Synergistic Activities - Mateo Díaz (JHU)

The PIs are actively engaged in several activities that synergistically integrate research, education, and outreach, enhancing the broader impact of their scholarly work:

WISE Program Mentorship. In the summer of 2025, PI Díaz will participate in the Whiting Internships in Science and Engineering (WISE) program. The PI will mentor high school students from Baltimore City Public Schools. This annual engagement introduces young minds to real-world applications of optimization, such as imaging inverse problems and transportation planning, inspiring the next generation of STEM professionals.

Curriculum Development. In Fall 2024, the PI developed a novel undergraduate class at Johns Hopkins University titled "Mathematics of Origami." This class introduces freshman students to geometric and design principles through the art of paper folding. By exploring the mathematical foundations of origami, students engage with concepts in geometry, topology, and algorithmic thinking. The course emphasizes hands-on learning and creative problem-solving, fostering an appreciation for how mathematical theory can inform and enhance practical design.

DeepMath Conference Organization. PIs Díaz is involved in organizing DeepMath, a conference dedicated to exploring the mathematical foundations of deep learning. This activity facilitates the exchange of ideas at the intersection of mathematics and machine learning, contributing to the advancement of both fields.

Open-Source Algorithm Implementation. As a direct product of his research, the PIs and their students have produced code implementing the methods in their research. This provides students with hands-on experience and crystallizes the theoretical concepts developed while making advanced algorithms accessible to a broad audience of practitioners and researchers worldwide.

Colombian Optimization Workshop. As one of the organizers of the biennial "Optimization Workshop: Theory, Algorithms, and Applications" in Colombia, PI Díaz fosters international collaboration and knowledge transfer. This workshop, featuring introductory classes and talks by leading researchers, bridges the gap between Latin America and the United States in optimization research, promoting diversity in STEM and unlocking untapped talent. PI Díaz and his graduate students will present research talks and posters at this event.

These activities demonstrate the PIs commitment to creating, integrating, and transferring knowledge across various domains and communities, amplifying the impact of his research beyond academia and fostering a diverse, well-prepared workforce in optimization and data science.