



HARVARD MEDICAL SCHOOL AND
BRIGHAM AND WOMEN'S HOSPITAL

TechFoundation Remote Summer Internship Program Guide





Program Introduction



Purpose

Beyond the tragedies of the lives lost, health compromised, and economies shattered, the COVID-19 crisis deeply disrupted the traditional academic summer internship model wherein bright, aspiring students had the opportunity to experience life science research and apply data analytical skills learned in classes to real-world medical research. The TechFoundation Remote Summer Internship Program was born out of a desire to help the medical educational system return to a sense of normalcy after so much disruption. The incredible success of the program in its first year (2020), however, led us to think bigger about the opportunities and benefits which remote internships can offer to talented students for whom a traditional in-person internship might not be logistically or financially feasible.

Design

Time Frame: With an 8-12-week time frame, the internship program is intended to be long enough to provide students with a meaningful experience while also fitting into most hospitals' time limits for unpaid internships.

Data Science Education (4-10 hours/week): We aim to provide research trainees with a solid basis in the computational and analytical tools used by medical researchers to turn raw data into meaningful science. We have developed a curriculum of online courses and webinars that will advance their knowledge of key quantitative competencies.

Medical Research Immersion (30 hours/week): Each research trainee is given the opportunity to support real state-of-the-art medical research, from raw data collection to data analysis and analytics. Each participant is partnered with a Principal Investigator (based at Harvard Medical School and/or the Brigham and Women's Hospital) and participates in one of the PI's current research projects. Some, but not all, of the interns from will even be included on one of their PI's upcoming publications, which is a testament to the contribution they are able to make over the short period of time the program runs. Lastly and new for 2023, for top students within the program, an optional on-campus week of meetings, clinician shadowing, and augmented learning experiences in Boston and Harvard Square will be provided.

RT Support: In addition to a modest **scholarship of \$5000 for school tuition/supplies**, participants are given access to high quality online training resources for data science and statistical analysis. Participants also receive IRB training and certification at the start of the program.

PI Support: Recognizing that "virtually hosting" a research trainee (RT) for the summer is an investment of time and effort that might not pay off (it is often difficult enough to get an in-person employee to be a net value-add to a project within months of joining, let alone a remote intern for a few weeks over the summer), the TechFoundation is dedicated to making the experience as seamless and low-maintenance as possible for PIs. In coordination with the

hospitals administration, the TechFoundation administers all logistical/secretarial aspects of onboarding (HIPPA training, IRB certification, etc.) and data science skills training.

Audience

The program is targeted at exceptionally strong rising seniors and graduate students with a STEM background (generally), and attracted over 100 applicants from the leading schools in the country in its pilot year. A total of eleven spots were awarded in 202 to students who not only excelled academically, but also demonstrated humility and an upbeat attitude towards some of the more mundane realities of research as the most junior member on a team. In fact, we turned away some students with impeccable scores and resumes because we did not believe they would be fit into the ethos of the program, which places a strong emphasis on appreciation and gratitude for the sacrifice which the PIs put into taking on an intern, particularly for a short period of time.

Student Testimonials

"Prior to this internship, I had zero exposure to deep learning and neural networks, but I now have successfully implemented a neural network and I understand the inner-workings of it enough to optimize it for our needs."

Cornell University, Graduating Senior in Biological Sciences

[The program is about] empowering the next generation of talent in the medical world with professional training.

Columbia University, Graduate Student in Bioengineering

Thanks to the summer program at TechFoundation, I learned how to navigate the "just in time", fast-paced nature of working on a project without much prior knowledge in the field of medicine.

University of Pennsylvania, Graduate Student in Computer Science

Speaking with Dr. Alexander. It was very helpful to hear his advice about being successful in medical school and constructing a residency application. I also enjoyed hearing about his path as the first medical student and physician in his family.

Dartmouth College, Rising Senior in Computer Science and Biology

"I've learned more about spreadsheet functions from the DataCamp courses so far than I have in any class I've taken on data analysis."

University of Virginia, Rising Senior in Finance and Information Technology

*"I took over 90 percent of the project while Dr. Nazim in Dr. Golby's Lab directly supervised me to answer my questions and help me through the process. I handled over 300 DSA images with size 800*800 and use Python and OpenCV to perform data pre-processing."*

Columbia University, Graduate Student in Bioengineering

"As a Research Trainee for Dr. Kei Ouchi, I drafted IRB documents, screened and enrolled patients using Epic medical software, and entered patient medical data using RedCap software."

University of Virginia, Rising Senior in Finance and Information Technology

This internship was a wonderful opportunity to take self-directed action to improve my skills in data science and medical research in place of my disrupted plans this summer. With the help of my PI, the other PI's, and the educational resources provided by the internship, I was able to expand my knowledge of programs like Python and Excel and learn about the myriad of paths there are into the medical profession.

Colby College, Rising Senior in Mathematical Sciences

It was a great opportunity to learn about the clinical research process and about urology, a medical field where I had little prior experience.

Rice University, Graduate Student in Bioengineering

Schools Represented by 2023 RTs

- ❖ MIT
- ❖ Brown University
- ❖ Dartmouth College
- ❖ Princeton University
- ❖ Stanford University
- ❖ Colby College
- ❖ Northwestern University
- ❖ University of Pennsylvania
- ❖ University of Chicago

PIs & Departments Represented in 2023 Program

Principal Investigators	Departments
Alexandra Golby, MD	Neurosurgery
Christopher Baugh, MD, MPH	Emergency Medicine
Emily S. Ruiz, MD, MPH	Dermatology
Erik K. Alexander, MD	Endocrinology
Kei Ouchi, MD, MPH	Emergency Medicine
Marie E. McDonnell, MD	Diabetes
Irene Ghobrial, MD, PhD	General Surgery Head & Neck
Rosh Sethi, MD, MPH	General Surgery Head & Neck
Alexander Turchin, MD, MS	Endocrinology
Gregory Piazza, MD, MS	Cardiology
Christian Lattermann, MD, PhD	Sports Medicine



Program Structure



Scheduling

Program Schedule

- Applications Open (3 months): October 1 - December 31
- Admissions Process (2 weeks): April 1 – April 15
- Onboarding Process (3 months): April 16 – June 15
- Initial Training (2 weeks): June 15 – June 30
- Project Immersion (8 weeks) July 1 – August 26
- Staff wrap-up & reflection (1/2 week): August 27 – August 31

Typical Weekly Schedule

- Tuesday 2-3pm: Fireside chat with a PI
- Thursday 10:30-11:30pm: Group call with staff
- Friday 2-3 pm: Group presentation & check-in

Educational Enrichment

Fireside Chats

We ask each PI to join our trainee cohort once during the program for a “fireside chat” or “Clinician/Researcher Profile” where they discuss their life in medicine.

Topics of interest include:

1. Why did I choose my field and what do I actually do day-to-day?
2. What are the prospects for my field over the next 40 years?
3. How has my field been effected by COVID?
4. What is a current research project I’m working on?

Online Resources Provided

Main Educational Programs

- ❖ DataCamp

Additional Educational Resources and Certification Programs

- ❖ Python Institute

To Apply

Applications are currently being accepted through Handshake.

Search: “TechFoundation-Brigham Medical--2024 Remote Summer Data Science and Medical Research Internship at Brigham and Women's Hospital / Harvard Medical School”

For questions, please contact joriley@techfoundation.org.