ENGAGED DATA SCIENCE

2022

ANNUAL REPORT
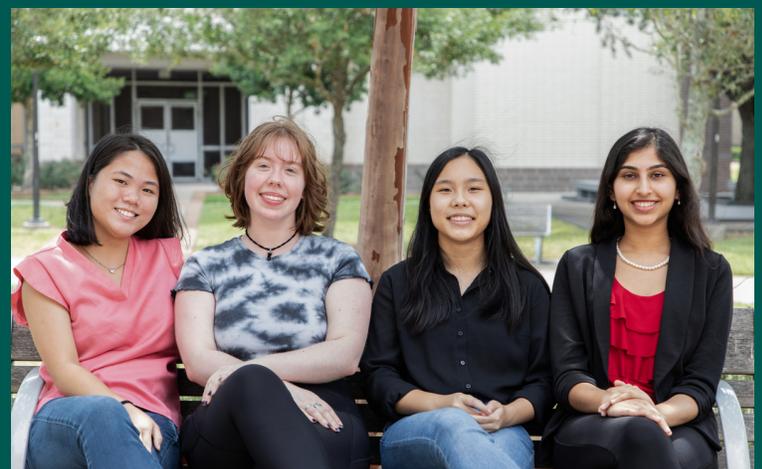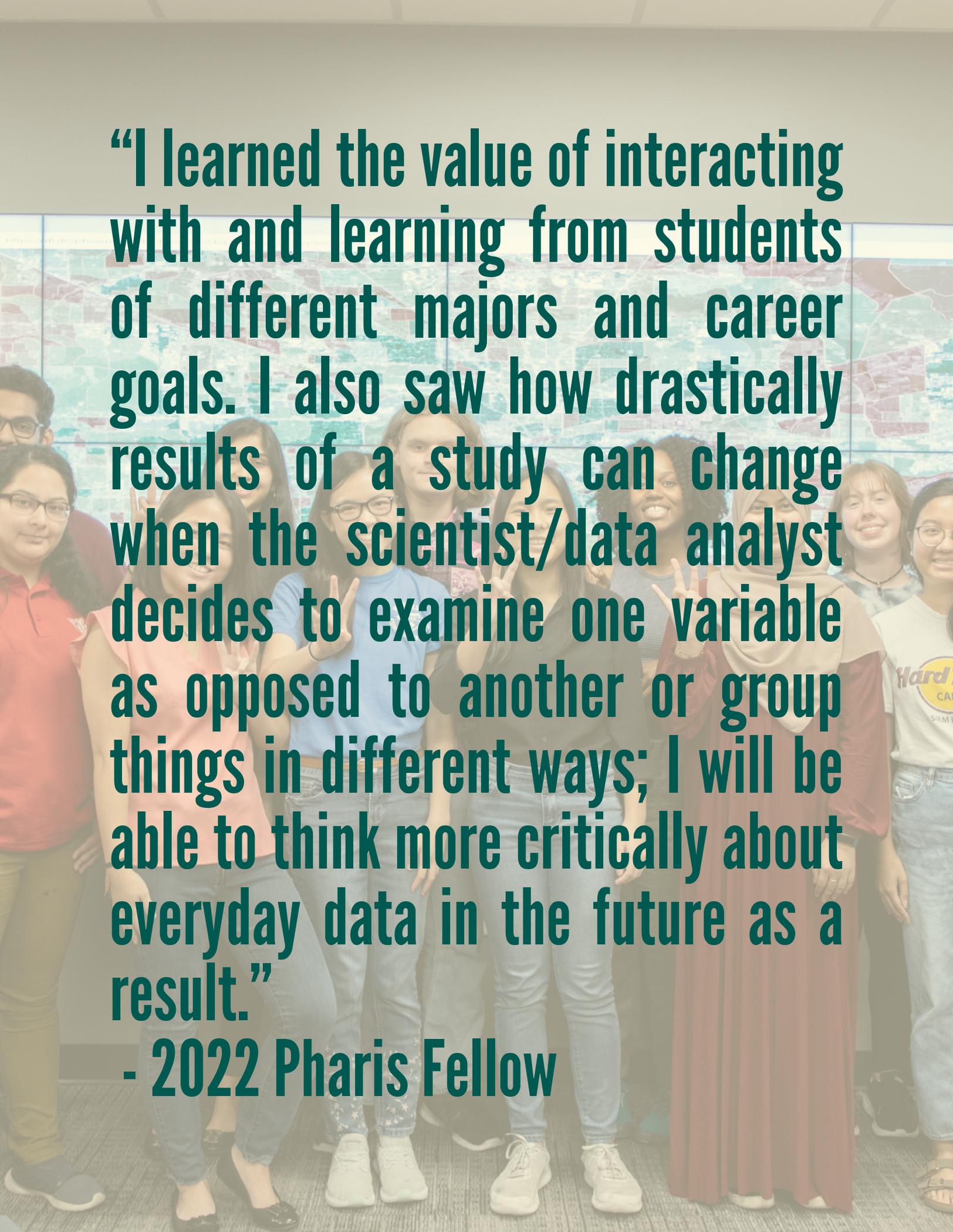
The Honors College
UNIVERSITY OF HOUSTON

Hewlett Packard Enterprise
Data Science Institute
University of Houston

"I learned the value of interacting with and learning from students of different majors and career goals. I also saw how drastically results of a study can change when the scientist/data analyst decides to examine one variable as opposed to another or group things in different ways; I will be able to think more critically about everyday data in the future as a result."
- 2022 Pharis Fellow

Welcome

The origin of the Engaged Data Science office stretches back nearly 10 years when Peggy Lindner and I started recruiting small groups of undergraduate students to work on summer data projects through the Data Analytics in Student Hands (DASH) program. The driving insight was that the ways in which community members – and even university students – felt excluded by the new developments in data science, including machine learning and artificial intelligence, were partly the fault of bad educational practice. Our intuition was that student-led project-based learning provided a pathway for addressing the growing disconnect between the learning experiences students were receiving in university classrooms and the rapidly changing knowledge landscape in which they were living their lives.

As we expanded the scope of our work to support collaborative projects developed by UH students and community members through the Community Health Workers Initiative (CHWI) and Honors in Community Health (HICH), our conviction that student-led projects should be a central feature of the undergraduate experience grew. We also recognized there was a potentially transformational opportunity to unify our undergraduate data projects with our community engagement work by offering a connected set of project-based curricular, co-curricular, and services activities.

The pages that follow describe the set of programs that emerged from our earliest work in DASH including the interdisciplinary Data & Society Minor Degree program and the George "Trey" Pharis III Fellowship program. I am incredibly grateful for the partnership between the Honors College and the Hewlett Packard Enterprise Data Science Institute that enables this work. We have made tremendous progress since EDS was founded in 2019, and I am excited for the future of this work.

Sincerely,

Dan Price
Director, Data & Society
Co-Director, Data Analytics in Student Hands
Honors College
University of Houston

Executive Summary

In this report, we provide overviews of the core programs and activities supported by the Engaged Data Science (EDS) office while also highlighting the successes of the undergraduate students and community members we served during 2022. While there are substantial areas of combined activity with the CHWI and HICH, their activities are described in separate reports.

This report is divided into four sections beginning with an introduction intended to orient the reader by providing an overview of EDS that describes our mission and approach to quality improvement, introduces our program faculty and staff members, and and acknowledges our partners and sources of support.

