BITTERSWEET SHIRTS: Combining AI, digital printing & hand-making approaches to inform guidelines for circular, local & urban textile/clothing design processes

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POSTER ABSTRACT

Background Context. How can designers use AI, in combination with digital and handmaking processes, to create upcycled clothing for local, circular and urban contexts? This research builds on previous work which proposed early in the field of study, that designers needed to use technology as a supporting tool when making redesigned and remanufactured textiles and clothing (Earley 2010). This latest research for the Herewear Project[1], considers how new open-access artificial intelligence platforms (such as DALL-E) can support the design/redesign of processes and products for circular fashion, making the processes more time efficient, whilst retaining the aesthetic finish and connection that only hand-crafted techniques can deliver (Giri *et al* 2019). The research also considered how a sense of local identity and connection between users and waste clothing can be supported via the use of AI tools.

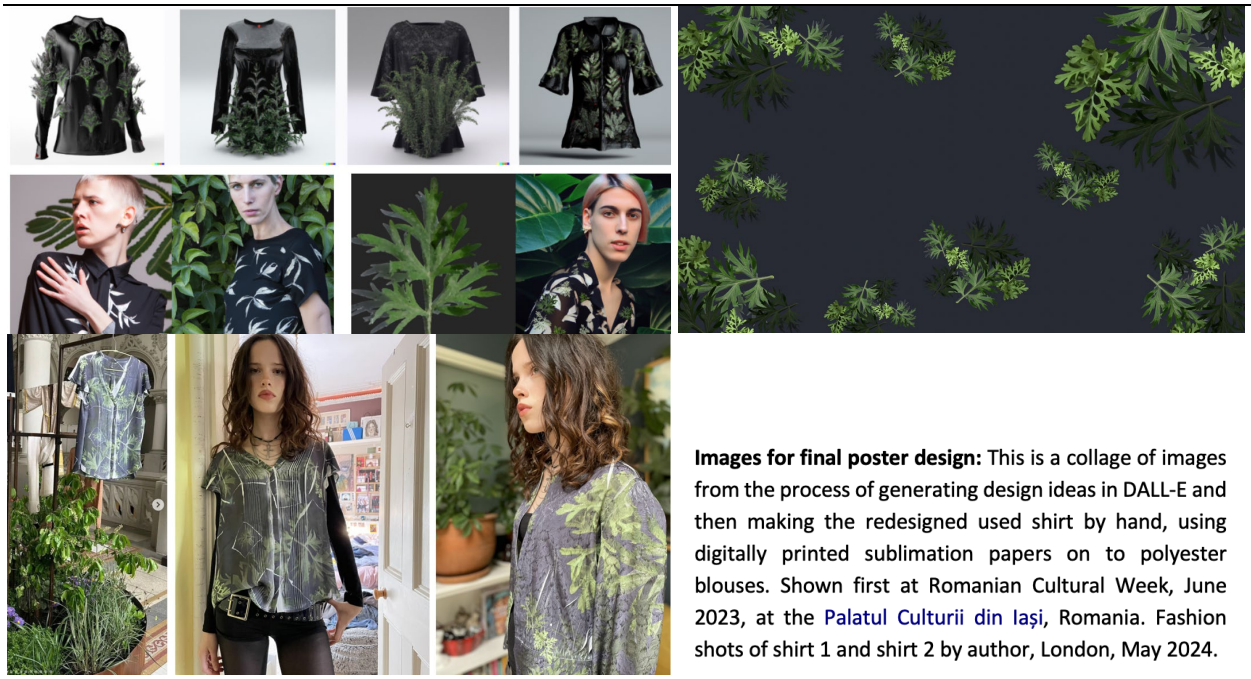
The author has been making 'upcycled' polyester shirts since 1999, with each shirt collection exploring different ideas about how designers can create a more sustainable, circular and equitable industry. Bittersweet Shirt (2023) has been re-crafted from a secondhand item to help people connect with nature in their region, and at the same time appreciate how our changing tastes make us waste clothes which can be transformed into something new and culturally relevant.

Bittersweet Shirt Concept. This research enabled the author to act as a fashion microbusiness and test the Herewear Project's Bio TEN guidelines (Earley & Forst 2023) and the approaches to extending life of biobased products (Earley *et al* 2023). For this design brief, a local connection was sought to users based in Iasi, Romania, which is where project partner Maibine is based. Wormwood grows in abundance in Romania and has long been used as a medicinal herb for cuts and bruises, to treat indigestion, help with fever and infections, and as a type of insect repellent. It is also used in the liquor absinthe and to flavour other drinks like Vermouth.

Research shows that the fashion and textile industry has already produced enough polyester to clothe the world population, if it were to be reused and recycled. Oil is mined for transportation fuel, and polyester and plastic are made from the cheap waste parts of crude oil, which are not of the quality required to make petroleum. As global economies transition away from fossil-based fuels, we need new bio-based textiles for fashion, that can replace synthetics in our wardrobe. However, we must also reuse what we have already made. In this research design guidelines that were being created for biobased clothing were further tested with used polyester shirts.

Bittersweet Shirt was made with multiple bittersweet elements in the brief: the paradox of polyester and waste; the health and alcohol drinking habits associated with the plant used as decoration on it; the impact of AI on design and cultural economies and practices; and the local and global dynamics of fashion in a time of great political, social and economic unrest.

[1] *This research is part of the Herewear Project, which focuses on new biobased materials made from agriwaste, that are made in local/regional networked manufacturing loops, which consider extended life approaches, alongside other considerations. Previous research by the author in this project has explored local making and remaking.* Link here



Images for final poster design: This is a collage of images from the process of generating design ideas in DALL-E and then making the redesigned used shirt by hand, using digitally printed sublimation papers on to polyester blouses. Shown first at Romanian Cultural Week, June 2023, at the Palatul Culturii din Iași, Romania. Fashion shots of shirt 1 and shirt 2 by author, London, May 2024.

BioTEN Insights

Bio TEN Strategy	Detail within Bittersweets Shirts Prototypes
1. Design for collaboration	Designing with DALL-E; the human designer working in collaboration with AI
2. Design for systems	Local remanufacturing loops keeps used products in circulation for longer
3. Design for communication	n/a
4. Design for recycling	Mono material garment ensures future polyester recycling process can be used
5. Design to minimize impacts	Low-impact overprint technique uses minimal energy/chemicals and zero water
6. Design to minimize waste	Redesigning with used clothing, tapping into an abundant local waste stream
7. Design for longevity	Emotional durability (local connection to plant); physical durability of polyester
8. Design for transformation	Multifunctional element of garments; styled as shirt or overshirt, or light jacket
9. Design for sharing	n/a
10. Design for upcycling	Redesign approach allows for further processes to be added, like embroidery

Next Steps. The key elements of the design development approach used here are currently being translated to use biobased deadstock materials for a final stage in the Herewear Project with Germany-based microbusiness partner Vretena. A shirtdress range will go on sale in Autumn/Winter 2024.

Acknowledgements

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