

Data Sciences Academy

University of Arizona

The University of Arizona has had a complex history with data science programs. After two failed attempts to establish a Department of Statistics, the State of Arizona Board of Regents created a Department of Statistics in 1982. In 1997, the Regents dissolved the department, leaving the research and education needs of the statistical aspects of data science with no clear central unit. This led to a proliferation of statistics and data science activities designed to meet increasing needs.

Around 2008, the University chose to coordinate graduate education in statistics through a Graduate Interdisciplinary Program in Statistics (later named Statistics and Data Science). This approach is unique to Research I Universities. It has the advantage of flexibility in meeting the rapidly evolving research needs of a land grant University. This structure enables Statistics students to design and complete research projects that bring the science of statistics and data science to a broad array of disciplines, while at the same time creating statistical theory and methods suitable for modern needs. Because faculty from any unit can choose to become a member of the program, this created a place where data scientists can come together.

At about the same time, the Department of Computer Science hired an outside head. Based on internal divisions within the unit, a new computational science department was established. This unit was later joined with the library school to form a School of Information. In addition, the College of Public Health, in response to the increased aspects of data-intensive health science questions, created a unit (later a department) of Biostatistics.

At present, the University has six units – Biostatistics, Computer Science, Information, Management Information Systems, Statistics & Data Science, and Systems & Industrial Engineering – whose primary research and educational activities are closely associated to the data sciences. In addition, the university has the University Information Technology Service, the Statistical Consulting Lab, the TRIPODS (Transdisciplinary Research in the Principles of Data Science) center, and the Data Science Institute.

In late 2019, the newly installed Provost and Vice President for Research, to align the growing number of data science activities, created a new entity, the Data Sciences Academy (DSA). The Academy's role is to serve as an umbrella organization to coordinate and facilitate activities across campus and in the community.

In February 2020, the DSA held a design charrette to set its priorities. The outcome of the charrette led to its five key objectives.

- **Provide financial support and mentoring to jump start collaborative teams of investigators and their graduate students.** We will prioritize support for young investigators with a view to balance representation from diverse demographics and with an emphasis on societal impact. We can provide statistical support from the Consulting

Lab and technical support from the Data Science Institute along with course releases and graduate research assistant support.

- **Provide continuing education opportunities to those presently in the workforce.** The Academy is working with the Statistics & Data Science Program and the Departments of Mathematics and Computer Science to create a professional master's degree program. The program is designed to provide certificates to mark progress and to accommodate continuing education to its alumni.
- **Increase the research opportunities for undergraduate students who major or minor in the data sciences to participate in interdisciplinary research experiences.** The Academy is partnering with the Undergraduate Biology Research Program (UBRP) to pilot a program for undergraduate research in the life sciences. UBRP has engaged in this activity for more than a quarter century. The goal is to take lessons learned from this mature program and expend the opportunities beyond biology.
- **Provide a program of professional development in data sciences with K-14 educators.** The Academy has hired a K-14 outreach coordinator and launched a professional development program. Recently, the Academy partnered with the Southern Arizona Research, Engineering, and Science Foundation to submit a NASA grant for educator training in the data sciences applied to questions in the earth sciences.
- **Expose the public to educational opportunities in the data sciences.** Many individuals, especially from first generation students, became aware of the opportunities in the data sciences late in their undergraduate education or after taking their first jobs. Academy's efforts via websites, videos, and informational materials, will bring an understanding of educational and career opportunities to students, their teachers and counselors, and their families at critical times in their education, particularly in middle and high schools.

The Data Sciences Academy represents a new concept in coordinating activities at the University of Arizona. Thus, most aspects of what the Academy will eventually come to mean to the University are in the development of new relationships that are sustainable. Such a mission will certainly require time to take root and will face push back as it alters the usual course of business and with it new ways to distribute funding.

The Academy was launched days before the arrival of the COVID-19 pandemic. In this regard, sorting out whether slow progress is due to its newness or due to the restrictions put in place to keep us all safe during a pandemic is hard. Some offices are overwhelmed by new work responsibilities. Some staff are overwhelmed by personal responsibilities. It is hard to know from the outside what the issues are. In addition, the University's financial concerns led to reduced assets to many activities, including the Data Sciences Academy. Thus, the Academy has focused on financially modest infrastructure projects in anticipation of a larger program in the future.

Joe Watkins, Director
Data Sciences Academy
Professor of Mathematics
University of Arizona