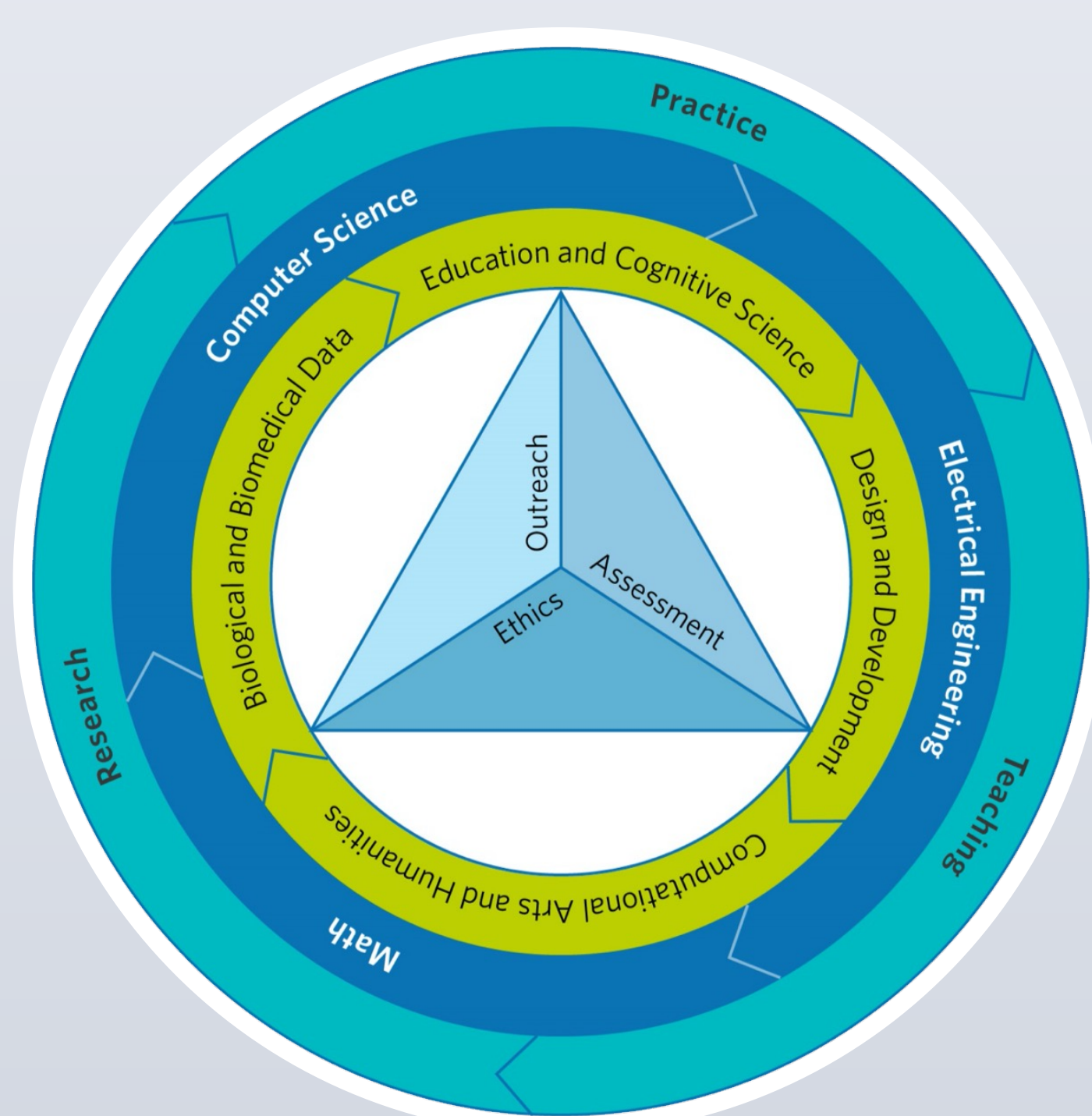# T- TRIPODS
Supporting the Foundation of a Data Intensive Study Center