The second section describes the Data & Society Minor, a 15-credit hour program offered through the UH Honors College but open to all undergraduate students at the University. Since its founding in fall 2020, the minor has grown steadily by attracting students from a wide range of academic disciplines to engage in project-based coursework that applies a humanities lens to the study of data science.

The next section describes the Pharis Fellowship program, a summer research experience for undergraduate students to build data projects to address locally relevant issues using real world data. The Pharis Fellowship offers an alternative model for undergraduate research experiences in which students receive guidance from an interdisciplinary mentor team focused on supporting students as they direct their own research from conception to completion.

The final section describes a portfolio of projects EDS supported during 2022. These projects provided undergraduate students with opportunities to work directly with community members to conduct research, build data tools, and implement programs that directly impacted the lives of community members across Houston.

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Overview of EDS

The Engaged Data Science (EDS) program at the Hewlett Packard Enterprise Data Science Institute (HPE DSI) was founded in fall 2019 to expand opportunities for students at the University of Houston to work on data science projects that use real-world data to examine issues relevant to local communities. Importantly, EDS focuses on broadening participation beyond those academic disciplines traditionally associated with data science and emphasizes activities that bring together diverse groups of students to work on self-directed data projects. EDS partners with academic departments and offices across the University of Houston to create a portfolio of programs open to students in all UH colleges.

Many of these programs are situated within the University of Houston (UH) Honors College as part of its broader set of Engaged Data and Community Health activities, including those offered by the Community Health Workers Initiative (CHWI) and Honors in Community Health (HICH) student organization. Integrating EDS supported programs into Engaged Data and Community Health amplifies the impact of our work by connecting our resources and expertise in data science research, educational design, and program evaluation with CHWI's deep expertise in responsive community engagement and HICH's broad pool of talented and committed students. Because of its interdisciplinary nature and role as a center of excellence in undergraduate teaching and learning, the Honors College is uniquely positioned within UH to house this network, which is fundamentally focused on using project-based and experiential learning to support students along individualized educational pathways.

Mission

Project-Based Learning

Across all our programs, student-led projects make up the core activities. When students are invested in a project it becomes a focal point for student learning that promotes engagement, creates opportunities for deep dives into content, and motivates acquisition of new skills. Our role as instructors and mentors is to create learning environments that foster students' senses of trust in themselves, each other, and the learning process.

Individual Pathways

Our commitment to project-based learning informs our view that the fundamental unit of success is growth along individual pathways rather than aggregate outcomes. For our undergraduate students, what matters is whether they had an experience that advanced their goals and supported their long-term aspirations, not the degree to which their understandings reflect our own. Our innovation rests in our ability to create communication feedback loops that allow us to better understand our impact on individual goals and continuously adjust our practice.

Making Transformation Visible

The inherent challenge in our commitment to individual pathways is how to understand change on a broader scale. We know that addressing systemic issues is only possible if individual trajectories can be contextualized within social and environmental structures. The goal is to make shared community transformations visible without resorting to simple aggregation that obscures lived experiences. Our opportunity as an interdisciplinary team is to apply new approaches to data science to this challenge and develop new models for university engagement with our students and communities.

Quality Improvement

Feedback Loops

Feedback loops are an important component of our project based learning and grounded theory approaches. They give us the space to have continuous and active conversations with students and CHWs on what worked and did not work for our projects/programs/activities. They also give staff and faculty space to redirect focus back to the mission and provide any additional training. Data collected from feedback loops is used to improve processes that do not add value to the students or CHWs.
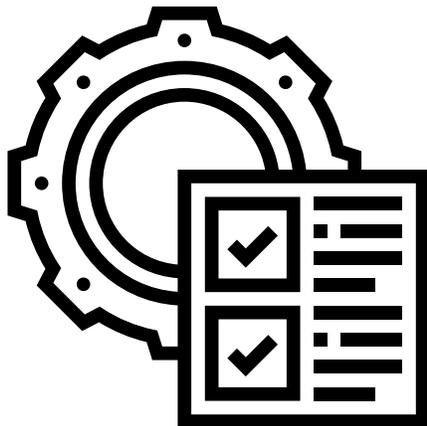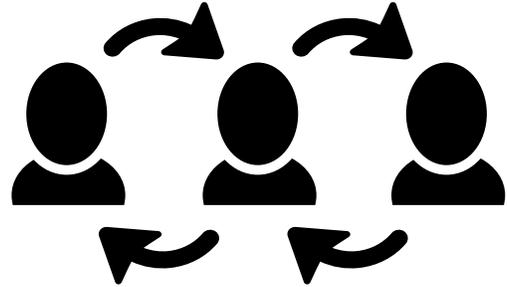
Student Assessments

At the beginning of each semester, our students are asked to form goals for the activities/courses they are enrolled in. At the end of each semester, students are asked to evaluate whether the course/activity helped them meet their goals and what impact their participation in our initiative had in their long-term trajectories. This has been helpful in evaluating whether our students feel like our activities (CHW and undergraduate) do have a direct impact on their lives.

Community Impact

Our community impact is evaluated through the health education CHWs deliver and the resources that they are able to coordinate for members of their communities. We focus on the trajectory of community members by evaluating whether the CHW played a role in helping them meet their goals and overcome negative social drivers of health. Evaluating the efficacy of our community impact takes an interdisciplinary role that connects data science and community health.
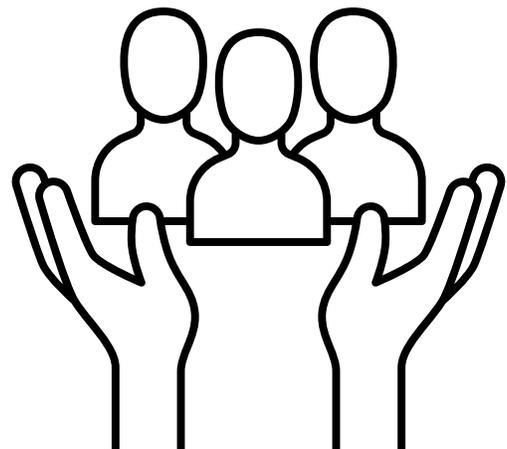
Personnel and Partnerships

Dr. Daniel Price

Associate Clinical Professor, Honors College
Director, Data & Society
Co-Director, Data Analytics in Student Hands
Advisor, Honors in Community Health

Dr. Andrew Kapral

Director, Engaged Data Science, HPE-DSI
Instructor, Data & Society
Advisor, Honors in Community Health

Dr. Ioannis Konstantinidis

Senior Research Scientist, Computer Science
Instructor, Data & Society

Dr. Peggy Lindner

Assistant Professor, Information Logistics Technology
Co-Director, Data Analytics in Student Hands

Dr. Ariel Ludwig

Visiting Assistant Professor, Data & Society
Honors College (through June 2022)

Karina George

Program Manager, Engaged Data Science
HPE-DSI and CHWI

Mabel Garcia

Academic Advisor, Data & Society
Honors College

UH Students Employees

Max Broekhuis

Jessica Castillo Patino

Mario Hayden

Abrigal Garcia

Montinice Jordan

Jenn Landicho

Griffin Litwin

Sondos Moursy

Dragomir Nonov

Vivienne Pham

Amanda Sengchiam

Krystyan Severin

Rida Shaikh

Michael Summers

Lori Vo

Mielad Ziaee

Program Partners

- Albert Schweitzer Fellowship of Houston-Galveston
- Angela House
- Center for Research, Evaluation, and Advancement of Teacher Education
- The Elizabeth D. Rockwell Center on Ethics and Leadership
- Humana Insurance
- Houston Independent School District
- Office of Undergraduate Research and Major Awards
- Tilman J. Fertitta Family College of Medicine
- Restoring Justice

Support for Engaged Data Science

As an education and outreach office within the Hewlett Packard Enterprise Data Science Institute (HPE DSI), core funding for EDS is provided through an ongoing and generous gift from HPE and funding from the Office of the Provost. Included in this support is funding for two full-time staff members, partial funding for instructors for the Data & Society Minor, and support for undergraduate student researchers through both the summer Pharis Fellowship program and academic year positions for individual projects. HPE DSI also provides core administrative support for EDS, as well as offices and instructional spaces in the Agrawal Engineering Research Building.

