Master’s Pitches Elena

# Self-Proposed

## Collecting Accessible Heat Loss Data

The National Energy Action has estimated that approximately 6.5 million people in the UK were living in fuel poverty January 2024 (Hinson, Bolton, & Kennedy, 2024) following a hike in energy prices. Fuel poverty can cause or exacerbate respiratory, cardiovascular, thermoregulatory and mental health conditions (Lee, Sinha, Boyce, Allen, & Goldblatt, 2023), particularly within the lower socio-economic region. With this in mind, and with a drive to install new, sustainable heating alternatives to the condensing gas boiler (Energy Saving Trust, 2024), it is important to also identify which properties are subjected to the greatest levels of heat loss. Whilst generic data sets exist to predict the approximate rate of heat loss for homes of a certain age, size, number of occupants etc., there is nothing widely accessible and comprehensive that considers all these features. This project aims to build on current, unrefined processes for collecting the heat loss data across the UK and propose a platform whereby that data may be easily accessible to aid tackling the problem of fuel poverty.

### Visions for the Project

* Design a drone fitted with infrared cameras that addresses the problems of unreliable temperature readings (considering important features such as build quality, repairability, user interface etc.)
* Create a business case for the value of this technology (identifying houses with high levels of heat loss data earlier can prompt effective targeting to minimise spending/energy consumption – dynamic pricing model for renovations possibly)
* Incentivise people to collect their own heat loss data?
* Gamification of heat loss data collection from the homeowners

## Manufacturing Morphogenetic Structures

In the architectural space, there is a rising popularity in biologically inspired design, with a focus on morphogenetics. Software allows us to simulate biological growth patterns and create intricate texture patterns or models. Much like with generatively designed structures, at present the best way to manufacture these structures is trough additive manufacturing methods like 3D printing. However, with 3D printing there are often dimensional constraints. In this project, I aim to identify and evaluate new ways of constructing these complex bodies

* Swarm-robots inspired by termites designed to carve out structures (like small tunnel-boring machines)
* Smart dynamic casting with air pockets
* 3D printing robots capable of navigating in and out of weaving structures

## Questions for Elena

* Applications of morphogenetic structures

<https://bpro2022.bartlettarchucl.com/rc3-living-architecture-lab-22/diffusive-habitats>

* Possibility for modular structures that can be assembled into morphogenetic structures

# Elena’s Ideas

## Upcycling PVs through parametric Architecture

Upcycling photovoltaic (PV) panels through parametric architecture is an innovative approach to addressing the growing issue of solar panel waste while enhancing building design and energy efficiency. This concept involves repurposing end-of-life or damaged PV panels as building materials, integrating them into architectural designs using parametric modelling techniques. Parametric architecture allows for the creation of complex, customizable designs that can optimize the placement and orientation of upcycled PV panels to maximize energy generation and aesthetic appeal. This project is conducted in collaboration with IIS Bangalore and focuses on both the UK and Indian PV Panel Waste Stream, which will hit several million tonnes in the next 10 years. Creative and high-volume application for this waste stream is yet to be discovered- since the recycling infrastructure is not developed.

## Design Fiction for Automotive Foresight

### Introduction

Design Fiction serves as a powerful tool for fostering organizational change and shaping innovation strategies. This approach combines narrative storytelling with speculative prototyping to create plausible future scenarios. It enables companies to explore potential products, services, and societal shifts while driving internal transformation. By leveraging emerging AI tools, such as Large Language Models (LLMs) and Visual Engines, organizations can rapidly generate and visualize multiple design fictions. Each fiction presents a unique future context that challenges current organizational paradigms.

### Design Fiction as a Sub-Method of Speculative Design

As a sub-method of Speculative Design, Design Fiction acts as a springboard for innovation teams to ideate new products or services. Internally, it prompts critical discussions about the company's current structure, work policies, and cultural norms. By using Design Fiction in organizational design, employees at all levels are encouraged to engage with possible futures, fostering a shared vision and collective readiness for change.

### Objective

This project aims to investigate state-of-the-art foresight methods for Design Fiction to develop a new organizational platform for BMW. It seeks to audit existing structures for ideation and innovation and identify how to leverage these infrastructures to create an agile, AI-driven Design Fiction tool. This tool will foster a new method for generating innovation, shaping strategic conversations, and preparing for future shifts.

### Key Goals:

1. **Explore Design Fiction as a tool for innovation:** Use speculative design and narrative storytelling to drive the ideation of new products and services at BMW.
2. **Investigate AI-driven tools:** Leverage cutting-edge AI tools such as LLMs and Visual Engines to generate rapid design fictions that explore diverse future contexts.
3. **Audit existing innovation infrastructures:** Evaluate BMW's current structures for innovation and ideation to ensure they align with a new, agile Design Fiction-driven approach.
4. **Foster organizational transformation:** Use Design Fiction to challenge current paradigms, encourage critical internal discussions, and prepare employees for cultural and structural change.

### Impact

By integrating Design Fiction into BMW's innovation processes, the project will enable the organization to adopt an agile, forward-thinking approach. It will empower teams to imagine new futures, ideate transformative products and services, and collectively shape a shared vision for the company’s direction. Ultimately, this project will help BMW lead in innovation and strategic foresight, aligning the company with future trends and possibilities.

### Collaboration

This project is developed in collaboration with BMW and aims to shape the company’s organizational design through an advanced AI-driven approach to Design Fiction.

This formatting organizes the project details into clearly defined sections, providing a logical flow and highlighting the project's objectives, methods, and impact.