THRIVING

The iTHRIV Newsletter

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Biomedical Data Science Innovation Lab 2023 Highlights

Biomedicine depends upon the close interactions of experts having complementary backgrounds in education, technical skill sets, and motivations. Many interdisciplinary projects require rich intellectual networks and a trusting community to sustain collaboration over time. Digital communications technology has made it possible to form some research collaborations over great distances. Investigators developing new research projects, often interact via email, telephone, and video conferences in develop their project specific aims and research plans. Such abilities to exchange information via the internet are critical to the rapid development of research projects in an era where science is fast moving and research progress is time sensitive. However, the elements of direct human interaction are muted by such technology, with a resultant loss of certain creative ability to address biomedical research challenges in novel ways. Large scale conferences offer a means for face-to-face interactions but, given a densely packed meeting schedule involving numerous activities, investigators may not enjoy the dedicated time needed to allow new perspectives on collaborative research challenges to germinate. As such, despite the expertise marshalled for any particular project, inevitable academic time pressures work against dedicating time specifically to the intellectually creative process of novel idea generation. The Biomedical Data Science Innovation Lab (BDSIL)

provides one approach to foster team science and innovative research to address complex clinical issues such as COVID-19. The BDSIL developed and hosted online data science skills training webinars and workshops as well as a one week in-person intensive summer workshop focused on team building and research grant proposal development. Led by Dr. Jack Van Horn, the BDSIL is a collaborative effort supported by iTHRIV, the UVA Brain Institute, the UVA School of Data Science, and the UVA School of Arts & Sciences.

Figure 1: A word cloud of what the accepted *Biomedical Data Science Innovation Lab* 2022-2023 participants had hoped to gain or learn during our activities this year.

The goal of the 2023 BDSIL was to foster the formation of new interdisciplinary collaborations to generate creative strategies on the use of data science approaches for predicting secondary health effects of the COVID-19 pandemic. The BDSIL brought together quantitative and biomedical researchers, with expertise from the mathematical, statistical, basic science, and clinical biomedical fields, to address topics in biomedical data science critical to modeling and predicting when, where, and in what form such secondary effects on public health will occur. The BDSIL was designed as hybrid program of online team-building activities, a series of scientific and mentor presentations, and lectures by guest speakers, all culminating in a five-day in-person intensive event in June 2023 at The Lodge in Kenmore, Washington.

Thirty-five early-mid career faculty were selected to participate in the 2023 BDSIL from across the country, including 6 from iTHRIV partner institutions. The BDSIL Mentor team was comprised of more senior investigators with complimentary skill sets who were able to pass on wisdom and insight to the next generation of investigators. Mentors met with the

teams as they were forming to provide feedback, guidance, and direction. 2023 Mentors included Katherine Kim (UC Davis), Madhav Marathe (UVA), Julie Roper (Panorama Group), Vinay Pai (FDA), and Vivien Bonazzi (Deloitte). Additionally, the BDSIL includes Provocateurs - domain experts who give short but disruptive talks, seeking to expand the bounds of the thinking of participants to help them envision new directions they haven't considered. Provocateurs for 2022-2023 BDSIL were Alex Bui (UCLA), William Petri (UVA), Micaela Parker (Academic Data Science Alliance), and Shawn O'Neil (University of Colorado).

To provide the necessary background on ethical challenges of AI and the data science which accompanies it, we conducted the Foundations of Biomedical Data Science Seminar Series. This virtual lecture series covered the basics of data management, representation, computation, statistical inference, data modeling, & other topics relevant to "big data" biomedicine. The seminar series provided essential topic introductions suitable for individuals at all levels of the biomedical and computational sciences community. All video presentations were streamed for live viewing, recorded, & are now posted online for future viewing & reference.

The one-week interactive workshop provided an opportunity for the development of multidisciplinary projects which link data science and a major challenge area in COVID-19. Eight projects formed and 6 of these are continuing to build on their activities from the workshop to develop their projects into NIH or NSF proposals. Additional activities from the in-person workshop included the creation of a position paper on the public health consequences of COVID-19 and data science for submission to a peer-reviewed periodical.

