connected everything.

Developing the future of adaptive materials based on HD-reprogammable matter

Project Team:

Dr Adam Blaney
(Architecture)

Dr John Hardy
(Chemistry)

Dr Mark Ashton
(Chemistry)

Research Assistant Role
TBD

The project team and timeframe

The feasibility study is comprised of four investigators from various disciplines (design/architecture and chemistry) from Lancaster University: Dr Adam Blaney, Dr John Hardy, Dr Mark Ashton. The projects Research Associate is yet to be appointed. We are working in partnership with Benjanim Barlow, in a consultantation role from Zelus Sports. The project begis on October 1st 2021 and will be completed by April 1st 2022.

What does the project demonstrate?

The project is investigating the future of adaptive sportsware/fashion by developing a fabric swatch that can have multiple material properties reprogrammed at high-resolutions and self-healed when damaged. The project will demonstrate the feasibility to upload design information/real-time data into physical products/fabric swatches at high resolutions, so various aesthetics, performance, functional properties can be updated and self-heald on demand. In doings so, highly beskope garments/products and new forms of creativity could be possible as well as material waste being significantly could be reduced.

Adaptive sportswear

Currently, digital models can have have multiple properties (shape, size, colour, composition etc) infinitealy adapted in real-time and at high resolutions if they remain in their digital software. However, these adaptive abilities are lost when they are fabricated. This results in significant material waste as products can not self-heal when damaged or be updated to meet fluctuating design demands.
This project aims to instill adaptive abilities at high material resolutions present within biology into artificial physical wearables/structures. This could lead to self-healing and highly customizable products as well as, cities that behave like living material ecosystems capable of sharing resources.

UKRI Engineering and Physical Sciences Research Council

Preliminary Tests

Preliminary ferro-wax structure that can be melted and reprogrammed to change shape and self-heal via a multi-stimuli system.

Video links:
https://vimeo.com/user12085005
or scan QR code