As a primary partner for EDS and the academic home of the Data & Society Minor Degree, the UH Honors College supports instructional activities within the minor through committed funding for instructional faculty, core administrative and academic advising staff, and instructional spaces within the M.D. Anderson Library. The Honors College also supports EDS co-curricular research and community engagement activities through its many interdisciplinary activities, including the Community Health Workers Initiative and the Healing Injustice Symposium.

EDS also receives funding for individual projects through internal awards from multiple offices at UH. During 2022, EDS projects received support from the Elizabeth D. Rockwell Center on Ethics and Leadership (Hobby School), the Digital Research Commons (UH Libraries), and the Justice Through Community grant (Honors College).

Annual support for EDS programs exceeded $400,000 during fiscal year 2022.

DATA AND SOCIETY MINOR DEGREE

The data science revolution isn't led by an elite group of believers, but by a groundswell of pragmatic approaches emerging together to ask the big questions while engaging with the world. The Data and Society minor degree explores the social impact of data science including how new techniques reflect broader economic and political systems and how these approaches impact humanities informed decision-making. This approach does not reduce society to a single mechanical ecosystem – it aims to honor all the ways we communicate with each other, and all the ways we convince each other to work together on shared projects. Understanding how data can be used to make an argument, how a representation is convincing or not, how visible and grounded a decision is, all go back to the pragmatic elements of collecting, analyzing, visualizing, and representing data. What we choose to measure, how we measure it, and the decisions we make using it are reflections of our values, our goals, and our biases. Data and Society is an attempt to develop types of thinking we believe will eventually be a sort of common wisdom, something that can be clearly stated and easily understood. The problem is that this common wisdom doesn't exist yet; we need to build it.

Overview
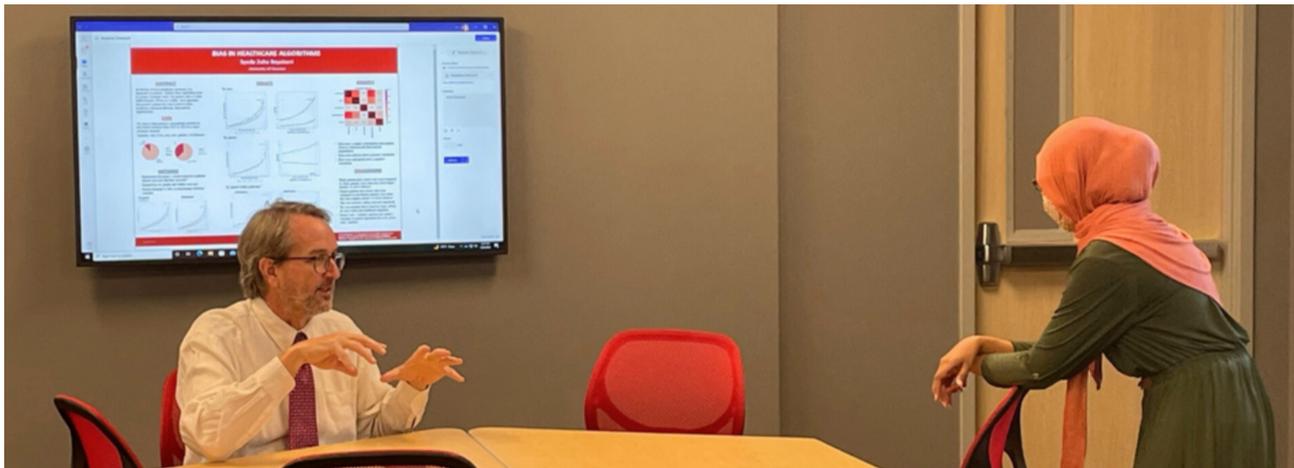
The Data and Society minor combines humanities-informed perspectives on data with real-world engagement. Through small project-based courses, students explore the social impact of data science while honing technical skills. A core strength of the Data and Society minor is that it serves an interdisciplinary student audience. Course enrollment is typically divided equally between students working towards data science related STEM degrees and students from social science, humanities, business, and education programs. This composition is critically important because creates space for an ongoing conversation that considers multiple perspectives on the roles data should play in our personal and social lives. Although the Honors College is an ideal setting for this type of program, it is important to note that the minor is open to all undergraduate students, regardless of previous affiliation with the Honors College. One of our goals is to increase participation in the Honors College through Data and Society courses.

2022 Student Participation

55 declared majors as of May 2023

123 total course enrollment

17 major degrees represented in Data & Society core courses

Degree Structure

To earn the minor degree, students must complete 15 credit hours of approved courses including two required core courses (HON 3350, HON 4350) and three courses drawn from our list of approved electives or approved through petition. Students often petition to include quantitative methodology courses from their major degree programs (e.g., data science, econometrics). We also encourage students to take our capstone research course (HON 4355) as an elective and use this course to extend exisiting projects from previous courses or one of the cocurricular experiences we offer (e.g., DASH, Pharis Fellowship).

Core Courses

Honors 3350 - Principles of Data and Society

This is the introductory course for the minor and is structured around student-led discussions of course readings that examine the historical foundations, philosophical underpinnings, and social forces that shape the role data plays in our society. The goal is to get students to engage with data science principles and techniques as seen through a humanities lens while taking the first steps towards developing their own long-term data projects. The course is organized in a series of sprints with thematically linked readings and assignments. The major assignment for the course is a multi-stage project in which teams of students first identify strands of research related to social determinants of health and then select individual topics within a selected strand to perform a deep dive into how the topic impacts health and well-being within Houston.

Borges' Library of Babel

HON 3350 begins with a reading of the Library of Babel, a short story by Jorge Luis Borges that imagines a nearly infinite library containing books made up of all the possible combinations of letters. The story and Borges' critique of knowledge built on ever more detailed classifications serve as a touchpoint for an ongoing conversation about the role data play in shaping the way we communicate ideas and make decisions within social systems.
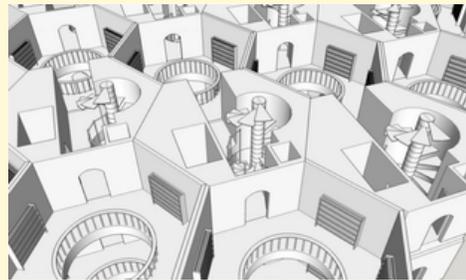
Honors 4350 - Data and Society in Practice

Building on principles introduced in HON 3350, this course grounds our humanities approach within the history and development of data science as students design a semester long project to use publicly available data to explore local social and public policy issues. The course is structured to provide students with multiple opportunities to present their project and receive feedback from peers and the course instructor. Students submit regular written reports as the work to develop a project prospectus that would be suitable for submission to an undergraduate research scholarship program.

