T10 - GeoSAT: Fearless on Every Spatial Front

The Center for Geospatial Sciences, Applications, and Technology (GeoSAT) at Texas A&M University is dedicated to fostering excellence in research, education, and outreach through the innovative development and application of geospatial technology. GeoSAT's mission is to advance interdisciplinary scientific inquiry, enhance experiential and conceptual learning, and promote technology transfer and capacity building. Through its integration of cutting-edge geospatial technologies, GeoSAT tackles some of the most pressing issues of our time, from infrastructure resilience and climate change to social justice and community perceptions, showcasing the intersection of technology, policy, and human behavior in shaping sustainable and livable cities. GeoSAT's research focuses on the dynamic interplay between computational social science, urban data science, and geospatial artificial intelligence (GeoAI), applying these tools to a variety of real-world challenges. One of its key research areas is urban digital twins and precision public health, where the center emphasizes real-time 3D modeling and AI-enabled participatory planning. This work supports the creation of more efficient and resilient urban environments by offering decision-makers powerful tools to visualize and simulate urban systems. Urban climate science is another core research focus, with particular attention to downscaling climate data to the scale of the built environment and examining how these changes impact human mobility. GeoSAT envisions the convergence of computing and geospatial science, embodied in its "urban informatics+" initiative. This initiative aims to integrate human-centered urban and regional science research across disciplines, creating a holistic approach to understanding and improving urban systems. The center is also a leader in the development of digital twins and virtual/augmented reality (VR/AR) technologies, enabling multi-scale simulations and real-time analysis of built environments. These tools allow for the testing of sustainable growth and climate action scenarios, offering innovative solutions to the challenges of urban planning in the face of climate change. The center's efforts are supported by a diverse team of 55 faculty members spanning 16 colleges at Texas A&M University, including the Galveston campus, Texas A&M Engineering Experiment Station, AgriLife Research, and the Texas A&M Transportation Institute. This collaborative network strengthens GeoSAT's ability to drive impactful, interdisciplinary research and solidifies its role as a hub for geospatial science and technology innovation.