Preparations are already underway for the 2024 Biomedical Data Science Innovation Lab which will focus on Building Partnerships for Generative Artificial Intelligence Training in Biomedical and Clinical Research. iTHRIV is proud to continue our support of this innovative team science learning opportunity! Applications will be accepted starting soon: Biomedical Data Science Innovation Lab and Seminar Series (virginia.edu)

Collaborative Undergraduate Biostatistics Experience (CUBE)

Dr. Alexandra Hanlon, iTHRIV Research Methods Core Co-Director at Virginia Tech (VT), and her team (Alicia Lozano, MS; Monica Ahrens, PhD) were recently awarded $1.25 million dollars from the National Institutes of Health (NIH) to lead the Collaborative Undergraduate Biostatistics Experience (CUBE) program. The eight-week summer program for underrepresented undergraduate students in STEM is funded jointly by the National Institute on Drug Abuse (NIDA) and the National Institute on Alcohol Abuse and Alcoholism (NIAAA) to diversify and bring awareness to the fields of data science and collaborative biostatistics. The initial weeks of the program focus on training in introductory biostatistics and basic R programming, with professional development sessions covering topics such as communication, team science, scientific writing, and presenting research.

This summer, three students were hosted at VT under the NIH award, and two additional students were hosted at the University of Virginia (UVA) through integrated Translational Health Research Institute of Virginia (iTHRIV) funds under the leadership of iTHRIV Research Methods Core Co-Director at UVA, Dr. Sarah Ratcliffe, and her team (Genevieve Lyons, MS; Jennie Ma, PhD). All students receive the same technical training

and professional development series, as well as the opportunity to apply their knowledge to a collaborative research project with mentors located at each site (VT, UVA).

This summer's CUBE students hold majors in Statistics, Global and Public Health Sciences, Biology, and Economics. Four of the five students are entering their senior year, with the fifth a rising junior. Their home institutions include: Cornell University, Purdue University, California State University East Bay, University of Dayton, and University of Massachusetts Amherst.

The students' final collaborative projects focused on a variety of research topics. VT students applied their knowledge to projects involving addiction and behavioral economics under the mentorship of Dr. Alexandra DiFeliceantonio (2020-2022 iTHRIV Scholar alum) and Dr. Jeff Stein. CUBE 2023 student, David Henderson, worked with Dr. DiFeliceantonio to examine the impact of cognitive restraint on flavor nutrient conditioning. Alicia Alvarez and Nhu Thieu (Makara) Le collaborated with Dr. Jeffrey Stein on their individual projects: one seeking to examine the effects of specifying certainty of rewards in standard delay discounting tasks on measures of delay discounting (DD) and perceived certainty, and another examining the mediating effect of DD on the relationship between simulated scarcity with cigarette craving and demand. At UVA, students Chloe Barnes and Maggie Shideler, were mentored by Well-Being Specialist, Matthew Fritts on two individual projects seeking to examine the impact of an employee well-being intervention on mental health outcomes and the moderating effect of gender on this relationship. At the end of the program, all five students presented their findings in an oral and poster presentation at summer research symposia held at each site.

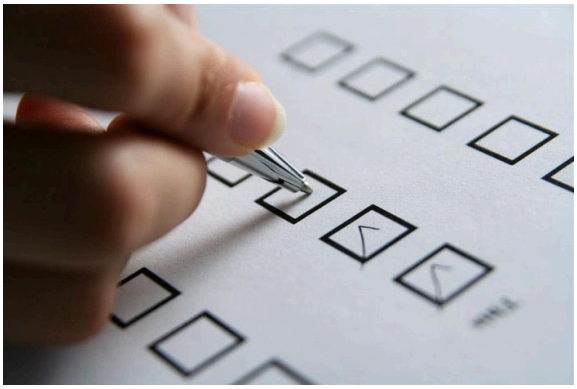
Students expressed how much they enjoyed working on their collaborative project, as it gave them the chance to dive into current and pressing research topics. Alicia Alvarez said that her favorite part of her summer experience was "working on the project and seeing actual biostatisticians at work." She continues, "Being immersed in the real-world aspect of it has been great, just to see how people actually work in the field, because you don't really get to experience that when you're in class."

Regardless of their educational goals or intended career path, the goal of the CUBE program is for students to leave the program with knowledge that will support their ongoing professional development. All five students that participated in CUBE for the summer of 2023 expressed their intentions to apply to graduate school, one of which did not originally plan to attend. CUBE student Makara Le states, "I would have never considered doing a Ph.D. in statistics before this program, but now I am considering it and looking into different types of opportunities like that." Out of the five students, three specifically expressed their plans to pursue graduate school in either Data Science or Biostatistics.

