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News Release

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UM's IDSC Joins Global Cyberinfrastructure Network as a Scientific Partner

Collaboration with Brazilian researchers will focus on sharing datasets in real time for improved weather and climate change predictions

The University of Miami's Institute for Data Science and Computing (IDSC) has joined FABRIC, the advanced U.S. cyberinfrastructure network funded by the National Science Foundation (NSF), as a scientific partner. A three-year research award to UM was included in a $3 million NSF grant that will expand FABRIC to four leading scientific institutions in Asia and Europe, and support international research that benefits from real-time sharing of large-scale datasets.

"We look forward to collaborating with our colleagues at Brazil's Center for Weather Forecast and Climatic Studies (CPTEC) to improve our weather and climate models and predictions," said Ben Kirtman, IDSC deputy director, and professor of atmospheric sciences and director of the Cooperative Institute for Marine & Atmospheric Studies (CIMAS) at the Rosenstiel School for Marine and Atmospheric Science.

The UM-Brazil weather project is one of five scientific use cases designed to test and validate the high-speed FABRIC infrastructure. "Our teams at IDSC and CPTEC will serve as pilot customers for the FABRIC network," said Kirtman, who is principal investigator for the $210,000 NSF award. "Our collaboration can help assess the ability of this powerful cyber infrastructure to support the fast and furious exchange of data and identify any potential issues."

From a scientific standpoint, the collaborative project will help researchers in both countries understand how air-sea interactions along the Gulf Stream and Brazil Current can affect sub-seasonal weather forecasts and seasonal climate predictions. Rather than ship large datasets back and forth between the U.S. and Brazil, we will now have the ability to analyze the data on demand, an efficient, time-saving process.

Kirtman added that science is fast outgrowing the capabilities of today's Internet infrastructure. To fully capitalize on big data, artificial intelligence, advanced computation, and the Internet of Things requires robust, interconnected computers, storage, networks, and software.

FABRIC, launched in 2019 with a $20 million grant from NSF, is building a cyberinfrastructure platform where computer scientists can reimagine the Internet and test new ways to store, compute, and move data. With the new $3 million NSF grant, FABRIC Across Borders (FAB) will link FABRIC's nationwide infrastructure to nodes in Japan, Switzerland, the U.K., and the Netherlands.

"FAB allows collaborative international science projects to experiment with ways to do their science more efficiently," said FAB principal investigator Anita Nikolich, director of technology innovation at the University of Illinois School of Information Sciences. "Being able to put FABRIC nodes in physically distant places allows us to experiment with the infrastructure to support new capabilities and also bring disparate communities together."

To ensure the project meets the needs of the scientists it aims to serve, FAB will be built around use cases led by scientific partners in weather and climate prediction, as well as four other areas:

• Physics (high energy physics use cases)
• Space (astronomy and cosmology use cases)
• Smart cities (sensing and computing use cases to advance smart, connected communities)
• Computer science (use cases in private 5G networks; censorship evasion; network competition and sharing; and software-defined networking and P4 programming)

FAB will connect with existing U.S. and international cyberinfrastructure testbeds and bring programmable networking hardware, storage, computers, and software into one interconnected system. All software associated with FAB will be open source and posted in a publicly available repository: https://github.com/fabric-testbed/.

About the University of Miami Institute for Data Science and Computing

The University of Miami is one of the largest private academic and research institutions in the southeastern United States. The University's mission is to transform lives through education, research, innovation, and service. Drawing on the multidisciplinary resources of the University of Miami, the Institute for Data Science and Computing (IDSC) is dedicated to solving pressing societal challenges by empowering data science research, education, ethics, community engagement and commercial ventures. The institute is organized around research programs that focus on key areas of societal need, including Atmosphere, Ocean and Earth Science; Data Driven Discovery in Biological Sciences and Health Care; and Urban Lab and Smart Cities. For more information, visit idsc.miami.edu. Follow us on Twitter @UMIDSC