

## Valency : Participant Information

## Adam Blaney



AdamBlaney. Still from movie of ferrofluid. 2023

## About the Research

The Developing HD-re-programmable matter project is a 6-month feasibility study project funded by Connected Everything ii, starting in October. The aim of the project is to prototype physically adaptive material samples that highlight the potential trajectory for the future of sportswear. The project opens up an exciting collaboration between Design and Chemistry at Lancaster and the project's industry consultant.

Currently, significant waste (financial, material, land) and pollution are generated from industrialised manufacturing and artificial materials because form is imposed upon materials/matter. As a result, our artificial objects, products, clothes and buildings can not physically adapt to fluctuating design demands, or, self-heal when damaged. Imagine instead, if we could physically adapt and update the materials that make-up our material world. This project will develop how matter can be reprogrammed to create physically adaptive materials for the future of sportswear. The 6-month project will be developed through iterative prototyping, in collaboration with Lancaster's material science institute, as a means to investigate the implications and opportunities of what it would mean if matter that can be reprogrammed at high-resolutions.

Led by Dr. Adam Blaney with his colleagues Dilan Ozkan and Dr. Mariana Fonseca Braga, this workshop will ask; What if materials could change and adapt to different conditions in response to the material crisis in the 21st century? For instance, what if athletes' clothes could change according to their needs in different circumstances (temperature, altitude etc.)? What if prosthetics could change to better adapt, providing bespoke comfort and performance? If we think on a larger scale, what if cities could grow and self-assemble like organisms? What if we could harness the use of bio-materials? What if building materials can self-heal? How do we deal with the unpredictable behaviour of living materials?

These are some of the futures encompassed by adaptive materials and the role of design[ers]. We are engaging academics working on developing new design methods for fields such as emerging technologies, bio-technologies, digital fabrication, HCI and data physicalisation. We are also involving people from the sports industry and health professionals to look through promising ways of evolving this field.

## About the Researcher

I am a researcher and a designer with a background in architecture. I joined Imagination Lancaster in January 2020. My research interest mainly focuses on rethinking and developing digital design and fabrication processes, through prototyping, that creates responsive, adaptive and self-healing objects, products and architectural structures. My ongoing work combines design, computation, hardware and chemistry to create radically new material abilities that explores the potentials of reprogrammable matter. Additionally, I am interested in documenting practice-based research in new and fun ways to enable a wider array of outputs. My work has been presented and published in a range of international conferences and journals.

This project explores the use of ferrofluid – a liquid material that responds to magnetic fields – as a basis for future state-changing materials and objects. The project aims to fundamentally re-think how materials might be interacted with, both during the fabrication and assembly process, but also with end-users when applied to products. We hope to demonstrate that materials can be grown or 'guided' using the concept of "tuneable environments" and imbued with adaptive capacities that are universally present with biological structures such as the ability to heal, adapt in real-time to stimulus, and even evolve as part of augmented ecologies and physical environments.

This videos in this exhibition demonstrates our first steps to control ferrofluid patterns via digital actuators. We will be posting more video updates soon so keep an eye out to follow our progress!



Images of ferrofluid experiments 2023



Images from the workshop



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