

Data+ 2017 Projects

1) [Data Viz for Long-term Ecological Research and Curricula](#)

A team of students led by Biology Professor Emily Bernhardt will develop interactive R Shiny data visualization apps that will allow students and researchers to understand sixty years of ecological data collected at Hubbard Brook Experimental Forest.

2) [Electricity Access in Developing Countries from Aerial Imagery](#)

A team of students led by researchers in the Energy Data Analytics Lab and the Sustainable Energy Transitions Initiative will develop means to evaluate electricity access in developing countries through machine learning techniques applied to aerial imagery data.

3) [Mapping the Ocean Floor](#)

A team of students led by ECE Professor Martin Brooke will use ambitious data-processing strategies with the hope of providing a low-cost method of mapping the ocean floor.

4) [Open Data for Tobacco Retailer Mapping](#)

A team of students will work with UNC Epidemiology researchers to understand how open source data can shed insight on the tobacco retailer environment.

5) [Open Source Spatial Visualization for Public Health Intelligence](#)

A team of students will work on small-area health data mapping, in close collaboration with the Durham Neighborhood Compass, as well as with epidemiology researchers from UNC.

6) [Space, Time, Statistics, Mathematics, and Marriage](#)

A team of students will work with Sanford professor Christina Gibson-Davis and Mathematics professor Paul Bendich to build statistical and mathematical tools that will help understand how the distributions of marital and non-marital births differ from each other, and how these differences have changed over time.

7) [Visualizing Suffering: Tracking Photojournalism and the Syrian Refugee Crisis](#)

A team of students led by English professor Astrid Giugni and doctoral candidate Jessica Hines will analyze the context and dissemination of images of the Syrian Refugee Crisis.

8) [Nutrition Dependent Growth in the Laboratory Rat](#)

A team of students led by Duke Biology professor Frederik Nijhout, Northeast Ohio Medical University Anatomy and Neurobiology professor Rebecca German, and doctoral candidates Rick Gawne and Kenneth McKenna will study the impact of diet on organ and bone growth in developing laboratory rats.

9) [Quantifying Rare Diseases in Duke Health System](#)

A team of students led by School of Nursing professor and health informaticist Rachel Richesson, faculty from the Social Science Research Institute and the School of Medicine, and advisors from the National Library of Medicine, will leverage electronic medical record (EMR) data to quantify the number of rare diseases treated at Duke University Health System (DUHS) and to estimate the number and characteristics of patients affected by these conditions.

10) [Quantifying Phenotypic Evolution during Tumor Growth](#)

A team of students led by Duke Mathematician Marc Ryser and University of Southern California Pathology professor Darryl Shibata will characterize phenotypic evolution during the growth of human colorectal tumors.

11) [Validating a Topic Model that Predicts Pancreatic Cancer from Latent Structures in the Electronic Medical Record](#)

A team of students led by Biomedical Engineering professor Lisa Satterwhite will further the work of a 2016 Data+ team in predictive modeling of pancreatic cancer from electronic medical record (EMR) data.

12) [Visualizing Real Time Data from Mobile Health Technologies](#)

A team of students led by School of Nursing professor and health informatician Ryan Shaw will create visualizations of time series mobile health data in diabetes patients.

13) [Ghost Bikes](#)

A team of students will work with Cultural Anthropology and Global Health professor Harris Solomon to understand cycling-related injuries and deaths in Durham.

14) [Building a Duke SLED \(Duke Surgery Longitudinal Education Database\)](#)

A team of students led by Dr. Shanna Sprinkle of Duke Surgery will combine success metrics of Duke Surgery residents from a set of databases and create a

user interface for residency program directors and possibly residents themselves to view and better understand residency program performance.

15) [Comparing Exploration of Majors](#)

A team of students will initiate a study exploring the trajectories Duke students choose throughout the Undergraduate curriculum.

16) [Quantified Feminism and the Bechdel Test](#)

Using data curated by fivethirtyeight.com, a team of students will analyze the relationship between movies that pass/fail the test and various economic and aesthetic factors like the film's genre and budget.

17) [Controlled Substance Monitoring Visualization](#)

A team of students led by Dr. Rebecca Schroeder of Duke Anesthesiology will create an analytics and visualization tool to leverage pharmacy information management data to identify controlled substance accounting patterns among anesthesia providers consistent with an elevated risk of diversion for personal or alternate use.

18) [Classification of Vascular Anomalies](#)

A team of students led by Duke Civil and Environmental Engineering professor Wilkins Aquino and Duke Vascular Surgeon Leila Mureebe will apply machine learning algorithms to Continuous Wave Doppler (CWD) ultrasound data to classify vasculature of patients with trauma and acute limb ischemia (ALI).

19) [Mental Health Interventions by Durham Police](#)

A team of students lead by Duke Institute for Brain Sciences faculty Nicole Schramm-Sapyta will provide analytical consulting support to the Durham Crisis Intervention Team (CIT) Collaborative, a county-wide effort to provide law enforcement and other first responders with specialized training in mental illness and crisis intervention techniques.

20) [MyHealth Teams Data Exploration and Visualization](#)

A team of students led by Biostatistics and Bioinformatics professor Jessie Tenenbaum will curate and visualize self-reported patient medication data from a social health community site.

21) [Alumni Gifts and Data Analysis](#)

Building off the work of a 2016 Data+ team, students will investigate

commonalities and distinctions in alumni gifts, and attempt to understand and predict motivations for gifts of different types.

22) [Digital Rejuvenation of Medieval Paintings](#)

A team of students led by Mathematics professor Ingrid Daubechies will explore the feasibility of building an app that museum visitors could use to virtually rejuvenate paintings in museums. The app would require photographs taken by the user in the museum, as well as high resolution images provided by the museum website.

23) [Understanding Duke Research](#)

Based on Large-Scale Faculty Publication Records Leveraging the Scholars@Duke database, which summarizes all publications of all Duke faculty for the last five years, a team of students will work with faculty and staff from the Duke Network Analysis Center and the Office of the Provost to identify and visualize intellectual communities that exist across the university.

24) [Online Financial Behavior and the Internet of Things](#)

A team of students led by ECE professor and iiD director Robert Calderbank will spend ten weeks understanding how insights from "the internet of things" (IOT) can help shed light on analyses of financial decision-making.

25) [Analytics for Faculty Success](#)

Despite a multitude of opinions about the state of academia, comprehensive studies of hiring, publication, and grant-receiving among academics have only recently begun to emerge.