

Industrial Design

INDUSTRIAL DESIGN

Learning from Trees and Bones How to Optimize Strength and Materials

The next time you drive through a forest, go ahead and thank the trees out your window for helping on your car's crash safety and gas mileage. Trees engineer themselves in a number of ways to maximize their strength, such as arranging their fibers to minimize stress and adding material where strength is needed (take a look at the extra material beneath a heavy branch, for instance). Bones — unlike trees in that they must carry moving loads — go a step further by removing material where it's not needed, optimizing their structure for their dynamic workloads. Engineers have incorporated these and other lessons learned from how trees and bones optimize their strength and minimize their use of materials into software design programs, such as Claus Mattheck's "Soft Kill Option" software, which are revolutionizing industrial design. Using these programs to design cars, for example, has resulted in new vehicle designs that are as crash-safe as conventional cars, yet up to 30% lighter.