THE OHIO STATE UNIVERSITY
TRANSLATIONAL DATA ANALYTICS INSTITUTE

# Data Science Leadership Summit (October 2020)

Session: Challenges & Best Practices for Data Science Institutes & Programs
Program: The Translational Data Analytics Institute at The Ohio State University

HISTORY: The Translational Data Analytics Institute (TDAI) represents the first investment The Ohio State University made through its $500 million Discovery Themes initiative. Spanning the grand challenges of OSU's Discovery Themes, TDAI was designed to foster the study, development, and application of translational data analytics solutions for researchers and students across every college. The University's and the state of Ohio's commitment of more than $125 million acknowledges a fundamental shift in higher education that accords a significant role to data in answering the most pressing and prevailing problems of science and in addressing the most vexing problems of human condition and sustenance. Officially organized in January 2015, it became a university-level institute in April 2017. Pomerene Hall serves as the home of TDAI and the physical hub of data science and analytics on campus.

RECENT ACCOMPLISHMENTS (AND LESSONS LEARNED):

COVID-Response: In March the Ohio Department of Health (ODH) came to Ohio State and asked for help predicting the course of COVID-19's surge in Ohio. Faculty from TDAI and other Ohio State institutes partnered with ODH, state government and the Ohio Hospital Association to form a rapid-response modeling team, a group that collects and analyzes data to predict the timing and scale of infection surges, as well as *what if* modeling to inform the governor's office's guidance for safe reopening of businesses and Ohio school districts. TDAI faculty remain engaged in comprehensive monitoring efforts alongside ODH experts. TDAI together with the OSU community was able to rapidly mobilize resources ranging from supercomputing capabilities and subject matter expertise to programmers and data sources in support of this urgent, collaborative effort, often repurposing existing research projects and educational efforts.
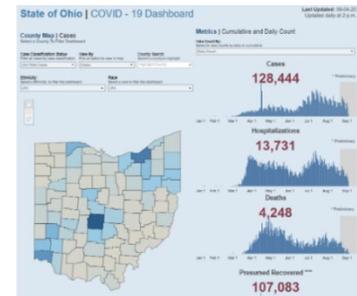
Capabilities developed and lessons learned from the work of TDAI faculty with our community partners informed current work with the university to ensure safe return of students, faculty and staff to campus. At the University, TDAI faculty are engaged in the COVID-19 Comprehensive Monitoring Team (CMT), a team comprised of OSU public health and infectious disease experts, data scientists, and analysts that make data-informed recommendations for action to university administrators. The CMT has established a surveillance testing program for students which involves mandatory weekly testing of all students who live in residence halls or university-managed housing; regular testing of random samples from asymptomatic undergraduate students who live off campus; voluntary testing of asymptomatic faculty, staff, and graduate and professional students; testing of any symptomatic individuals; and targeted testing if COVID-19 hot spots are identified. In total, the CMT integrates data from more than 30 different sources across campus and the medical center and provides on-demand data analytics. **The COVID CMT is an exemplar for standing up massive, interdisciplinary, data-driven projects and documenting the resources, gaps, and workflows.**
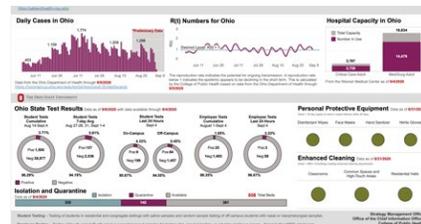
Educational Programming & Workforce Development: It is well-known that there is a dearth of talent in the job market for skills in data science and analytics (DSA). Moreover, employers have recognized the long-standing need for a *diverse workforce* to increase team productivity and, in turn, their bottom lines. TDAI was asked to lead the university effort in expanding the DSA talent pipeline; however, the challenge is that TDAI is not an academic degree granting unit. TDAI's efforts in education are epitomized by the development of an employer-responsive, comprehensive and diverse DSA talent pipeline, a pipeline that spans from secondary school learners to working professionals and beyond.