OVERVIEW

Tufts University T-TRIPODS Phase I Institute supports a culture of interdisciplinary research and learning in data sciences across multiple departments, fostering collaboration among mathematicians, computer scientists, and electrical engineers, as well as scientists and scholars in a wide range of application domains.
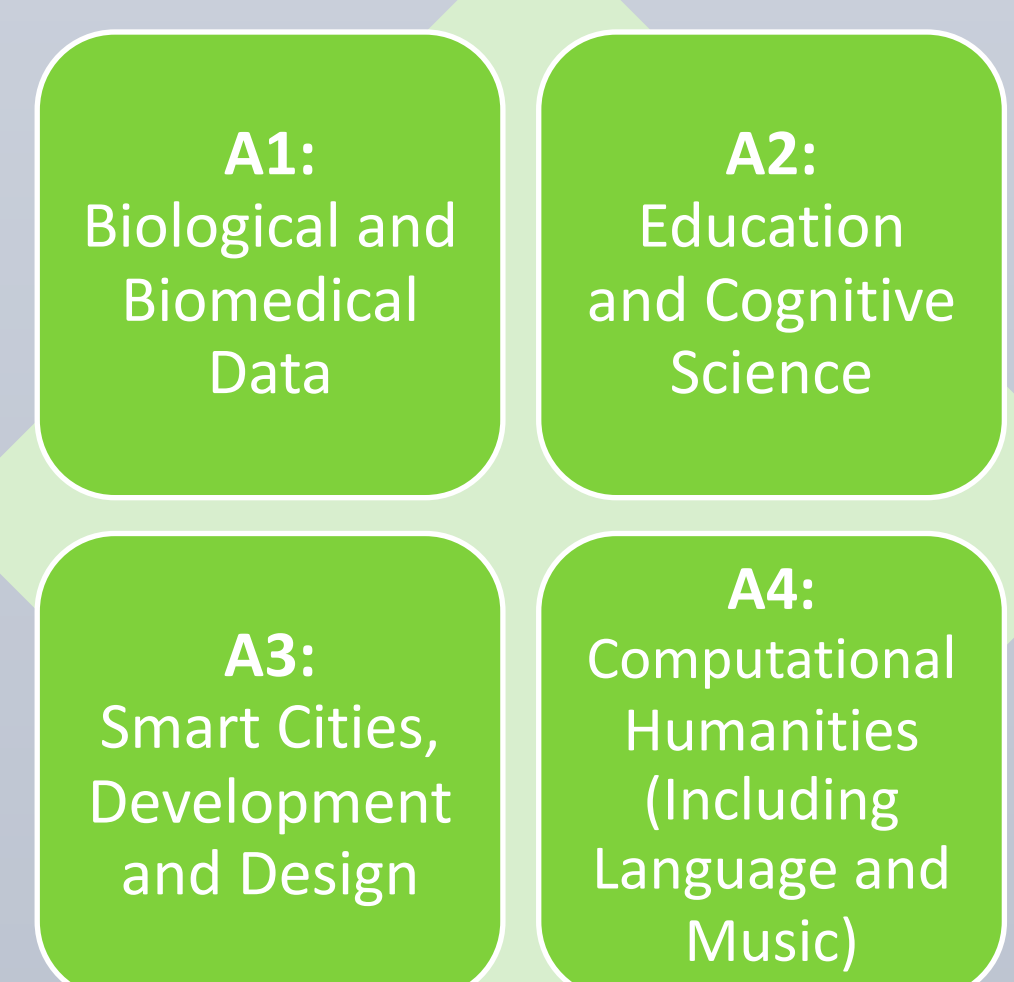
INSTITUTE STRUCTURE

Many TRIPODS support the Tufts Data Intensive Studies Center (DISC): The structure of T-TRIPODS fosters specific and deep connections with applications domain experts in several areas, leading to translational research. Teaching and curriculum development efforts at the undergraduate, graduate, and professional levels complement the research effort.