Elective Courses

Honors 4355 - Engaged Data

This Honors Colloquium course serves as an optional capstone for the minor. The course is structured around individual data projects on topics chosen by each student with support from the instructor. Over the course of the semester, students present a series of lightning talks and provide peer feedback. Students also
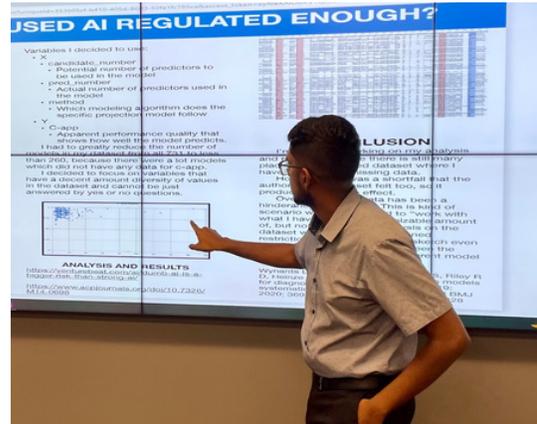
submit regular progress reports and meet with their instructor in a one-on-one setting at least four times throughout the semester. The final work product for the course is a research poster suitable for submission to an undergraduate research conference. Students are also encouraged to connect work for this course with other experiences (e.g., extending a project form HON 4350)

Directed Acyclic Graphs

Students develop DAGs during early in their projects to communicate ideas and organizing thinking. As projects develop DAGs initially increase in complexity as students develop deeper knowledge of their topics. Ultimately this complexity is distilled into clearer and increasingly targeted representations of the project.
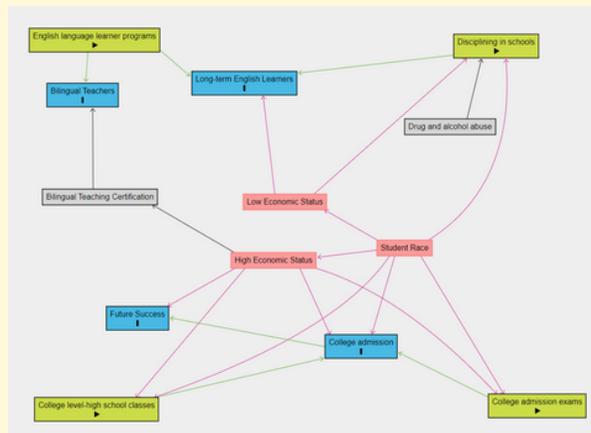
Honors 3397 - Special Topics Courses

In addition to Engaged Data, faculty in the Data and Society program regularly offer elective special topics courses in areas connected with ongoing research and engagement projects. When appropriate, these courses are also offered as electives for other Honors College minors. Below is a list of recent and planned special topics courses offered by our faculty.

- Spring 2022 - American Crime Story
- Spring 2022 - Data, Society & Public Health Community Interventions
- Spring 2023 - Health, Justice, Data
- Fall 2023 - Environmental Data, Policy, and Justice

Student Spotlight: Justin George

Justin George is a senior Mathematics major with minors in Data Science and Data and Society. From spring 2022 and spring 2023, Justin completed four semester-long experiences with our programs including three Data and Society courses (HON 3350, HON 4350, & HON 4355) and the Pharis Fellowship program during summer 2022. Over the course of his participation in HON 3350 (spring 2022), Justin developed an interest in researching K12 education. During summer 2022, he began working with data from Center for Research, Evaluation, and Advancement of Teacher Excellence (CREATE), a partner program housed in the UH College of Education that holds more than 30 million administrative records on the certification and employment of public-school teachers in Texas. Justin used these records to complete two research projects. The first tracked the movement of teachers between schools and districts during a five-year period from 2014 to 2019. The second used k-means clustering to examine the impact of the Covid -19 pandemic on teacher attrition. Justin presented his work at both our annual Data & Society Symposium and at UH's Undergraduate Research Day. Justin is a member of the UH Honors College and Intervarsity Christian Fellowship and will graduate in December 2023. He plans to pursue a career in data science following graduation.
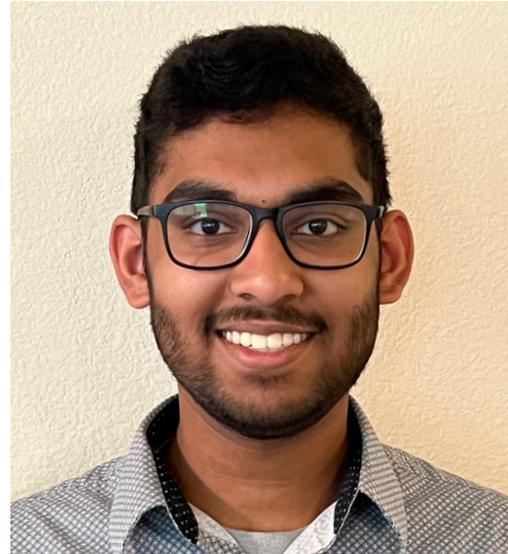
PHARIS FELLOWSHIP

Five years ago, when we launched the Pharis Fellowship, the goal was to create spaces that re-envision three puzzle pieces: undergraduate participation in meaningful research, community relevant university expertise, and philosophically engaged understanding of the challenges and opportunities implied by new tools in data science. As the summer program began to flourish, it became the blueprint for the way we implement project-based learning across our programs.

Each year, we bring together a new group of talented and passionate students and ask them to build projects guided by their interests and intuitions rather than our research agendas and expertise. By placing students in the role of a principal investigator rather than a research assistant, we push students to take ownership over the project and develop trust in their own abilities as researchers. By centering students, this approach also reflects our broader commitment to rethinking the role of expertise in community engaged research.

Overview

The overarching goal of the program is for each fellow to conceptualize a research project and develop it as far as they are able during the 10-week program. A key feature of the Pharis program is the freedom fellows have to self-direct their work within broad areas related to the application of data science to in healthcare and the social determinants of health. Through partnerships with UH research centers, local governments, Houston area non-profits, and private businesses, Fellows have access to large-scale and restricted use datasets on a variety of topics including healthcare, education, criminal justice, and the environment. By the end of the program, Fellows are expected to produce at least two scholarly products,

including a 15-minute academic presentation for delivery at the annual Data & Society Symposium hosted during the final two days of the summer program and a poster suitable for submission to the Undergraduate Research Day program hosted by the UH Honors College each spring. Throughout the summer, Fellows also prepare a set of internal deliverables as

checkpoints for peer and mentor feedback. The nature of these deliverables is kept intentionally flexible to account for differences in individual projects, but the list below provides examples of common submissions.

Pharis by the Numbers

14	Fellows representing five different colleges
>30	research seminars
400	hours of engagement over 10 weeks
6000	dollars of support for each fellow

Internal Deliverables

- Documentation of personal goals and aspirations for the program
- A project prospectus
- Dataset documentation (e.g., sources, datasheets, data dictionaries)
- Written weekly reflections
- An analytic dataset and documentation of the process used to create it
- Results from exploratory data analysis, including visualizations
- A written discussion of the insights gained through the project

Program Components

During the 10-week program, Pharis Fellows split their time roughly evenly between independent project work and participation in organized activities. The table below describes the major organized activities offered each summer.

