Engineering Design and Optimization Group (EDOG)- Research Overview

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The Engineering Design and Optimization Group (EDOG) is a mechanical engineering research group that couples advanced manufacturing techniques and design principles with unique material characteristics to support an array of biomedical and structural projects. A key throughline of EDOG research is the use of additive manufacturing to produce bulk properties like mechanical compliance, which is only possible with careful materials selection, modeling, and characterization. Topics falling under biomedical applications include magneto-active elastomers to produce self-expandable stents, wear-resistant and flexible metal orthopedic implants, and dissolvable metal implants. Projects with structural focuses include dampening elements to control surface wave propagation, hyperelastic hinges for soft robotics, and optimized aerospace components based on advanced materials characterization.