The combined support of funding partners, including the NIH R25 award (1R25DA058482-01), iTHRIV, Merck, UVA's Department of Public Health Sciences, as well as VT's Fralin

Life Sciences Institute (FLSI), and the Institute for Society, Culture, and Environment (ISCE), contributed to the success of program for summer 2023. The NIH R25 award at VT will support approximately 10 students per year over the next 4 years, and additional funding opportunities will be sought in the hopes of expanding the program at UVA next year and into the future.

The iTHRIV Scholars Program is accepting applications for the 2024 Scholar Cohort



The iTHRIV Scholars Program is excited to share the release of our Request for Applications 2024 Scholar Cohort!

iTHRIV seeks to support highly qualified early career faculty for activities related to the development of a successful clinical translational research career. The iTHRIV Scholars Mentored Career Development Program aims to develop the next generation of clinical and translational researchers in principles of data science, the conduct of rigorous and reproducible science, and to promote team science as a means to enhance innovation and discovery in health-related research.

To learn more, click on the appropriate institution's PDF document below. The iTHRIV Scholars RFA is the same for each institution. However, please note that there is an institution specific addendum at the end of each document. Be sure to read the RFA in its entirety.

Please contact the iTHRIV Scholars Program Manager, Amy Harrigan with any questions.

Key Dates:

- Request for Applications released: **Tuesday, October 3, 2023**
- Letter of Intent & Department Chair/Head Unit Letter of Commitment: **Friday, December 1, 2023 by 11:59 pm (required)**
- Full Applications Due: **Tuesday, January 16, 2024 by 8:00 am**
- Interviews by Invitation: **Between March 1 and April 1, 2024**
- Notification of Appointment: **By April 30, 2024**
- Appointment Begins: **July 1, 2024**

Information sessions will take place via Zoom on October 17th at 12:00 pm (as part of the iTHRIV Scholars Symposium, see link for event registration), November 2nd at 10:15am (Zoom link), and November 8th at 10:15am (Zoom link)

iTHRIV Under the Microscope

What is your current role at Carilion Clinic?
I am a manager in the Carilion Clinic Community Benefit Team. In my role, I am responsible for facilitating the Community Health Assessment process every 3 years for each of our hospitals and creating the implementation plan in response to the identified community needs. In addition, I manage our community grants and am also involved in community sponsorships. Lastly, working in collaboration with our Tax department, I help generate our community benefit report to the IRS as a requirement of a not-for-profit healthcare organization.

How does your job relate to the objectives of iTHRIV?
Presently, I lead the Community Engagement Steering Committee (CESC) in the Community and Collaboration Core. Community relationships are a big part of my role within Carilion and it translates well to working with the CESC. Over the last 2 years, this group improved a survey on barriers and facilitators for community engagement in research. The findings will be published and presented at conferences. The CESC also provided valuable feedback which was incorporated into the second submission of the iTHRIV grant around finding, housing, and visualizing data for community organizations.

What is something you would like to share that people may not know about you?
I grew up in Oak Ridge, Tennessee, a major site for developing materials for the Manhattan Project during World War II and my grandfather worked in a uranium enrichment facility. I graduated from Centre College in Danville, Kentucky and later earned a Master of Public Health from East Tennessee State University.

What do you like to do outside of work?
Running and outdoor activities are a passion I share with my husband; although these pursuits are on pause as we raise our 5 year and 15-month-old children.

Meet an iTHRIV Mentor

Christopher M. Kramer MD

George A. Beller MD/Lantheus Medical Imaging
Distinguished Professor of Cardiovascular Medicine
Chief, Cardiovascular Division
University of Virginia Health

"Dr. Christopher Kramer is a great mentor. He genuinely cares about the success of his mentees and is willing to go out of his way to help them achieve it. He is exceptionally generous with his time and truly invested in my career. Dr. Kramer is a world-renowned expert in cardiovascular Imaging, but besides his extraordinary leadership, I admire his kindness and sense of humor the most. It is a true honor to have been trained with him. I am grateful to have such a fantastic mentor."
- Patricia Rodriguez-Lozano M.D.

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