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Application of topology optimization in student competitions

Modern structural optimization methods have seen significant advances in recent years such that they can now be incorporated into the design phase of student competitions. The overall objective of this project is to develop an optimization-based approach for future Mizzou Formula SAE car chassis designs. Solid modeling software is used to define the design space for structural components and topology optimization is used to compute optimal frame configurations. Loading conditions typical of race car design are included. The optimization seeks to minimize weight and increase chassis strength while accounting for pre-existing components that are not part of the design space. This study provides a foundation for utilizing modern structural optimization methods in the design of future Mizzou Formula SAE cars.