The Four Application Areas:

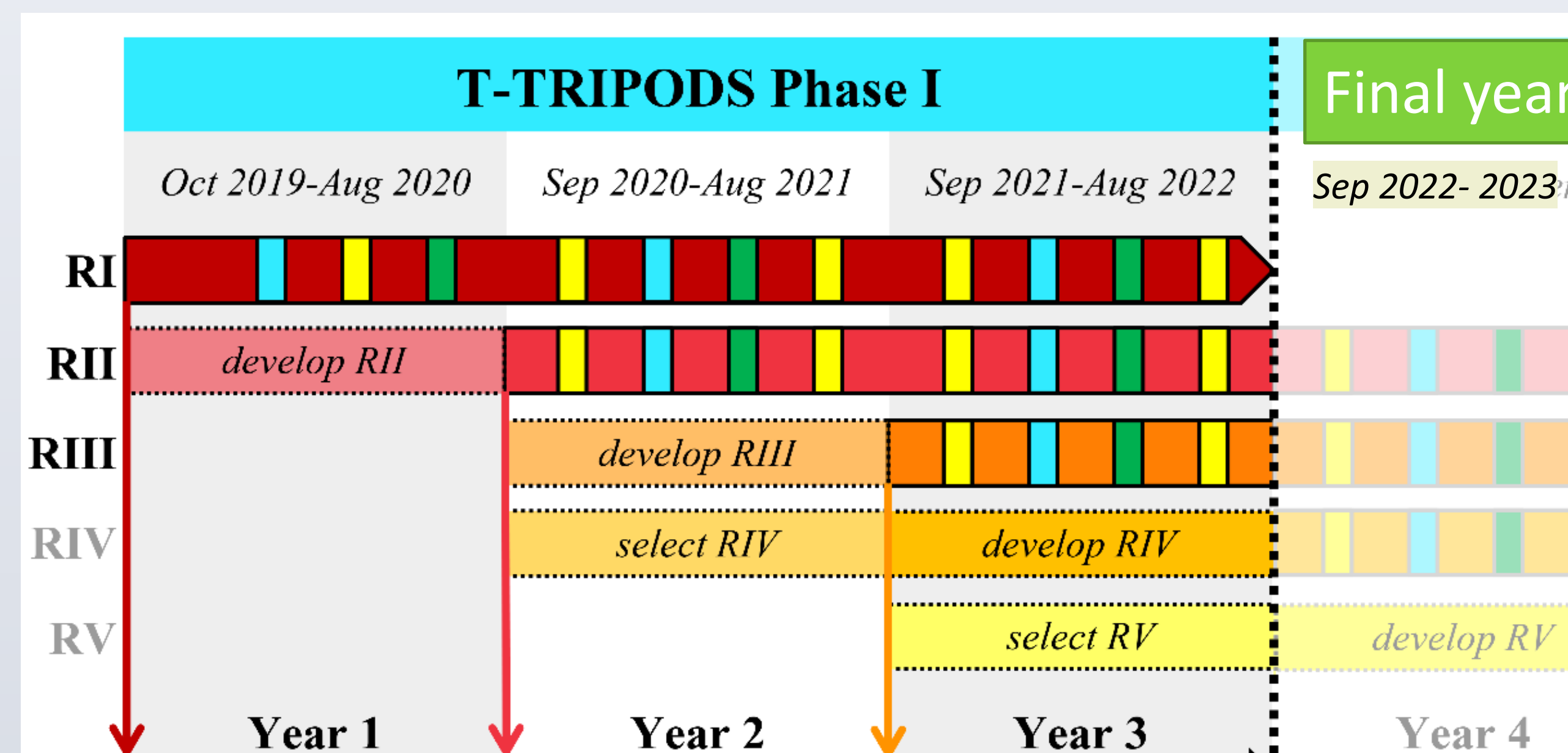25 Tufts faculty spread throughout the university are domain expert T-Tripods Afiliates

A1: Biological and Biomedical Data

A2: Education and Cognitive Science

A3: Smart Cities, Development and Design

A4: Computational Humanities (Including Language and Music)

ACKNOWLEDGEMENTS

FOCUSED RESEARCH TOPICS

The model is built around overlapping, three-year research topics with an offset timeline. Each year, the oldest research topic sunsets while a new research topic is added. For each focused research topic, T-TRIPODS convenes interdisciplinary teams of computer scientists, electrical engineers, mathematicians, and statisticians to address timely questions and solve important problems at the frontiers of data science. 21 Tufts faculty working in data science foundations spread over the three core departments are T-TRIPODS affiliates.

