowment that will generate approximately $2,000 per year. The endowment will support one-year projects by Department of Biomedical Informatics graduate students and postdoctoral fellows in new, innovative areas related to their research.

Congratulations to the first year's recipients - Thomas Reese and Danielle Groat!

Thomas Reese, PhD

Study Objective: To determine the impact of a novel information display on diagnosing circulatory shock. This was an experimental, within-subject, study comparing two different information displays (Integrated and Conventional) with multiple patient scenarios.
Discussion: Physicians using the integrated display had improved circulatory shock diagnosis and faster information processing. Novice physicians were more likely to identify patterns of circulatory shock when the data was integrated and presented graphically.
Conclusion: These findings suggest the performance gap between experts and novices can be reduced by optimized information displays. Broadly, information displays consisting of graphical widgets may improve patient care by supporting the information needs of critical care physicians.

Danielle Groat, PhD

Developed artifical intelligence methods to detect impaired awareness of hypoglycemia in Type 1 Diabetes which can lead to loss of consciousness and death. Evaluated these clustering and deep learning methods on continuous glucose monitoring system data made available through Tidepool.org and studies done at the University of Utah.