Structural plans are the standard source of data for finite element analysis modeling within engineering. Point cloud technology has developed as a tool at the disposal of several fields of study. For this thesis, a study was completed on two different structures on the University of Central Florida Orlando campus through the use of both structural plans and point cloud technology. The results sought to understand the viability of point cloud technology as a substitute to structural plans through static and dynamic modal analysis. For static analysis, a portion of the framing of Spectrum Stadium was rendered, modeled, analyzed and compared to a previous case study. The results emphasized how different users can render dissimilar member sizes and lengths due to human judgment on point cloud visuals. Depending on which structural aspect is being looked at, the outcomes produced both more and less accurate results further indicating the role human judgment plays when using this technology. For dynamic modal analysis, a pedestrian bridge was scanned, rendered, modeled and analyzed. The point cloud produced from scanning the bridge was modified twice in order to have three distinct point clouds with varying densities: fine, medium and coarse. These three cases were compared to structural plans and experimental data to discover how lessening the density of point clouds affect the accuracy of results. The analysis showed that point clouds can give you fairly accurate results when compared to structural plans. Also, lowering the density was found to only slightly change accuracy as the numeric values stayed within a close proximity when compared. This thesis shines a light on the feasibility and potential point cloud has within engineering. As the technology continues to grow, time may have it become one of the premier tools for the analysis of structures.

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The public is welcome to attend.