



COLLOQUIUM

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Benefits of Simplification, Compression, and Reconstruction of 3D Objects using Chain Codes and Helical Paths

Friday March 31st at 2:30pm in RT 1516

Bio: Oswaldo A. Tapia Dueñas is a Ph.D. candidate, currently in his last semester, and his research focuses on developing innovative algorithms and techniques for the compression, simplification, and reconstruction of 3D objects. He applies these algorithms in medical images to create efficient solutions for the representation and manipulation of 3D models. His work in computer vision has the potential to significantly enhance the field of medical imaging by creating more efficient and effective methods for analyzing 3D medical images. He is passionate about using his research to contribute to the development of better tools for medical professionals to diagnose and treat patients. In addition to his research, he works as a part-time professor at the Department of Electrical & Computer Engineering at CSU. He teaches courses in Introduction to Programming and System Programming, providing students with a strong foundation in programming concepts and tools.

Abstract: This presentation will explore the application of chain codes and helical paths in compression and simplification techniques for 3D objects and medical images. In the first part, we will explore the compression of medical images using chain codes to encode contour information into sequential codes and helical paths to order the resulting chain codes. In the second part, we will discuss the use of chain codes to compress 3D objects and context-free grammar to reduce the amount of information even more to obtain a simplified point cloud. We will also explore the application of helical paths in simplifying point clouds of 3D objects by ordering them in regions that compose the shape. Finally, we will present a method to reconstruct the 3D mesh from the simplified point cloud. This presentation will provide insights into the implementation and benefits of chain codes and helical paths in compression and simplification techniques for various applications.

Refreshments will be served in RT 1517 at 2:10pm