Activity	Frequency (per week)	Description
Morning Meetings	1-2	Organizational meetings to make announcements, discuss scheduling, share general feedback and discussion
Seminars	2-3	Guest speakers on various topics (e.g., projects, datasets, analysis techniques, visualization tools)
DSI Short Courses	2	Courses on technical skills offered through the Data Science Institute
SURF Seminars	1	Seminars offered with the SURF program on general research and academic career topics.
One-on-one meetings	1-2	Check-in meetings with instructors to set and review personal & project goals
Office Hours	2	Optional office hours with project faculty and staff
Reading Groups	2	Student-led discussions groups on topics chosen by rotating leaders.
Project Groups	2	Small group working sessions with project group members and/or Fellows working on similar topics.
Lightning Talks	1	Presentations and discussion of projects with other fellows and staff

About George "Trey" Pharis III

George S. Pharis III (Trey) is a University of Houston alumnus (Philosophy '11) and worked as an information technology staff member in the UH Honors College until his passing in 2017. Trey was involved in the initial discussions and planning for the DASH program and had a particular interest in graph theory, which has helped to shape past and current DASH projects. As a poet, musician, and writer with interests ranging from social justice to number theory, Trey exemplified the intellectual curiosity and open worldview we hope to inspire in our students.
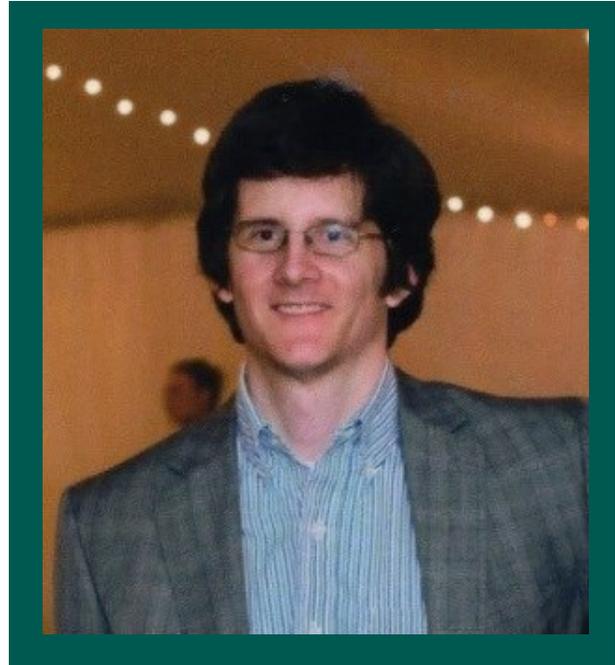
"I first met Trey over a decade ago, when I was still a young philosophy professor at the Honors College and he was an undergraduate with a keen and wide-ranging mind who wanted to talk about poetry, economics, social justice, and number theory – all at the same time! Trey started working for the Honors College IT group and with DASH more recently and he quickly made friends with the Honors family. About a year ago, he and I had started talking about some basic theorems in graph theory – he had an idea for solving an issue in how to color the edges of a complex graph – and we talked about how that might be important for the ongoing work in community health. He unfortunately didn't get to see these ideas come to fruition, but his thinking inspired the directions we're exploring this year and we're very pleased to be able to dedicate this inaugural year of George "Trey" Pharis Fellowships to hypergraphs and community health."

Professor Dan Price

2022 Pharis Fellows & Projects

Janelle Bauske Mathematics	Mental Health and Time: COVID-19 Edition
Cade Coligan Economics	Disparities in Rural vs Urban Public Education
Alpha Garcia Nutrition	Examining Equity in Public School Bond Programs
Justin George Mathematics	Analyzing teacher Retention Rates: Movement Trends within Texas
Boi Ha Health	Evaluate Roundtrip Transportation Programs by Generating Legacy's & Patients' ROI
Noah Harrison Computer Science	Rethinking Access to Healthy Foods: Investigating Food Access in Harris County
Loorysa Ulysse Mathematics	The Influence of Age, Sex, Race, and Ethnicity on Prevalence Rates of Co-occurring Health Conditions in Autism

2022 Pharis Fellows & Projects

Anna So Public Health	Determining the Effects of Limited Transportation on Heart Disease Risk Factor Prevalence
Sobia Syed Biology	Analyzing Consumer Complaints Against Companies in the Corrections Industry Using Qualitative Methods
Olivia Tran Biomedical Sciences	The Effects of Language and Economic Status on Healthcare Access and Care Partnership in Families of Children with Special Health Needs
Vivienne Pham Biology	Investigating the Deciding Factors of the Location of a Food Distribution
Mielad Ziaee Psychology	Evaluating Food Security and Summer Meal Access in Harris County
Samiha Zaman MIS & Marketing	The Impact of STEM-focused High School Education on Texas Student Outcomes
Neha Joshi Computer Science	The Impact of STEM-focused High School Education on Texas Student Outcomes

Student Spotlight: Olivia Tran

Houston is one of the most diverse cities in the entire country. However, many of those a part of this diverse population face adversities when it comes to accessing health care. Growing up in Houston, UH undergraduate Olivia Tran saw the impact that cultural and language barriers had on immigrant and refugee health.

Over the past summer, Tran participated in the George "Trey" Pharis Fellowship Program, in which she focused on researching the effects of language barriers and economic status on relationships and health care access between patients and health providers. Using data from the 2009-2011 National Survey of Children with Special Health Care Needs from the CDC National Center for Health Statistics, Tran examined access to health care and care partnership experience among families of children with disabilities.

> "Even if immigrants are able to access care, they may not feel as comfortable using it because of cultural differences and a variety of other invisible barriers."

Her results revealed that non-English-speaking, Supplemental Security Income (SSI)-receiving families exhibited different healthcare patterns compared to the other groups that were studied.

Tran said that the fellowship helped her grow "tremendously" as a student exploring different types of research. After having the exposure to quantitative and qualitative data analysis through her experience over the summer, Tran knows that she would like to continue this type of analysis in the future.

"There is so much to be done to improve immigrant health across the nation, especially in a city as diverse as Houston," Tran said. "I hope my results can shed light on the areas of greatest health need for our newest Americans and low-income populations."

This spotlight uses excerpts drawn from from an HPE DSI article written by Isabelle Sitchon.

ENGAGED DATA SCIENCE PROJECTS

The most difficult challenges involved with implementing project-based learning in an undergraduate setting are those imposed by existing structures that divide credited coursework, undergraduate research, and service-learning experiences. Community engagement projects rarely fit neatly into a single category of activity or wrap-up in time for the end of an academic semester.

The Data & Society minor degree and Pharis Fellowship address these structural issues by creating opportunities to connect curricular and co-curricular experiences and stretch the duration of student-led projects. The EDS office supports these efforts by maintaining a portfolio of projects that provided additional flexibility for student engagement and offer program evaluation services for programs working to implement project-based learning, including our own.

Food Insecurity in Houston's Third Ward

During summer 2022, EDS partnered with the Emancipation Economic Development Council (EEDC) and the Tillman J. Fertitta Family College of Medicine to support two undergraduate students, Mielad Ziaee (left) and Vivienne "Vi" Pham, to develop a set of projects examining issues surrounding food insecurity in Houston's Third Ward community. In separate projects, Mielad and Vi used data from the US Department of Agriculture and Harris County Appraisal District to examine equity in the placement of summer meal sites and food distribution sites. Each of these projects resulted in presentations at the annual UH Undergraduate Research Day, and Mielad also presented his research at the National Collegiate Research Conference hosted by Harvard University during January 2023.

