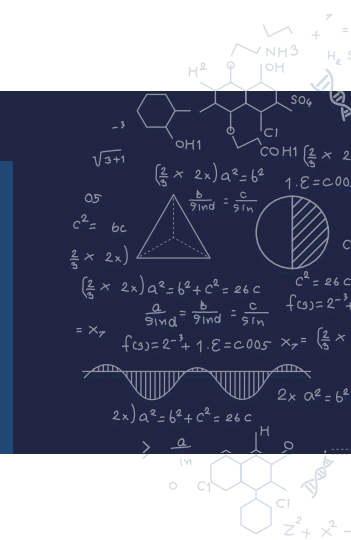# LICENSING OPPORTUNITY:
INVERSE DESIGN MACHINE AND MAKING A DESIGNER IMPACT-MITIGATING ARCHITECTURED ISOTROPIC STRUCTURE

DESCRIPTION

Problem

Current approaches to designing impact mitigating materials are primarily based on trial and error discovery rather than a systematic inverse design approach.

Invention

This invention is a tool that can design structured materials with a desired set of mechanical properties arising from an aperiodic arrangement of elastic elements for impact mitigation applications. You input a desired mechanical response for the final structure and algorithm that drives to tool automatically adjusts the arrangement of elements of the structure to achieve the final desired properties. The structural design is then fed to a additive or subtractive manufacturing tool, such as a 3D printer, that creates a physical structure with the desired properties.

BENEFITS

Commercial Application

Commercially viable tool to design impact mitigating materials for sporting and protective equipment. This algorithm enables the inverse design of structured materials with mechanical properties that are difficult to achieve with monolithic materials. It is a new approach to creating materials using structural elements whose size-scales can span from meters to nanometers.

Competitive Advantage

This inverse design engine generates disordered structures that are unlike architectured materials having a periodic structure and thus possessing anisotropic mechanical properties. The products from this design engine can generate structures with isotropic mechanical properties that are specific to the requirements of a particular impact mitigation application.
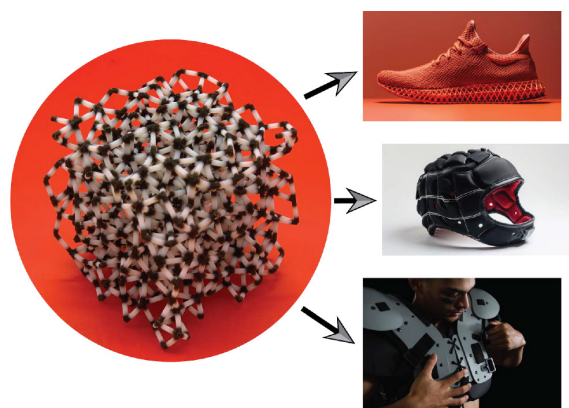
Potential applications for impact mitigation.

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