

Title: Building Data Science Competencies into Nutrition Science Training

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Abstract:

This short presentation will discuss current efforts to incorporate Data Science (Big Data) approaches and competencies into the existing Nutrition Science curriculum at the Friedman School. This initiative grew 'naturally' out of the need of investigators to generate, manage and 'mine' increasingly numerous and complex 'omics'-based data sets in nutrition research. Thus, our goal is to train a new generation of nutrition researchers with core competencies in Data Management, Analytics and/or Visualization and who are comfortable with the need to constantly upgrade these skills during their careers. A significant challenge has been to integrate this new training into an already 'full' program of didactic and experiential learning. Another has been to work with students who have not yet developed confidence in programming or computation. To meet these challenges we are partnering with the HNRCA's Nutritional Genomics Laboratory, The HNRCA Inflammation Research Cluster, The Tufts Computational Biology Initiative and most recently, with the Department of Computer Science.

The didactic component includes an emphasis on arriving at Friedman familiar with Unix and then developing R stats competency during the first year. This allows our students to compete for slots in TCBI bioinformatics modules. In addition, students take at least two formal courses (typically at Boston University) in bioinformatics, machine learning, database construction, etc.

The core of the experiential learning is fulfilling a Research Practicum and then a subsequent Directed Study (each one semester) developing the HNRCA's inflammation Interactome – a systems biology data resource linking genomics, epigenomics, environmental history (e.g., diet, exercise, sleep) and inflammatory markers with the emergence of cardiometabolic disease. Projects are presented formally to the Nutrition Science faculty. An alternative student project will expand data visualization in the microbiome pipeline at the Tufts Core Facility.

This is a start. We are excited by what the future holds.