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FEATool: A Student-Friendly Option for Finite Element Analysis

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Finite element analysis (FEA) is a numerical method that has applications in many different engineering disciplines including stress analysis, heat transfer, mass transfer, fluid flow and electromagnetics. In this project, use of the FEATool software package for stress analysis is explored. Modeling results include stresses, strains, and displacements, each of which can be reported separately in the x and y directions. In a specific example, FEA results are applied to compare theoretical modeling results to values discovered through experimentation.

For engineering students, use of FEA software often requires navigating complex modeling steps, both in terms of creating models and extracting useful information from the results. Much of the commercially available FEA software is complicated to use and pose a steep learning curve for students with little prior experience. A recently developed software, FEATool, provides accurate analysis while breaking down the analysis into very simple steps that help students to better understand the process and importance of FEA. Due to its ability to model a variety of field problems, FEATool can be used in a variety of engineering courses.

This poster includes an overview of FEATool, an example of how FEATool was used to model biaxial tension sample geometries, and ways students and teachers can use FEATool in their engineering classes, coursework, design projects and research studies.

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