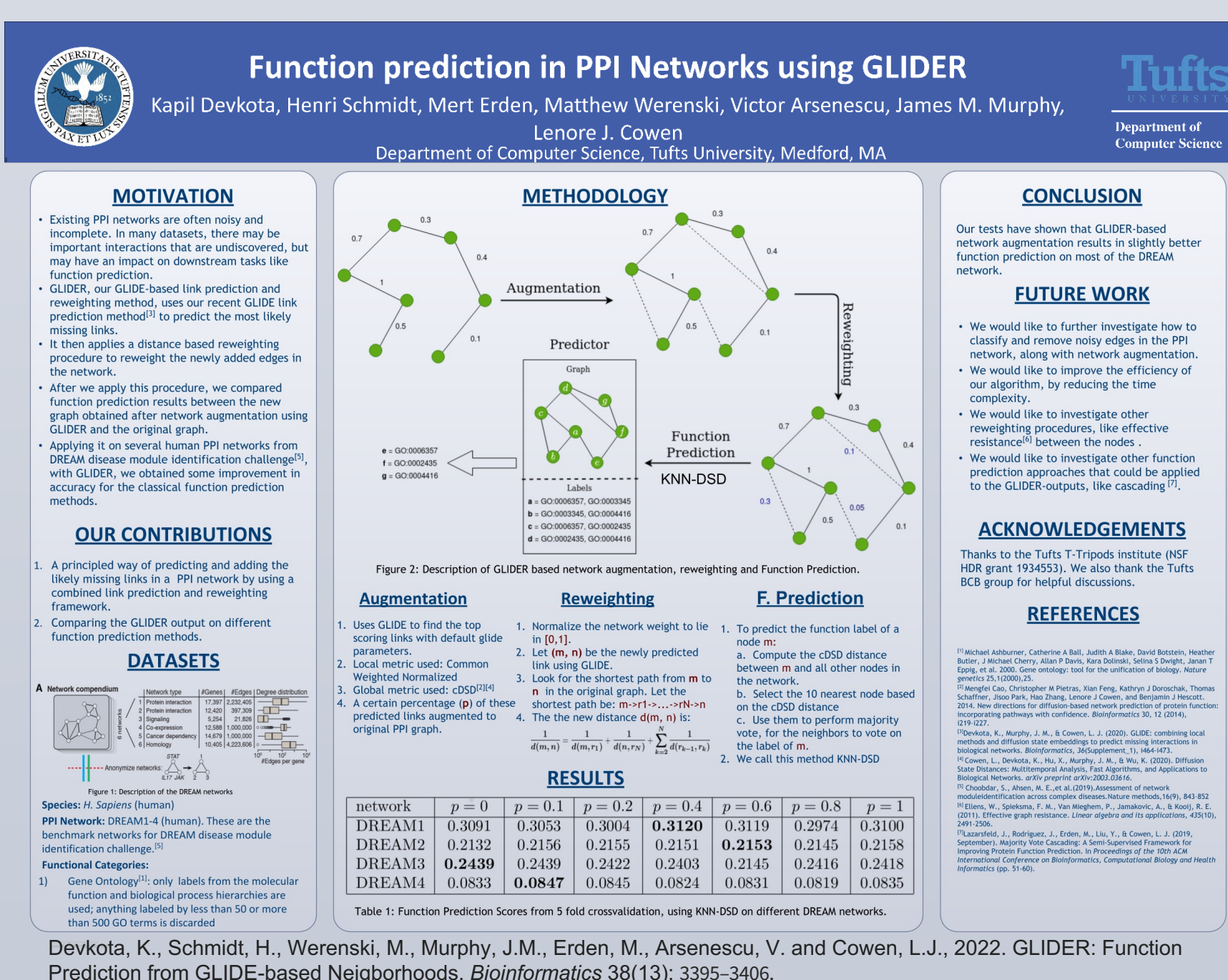R1: Graphs and tensor data representations (2019-2022)