Mielad and Vi also initiated a community-based participatory research project examining exisiting approaches to data sharing and communication across food distribution networks. The project began with a rapid review of the relevant literature that was guided by an iterative feedback process in which Mielad and Vi repeatedly presented their work to community members in the Third War through EEDC's "Everybody Eats" programs. With support from EDS, Mielad and Vi were able to continue there work during the 2022-23 academic year. Over the course of the year, Mielad and Vi worked with mentors from HPE DSI, the Fertitta Family College of Medicine, the EEDC to develop an abstract that was accepted for presentation to the American Pubic Health Association (APHA) and a manuscript that in preparation for submission to Frontiers in Public Health. This project is an example of EDS' model to support long-term projects that emerge from core programs (e.g., Pharis Fellowship).

Project Personnel

Undergraduate Students
- Mielad Ziaee
- Vivienne Pham

Mentors & Co-Authors
- Dr. Dave Buck (Fertitta Family COM)
- Dr. Andrew Kapral (HPE DSI, Honors)
- Linda Civallero (Fertitta Family COM)
- Alicia Neal (EEDC)

Highlights
- Four local and national conference presentations (UH URD, APHA NCRC)
- Manuscript in preparation for Frontiers in Public Health

Data, Society and Justice

The Data, Society and Justice program grew out of work initiated by two undergraduate students (Sondos Moursy and Nabeela Siddeeque) during 2020-21 and launched during summer 2021 under the leadership of Dr. Ariel Ludwig. The goal of the program was to develop a portfolio of projects focused on examining the role of data in the criminal legal system. During 2022, the program worked with community partners and received support from internal grants to implement multiple projects.

Digital Carceral Bodies

During fall 2021, the Digital Research Commons (UH Libraries) funded Digital Carceral Bodies (DCB), a project to collect a set of oral histories from formerly incarcerated individuals going through the process of re-entry into society. This project built on the success of a student-led arts program developed by Sondos and Nabeela for Angela House, a faith-based organization that provides housing and support to women during their first six months following incarceration. The goal of the project was to understand how the carceral system uses data to essentialize inmates and how lived experiences during reentry resist essentializing calculations. During 2022, the DCB project collected stories from more than two dozen people associated with Angela House and Restoring Justice. These oral histories were then transcribed by students working for EDS and are being prepared for placement in a digital public archive through the UH Library.

Project Personnel

Undergraduate Students
- Sondos Moursy
- Nabeela Siddeeque
- Jessica Castillo Patino
- Rida Shaikh
- Jenn Landicho
- Minh Ngoc Nguyen
- Montinice Jordan

Mentors & Community Partners
- Dr. Ariel Ludwig - Project PI (Honors)
- Dr. Andrew Kapral (HPE DSI, Honors)
- Dr. Dan Price (Honors)
- Drew Wiley (Restoring Justice)
- Monique Joseph (Restoring Justice)

Highlights
- Two internal grants awarded ($31,500)
- Healing Injustice conference hosted at UH Honors College
- ~30 oral histories collected
- Minh Ngoc Nguyen awarded PURS
- Sondos Moursy named PBK Key into Public Service Scholar

Healing Injustice Conference

During spring 2022, EDS received an internal grant award from the Elizabeth D. Rockwell Center on Ethics and Leadership at the Hobby School of Public Affairs to organize a conference on holistic indigent defense. Working with Restoring Justice, a local non-profit partner that offers legal

services to indigent defendants, the conference was organized around three strands focused on legal training, social service profession, and integrating legal and social service data. In addition, two nationally recognized leaders in the use of healing circles to support change in the criminal legal system, Dr. James Mcleary and Antong Lucky, provided keynote addresses for the conference. The two-day conference was hosted at the University of Houston on October 28-29, 2022 with more than 50 people attending.

Pregnancy in Texas Prisons

During fall 2022, Minh Ngoc Nguyen received a Provost's Undergraduate Research Scholarship to conduct research on the treatment of pregnant inmates in Texas correctional facilities. With mentorship support from Andrew Kapral and Ariel Ludwig, Minh conducted a review a longitudinal review of relevant sections of the Texas Administrative Code to identify regulations governing the inmate treatment during prenatal, birthing, and post-partum phases. Minh then reviewed personal accounts from pregnant inmates that were publicly available through the Texas Jail Project, Solitary Watch, and local media. Findings from the project identified dozens of examples of treatment of pregnant inmates that was either not in compliance with exisiting statutory requirements or where the Texas Department of Criminal Justice had not yet written relevant rules as required by the Texas Administrative Code. Minh is continuing towards completion of this project.

Complaints:	Administrative Code
Solitary segregation for pregnant inmates: "she was punished by being put in "the holding tank" where she is locked up alone. [...] In the holding tank by herself, she could go into labor and no one would know for hours."	Didn't find relevant policies in the administrative code HB 650 section 501.114: No segregation for pregnant inmates or inmates who gave birth during the preceding 30 days unless the director determines that it is necessary
Not getting the meds she needed: "I have already had to call the jail several times to make sure she got her medicine. She would call me crying at 9:50 (she is not allowed to call after 10) saying she hasn't received her meds that day. They are always very rude to me, but they do give her meds late at night if I call."	273.2 The last time it was fixed was 2012 Each facility shall have and implement a written plan for inmate medical, mental, and dental services. The plan shall provide (7) procedures for the distribution of prescriptions in accordance with written instructions from a physician by an appropriate person designated by the sheriff/operator (12) provide procedures that shall require that a qualified medical professional shall review as soon as possible any prescription medication a prisoner is taking when the prisoner is taken into custody

Student Spotlight: Sondos Moursy

Sondos Moursy has been involved with EDS programs since she participated in the Pharis Fellowship during summer 2020. During the 2020-21 academic year, Sondos and her partner (Nabeela Siddeeque) led a project to support formerly incarcerated women during the process of re-entry to society (see article excerpt below). This community engagement project was part of the Data, Society and Justice program and became the basis for the Digital Carceral Bodies project during 2022. As a student employee with EDS, Sondos was also involved in the planning of the Healing Injustice conference during summer 2022. Sondos graduated summa cum laude in December 2022 and is now a first-year law student at the University of Texas. Prior to graduating, she was named by The Phi Beta Kappa (PBK) Society as one of 20 national Key into Public Service Scholars.

The Spring, Texas native has spent the last three years researching the mass incarceration of women and was saddened to discover minorities from poor communities are disproportionately incarcerated, despite misdemeanors making up the majority of offenses. She proposes well-structured diversion programs as a solution.

"Our criminal justice system criminalizes poverty," she said. "When a main provider is ripped out of their home because they can't afford bail for a nonviolent crime, it creates a generational trajectory for the entire family. They don't have options."

In an effort to create an emotional support system for women returning to society after being in jail, Moursy initiated a weekly arts program at Angela House, a re-entry center for women in Houston which provides trauma-informed rehabilitative services. She calls it a "safe space" for the women to connect and share experiences. The work was conducted through UH's Action Research in Communities (ARC) program, a fellowship which offers exceptional undergraduates opportunities to conduct faculty-mentored action research based on service projects in the Greater Houston community.