Summer Camp for HS URMs	UG Industry Internship Program	Curriculum in Data Ethics & Bias	Interdisciplinary Capstones	Master's in Translational Data Analyitcs	AI in Healthcare Certificate

- ***Secondary School Learners***: This year the 3rd annual TDAI Data Science for Women Summer Camp for minority high school students was held for the first time virtually. The camp has served more than 80 students (73% of whom are women of color) from 27 middle and high schools in central Ohio.
- ***Undergraduate Students***:
  - This year TDAI launched a novel Industry Internship Program, the first of its kind for the university.
  - TDAI piloted several interdisciplinary capstone courses: Computational Social Sciences; Interdisciplinary Research in Computer Science & Engineering; and Data & Technology: Engineering a Just Future. The capstones will be expanded to other departments in the future.
- ***Graduate Students and Working Professionals:***
  - In Fall 2020 TDAI launched a Master's degree in Translational Data Analytics, a program designed in collaboration with employers to upskill and reskill transitioning and incumbent workforces.
  - Along with OSU's NIH-funded Center for Clinical and Translational Science, TDAI is currently planning a graduate certificate focused on AI in Healthcare.
  - This year TDAI launched a Data Literacy Program of training workshops for the OSU community.
- ***Post-Graduate Trainees:***
  - We are developing a fellows program that provides training opportunities for postdoctoral scientists. In addition to research, fellows will be trained and will provide DSA consulting and training services to the broader OSU community, building data analytics services infrastructure in TDAI.
  - TDAI awarded a pilot grant to develop courses in data ethics & bias to incorporate into the curriculum for OSU's Data Analytics undergraduate major and other majors across campus. This work will be supported by a to-be-hired TDAI post-doctoral fellow with expertise in Race and Responsible Data.

CHALLENGES:

Faculty Engagement: As at many other institutes, faculty engagement tends to be a challenge given competing demands on time and the breadth of faculty needs in DSA, as well as lack of clarity in what it means to "engage". TDAI has implemented a few approaches that have proven successful.

- ***"Pick 3"***: TDAI provides opportunities for faculty to lead and/or engage in programming activities that align with their career goals and personal passions. We recommend they select 3 options annually ("pick 3") for engagement out of a variety of choices (e.g., hosting a speaker, teaming on research).
- ***Team Science***: TDAI invests in promoting faculty-initiated team science via grants, as well as in staff who collaborate with faculty to develop and execute win strategies for extramural funding opportunities and follow-up with post-grant award.
- ***Leadership Opportunities:*** TDAI provides leadership opportunities for faculty (1) to co-direct communities of practice in specific domains/challenge areas (e.g., computational health and life sciences; foundations of data science and AI; responsible data science; computational social sciences; smart/connected communities and distributed sensing); and (2) to lead *ad hoc* working groups.
- ***Labs-in-Residence***: Faculty-led research teams become short-term (1-2 year) residents of Pomerene Hall and are showcased during meetings with external partners and potential donors.

Campus Data Infrastructure: There is an urgent need for campus-wide integrated infrastructure for data-generating and data-enabled research, connecting cyberinfrastructure, information services, and data analytics. Currently, the Office of the Chief Information Officer (OCIO) manages IT needs and university operations-related analytics needs, leaving a gap in research-specific needs of all OSU faculty. TDAI has partnered with the university's recently formed Research Cyberinfrastructure and Advanced Computing Advisory Board to begin to address these data research needs. We are using COVID-19 CMT as an exemplar and hiring a data scientist to support the broader effort of developing data infrastructure at OSU.

Interdisciplinary Research Training and Advocacy: Support and credit for interdisciplinary research in promotion and tenure process remains a cultural challenge. The Office of the Provost is communicating and providing training to deans, chairs, and promotion and tenure committees. TDAI is starting a mentoring program and a series of workshops specific to building an interdisciplinary career in academia.