R2: Learning from data with Spatio-temporal aspects (2020-2023)

R3: Data Guarantees: data quality, fairness, transparency, privacy, and trust (2021-2023)

T-TRIPODS Phase I

	Oct 2019-Aug 2020	Sep 2020-Aug 2021	Sep 2021-Aug 2022	Final year Sep 2022- 2023
RI				
RII	develop RII			
RIII		develop RIII		
RIV		select RIV	develop RIV	
RV			select RV	develop RV

Year 1 | Year 2 | Year 3 | Year 4

R1/R2 so far: 30+ publications

Function prediction in PPI Networks using GLIDER
Kapil Devkota, Henri Schmidt, Mert Erden, Matthew Werenski, Victor Arsenescu, James M. Murphy, Lenore J. Cowen
Department of Computer Science, Tufts University, Medford, MA

Devkota, K., Schmidt, H., Werenski, M., Murphy, J.M., Erden, M., Arsenescu, V. and Cowen, L.J., 2022. GLIDER: Function Prediction from GLIDE-based Neigborhoods. *Bioinformatics* 38(13): 3395-3406.
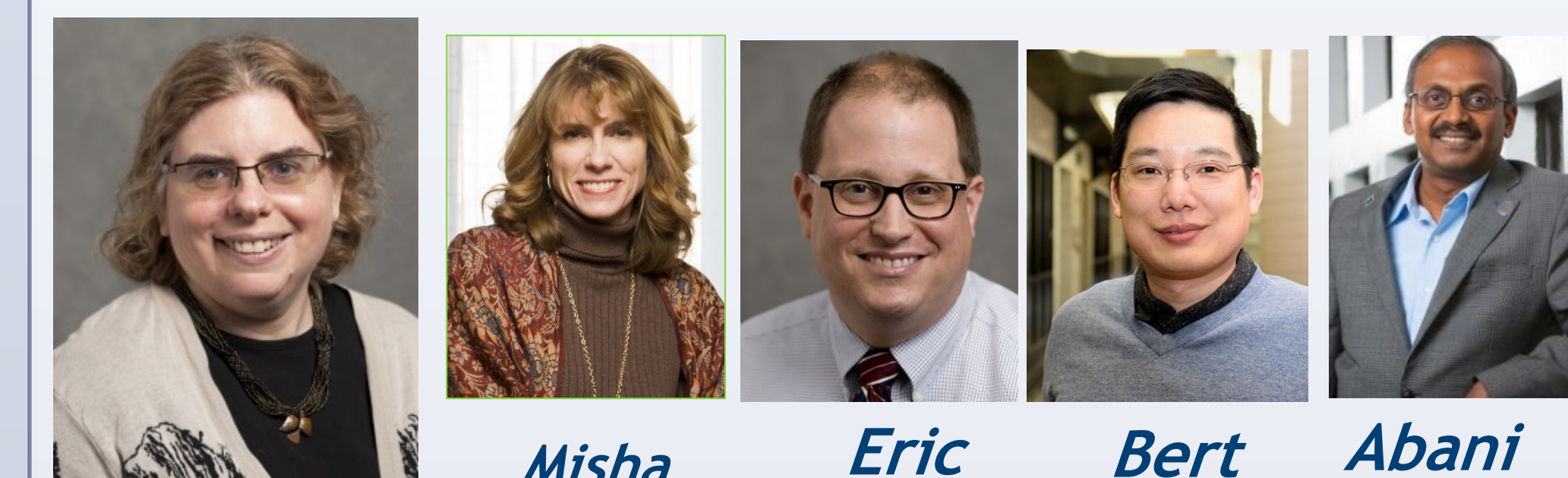
Ethics Case Studies Project

T-TRIPODS ethics subcommittee is working on a project to design ethics case studies for use in undergraduate CS and data science classes. Short case studies are paired with expert opinions. Initial set of 8-10 case studies will be published in May 2023. More info/how to contribute linked off the "Ethics" tab of the T-Tripods website.