Moursy also interned at the Houston Mayor's Office of Complete Communities where she developed a workforce initiative focused on providing legal income revenues for offenders. She hopes to one day become a human rights attorney to empower those in underprivileged communities.

Excerpt from "Going the Distance" by Chris Stipes

Data Analytics in Student Hands: Community Data Platform

Data Analytics in Student Hands (DASH) was founded by Dan Price and Peggy Lindner as an initiative to connect undergraduate students with opportunities to work on technically oriented data projects in support of local community-based organizations. One of their early summer programs, "the summer of apps" recruited students to develop mobile applications for community health and environmental education projects. As DASH evolved and expanded, it led to the founding of the Data & Society minor and Pharis Fellowship program. During fall 2021, EDS partnered with DASH and CHWI to launch a project to create a flexible community data collection and reporting platform for use by local non-profit organizations who employ community health workers to support care coordination. During 2022, the scope of the project was expanded to begin to develop tools for use by a non-profit (Restoring Justice) that provides holistic indigent defense services in Houston. Throughout this project, undergraduate students have acted as a self-contained development team with autonomy in project design and management. EDS faculty and staff mentors act as technical advisors and product managers .

Project Personnel

Undergraduate Students
- Max Broekhuis
- Lori Vo
- Abrigail Garcia
- Michael Summers
- Krystyan Severin
- Dragomir Nonov
- Jenn Landicho
- Amanda Sengchim

Mentors
- Dr. Peggy Lindner (Technology, Honors)
- Dr. Dan Price (Honors)
- Dr. Ioannis Konstantinidis (HPE DSI, Honors)
- Dr. Andrew Kapral (HPE DSI, Honors)
- Cindy Paz (Honors, CHWI

Program Evaluations

In addition to directly supporting undergraduate education and community engagement programs, EDS leads a set of program evaluation activities for internal and external projects focused on expanding experiential learning at the undergraduate level. During 2022, EDS expanded its program evaluation work to include three separate projects.

EDS Experiences

Part of the EDS mission is to rethink the way we assess undergraduate student success to account for progress along pathways towards individual goals. During fall 2021, EDS launched an effort to develop an unified approach to assessment for use across multiple student experiences, including Data and Society minor courses, the Pharis Fellowship, Honors in Community Health projects, and CHW Training Center certification courses. The core elements of this evaluation are a goal-setting process students complete at the beginning of each experience paired with an exit survey in which students evaluate their experience in view of their personal goals. During 2022, more than 250 individual student experiences were included in the evaluation. A team of EDS affiliated faculty and staff also began an internal review of goals submitted by participating students and began developing a survey instrument to establish a multi-dimensional measure trust among undergraduate students engaged in project-based learning activities. Elements of this program evaluation were presented at three national conferences during 2022 (e.g., Higher Education at Research Universities, American Education Research Association, American Public Health Association).

Project Personnel

Undergraduate Students
- Olivia Tran

Mentors & Partners
- Dr. Andrew Kapral (HPE DSI, Honors)
- Karina George (HPE DSI, CHWI)
- Dr. Andrea Link (ASFHG)
- Carol Jacob (ASFHG)
- Stacey Louie (College of Engineering)

Highlights
- Three presentations at national conferences (HERU, AERA, APHA)
- Alumni survey for Albert Schweitzer Fellowship of Houston-Galveston
- Curriculum evaluation for NIST funded project.

Mapping Student Pathways

One of our goals is to use projects to connect student learning experiences across multiple semesters and across curricular and co-curricular settings. To support this goal, we are working toward implementing a system to map and compare the pathways students take through our programs.
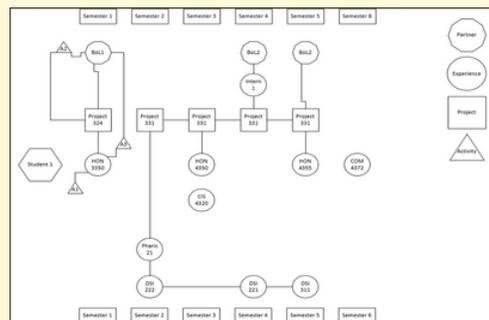
Albert Schweitzer Fellowship of Houston-Galveston

During fall 2022, EDS began working with the Albert Schweitzer Fellowship of Houston-Galveston (ASFHG), a non-profit organization that supports undergraduate students in developing community health projects, to assess the overall impact of the program on alumni participants. To evaluate the fellowship, EDS worked with ASFHG to design a survey for their program alumni, or "Fellows for Life" (FFL). Olivia Tran, a senior in the Honors in Biomedical Sciences program and an FFL, participated in this project as part of an independent study capstone research course with Andrew Kapral serving as her instructor. The goal of the survey is to examine the long-term impact of the ASF experience on FFLs across multiple domains including self-efficacy with respect to community engagement projects, cultural sensitivity in professional environments, and resilience to burnout. The survey was completed and deployed during spring 2023 resulting in 85 responses representing ~25% of all program alumni.
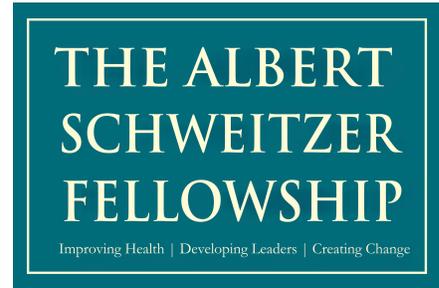
Engineering Curriuclum

As part of its mission to support innovation in undergraduate education, EDS provides program evaluation support to UH faculty and departments working to design and test new approaches to curriculum and instruction. During 2022, Dr. Stacey Louie (Cullen College of Engineering) received a $100,000 grant from the National Institute of Standards and Technology to develop a set of instructional modules to introduce documentary standards as part of undergraduate and graduate courses related to nanomaterials. Andrew Kapral is leading an evaluation for this project with the goals of assessing the quality of the instructional materials produced, their utility and usability in multiple course settings, and their impact on student knowledge and self-efficacy.
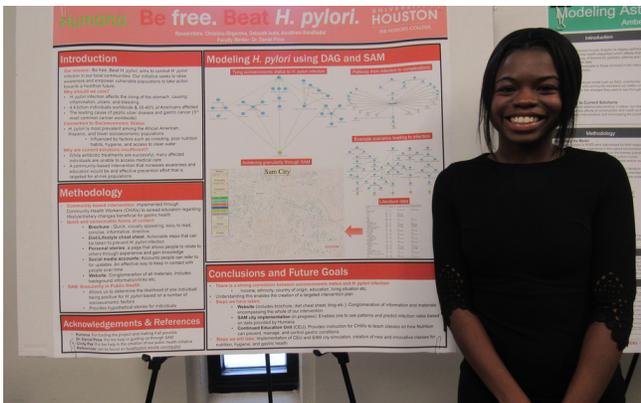
EDS and Honors in Community Health

Honors in Community Health (HICH) seeks to build healthy communities through a multidisciplinary approach to overcoming barriers for underserved populations. This collaborative, student-led organization uses its understanding of the social determinants of health to explore multiple types of service: community engagement, advocacy, and research. HICH provides all students at the University of Houston the opportunity to design, implement, and lead a wide variety of community health projects. EDS supports HICH by providing funding for one of its constituent programs, Project Engagement Encouraging Rising Students (PEERS), which is described on the next page.