R3 Programming in 2022:

- Colloquium series: Making real-world data science responsible data science;

- 2-day virtual workshop on Understanding Misinformation and Disinformation

- New seminar series and working group in 2022-2023 focused on FAIR data and metadata: best practices.

https://tripods.tufts.edu
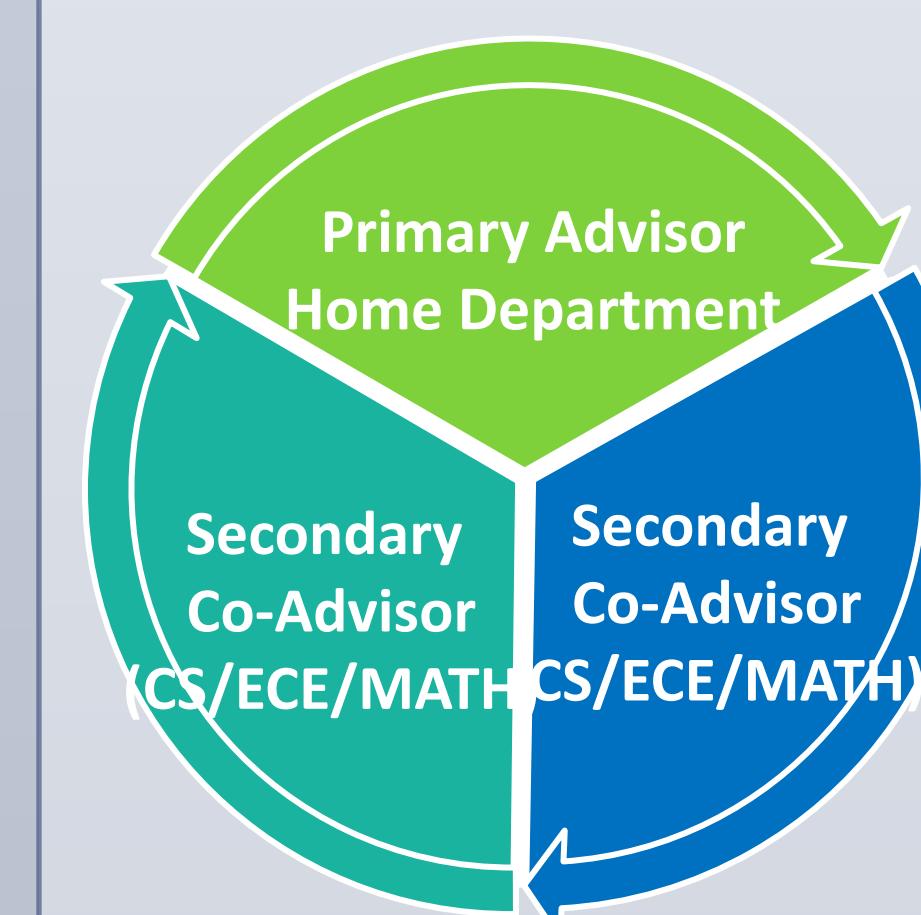
LEADERSHIP TEAM

Lenore Cowen
T-TRIPODS Director (CS & MATH)

Misha Kilmer (MATH)

Eric Miller (ECE)

Bert Huang (CS)

Abani Patra DISC Director (CS & MATH)

TRIPODS GRADUATE FELLOWS

Primary Advisor Home Department

Secondary Co-Advisor CS/ECE/MATH

Secondary Co-Advisor CS/ECE/MATH

The centerpiece of our Ph.D. advising model is the Advising Trio: T-TRIPODS Graduate Fellows from CS/ECE/MATH have a primary research advisor in their own department. As T-TRIPODS Fellows, they are also assigned co-advisors in the other two departments.

DATA SCIENCE FOR ALL

Undergraduate Summer Research Opportunities in Data Science

T-Tripods founded DIAMONDS with the goal of Broadening participation in data science.

DIAMONDS stands for Directed, Intensive and Measured Opportunities In Data Science and is aimed at broadening participation in data science, especially for groups historically under-represented in STEM. This is a program of The Center for STEM Diversity at Tufts University.

T-TRIPODS
DIAMONDS