General Body Membership
- 178 HICH Members
- 17 Fall Distinguished Members
- 17 Spring Distinguished Members

2022 Year Composition
- Freshman: 29%
- Sophomore: 23%
- Junior: 24%
- Senior: 24%
- Graduating Seniors: 13

PEERS
Project Engagement Encouraging Rising Students

PEERS, supported by the University of Houston, Honors College, Community Health Workers Initiative, and the Hewlett Packard Enterprise Data Science Institute, focuses on encouraging STEM education and providing mentorship to underserved students in grades 9-12. PEERS grew from and embodies the Community Health Workers (CHWs) model as simultaneous educators and advocates. Initially conceived in a CHW class, this program pairs high school students and the University of Houston undergraduates to create long-lasting, effective, and engaging community projects that are meaningful and relevant.

2022-2023 Updates

Over the course of the academic year, PEERS mentors worked with students at East Early College High School once a week on Fridays to guide them towards creating a community health project proposal following the theme. Each weekly module covered various research and community health topics. A successful change this year was that the PEERS program was a featured capstone project, making it part of the required curriculum for students that opted to participate. This year, PEERS also hosted the biggest competition day to date. Judges evaluated 15 projects on May 16th and announced 3 winning projects.

1,438 Total volunteer hours
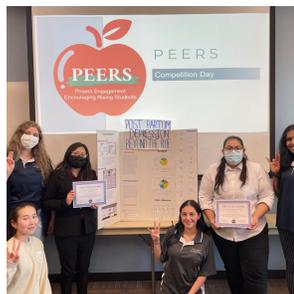
47 Students served

35 Undergraduate student volunteers

5 Project Heads
- Aleksandra Aiurova
- Erikah Calderon
- Vyshnavi Davuluri
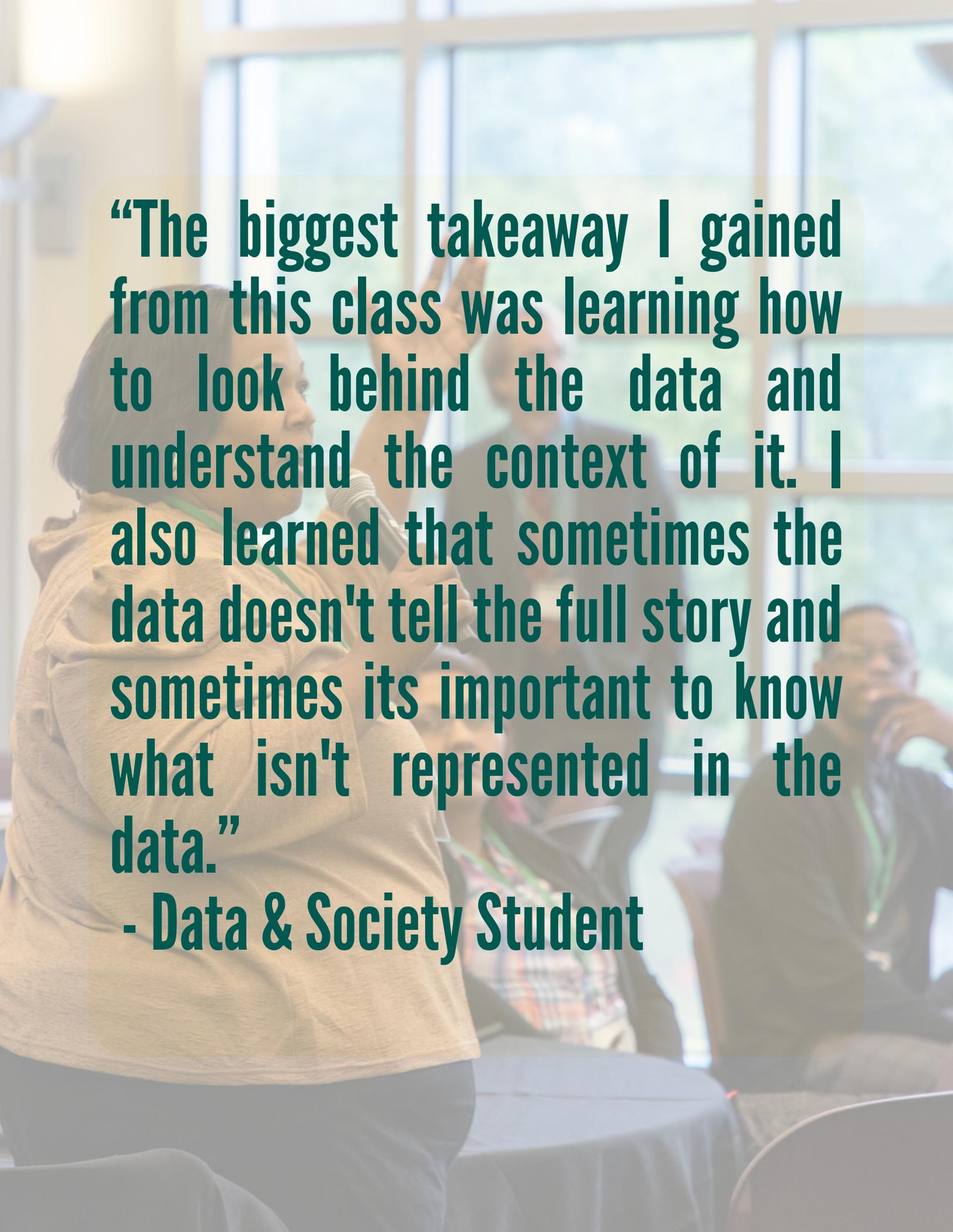- Mia Franchville
- Anna Maria Trabulsi

This year's theme: "If you had 5 million dollars, how would you improve the quality of life of Houstonians with disabilities?"

PEERS Capstone Competition Winners
- 1st place ($1,000 each): Postpartum Depression: Beyond the Blues
- 2nd place ($500 each): Kanes for Kids
- 3rd place ($250 each): Lupus in Color

"The biggest takeaway I gained from this class was learning how to look behind the data and understand the context of it. I also learned that sometimes the data doesn't tell the full story and sometimes its important to know what isn't represented in the data."
- Data & Society Student
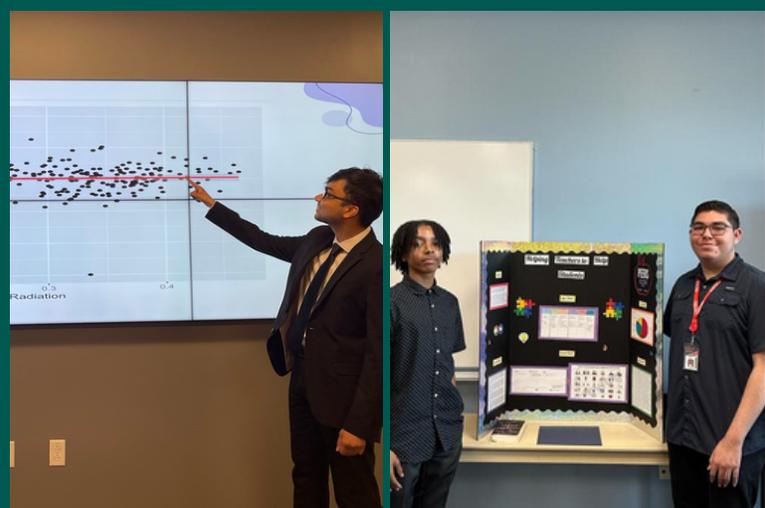
**Hewlett Packard Enterprise
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