

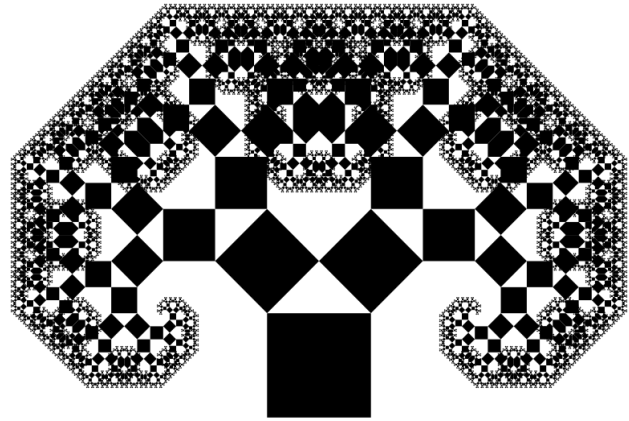
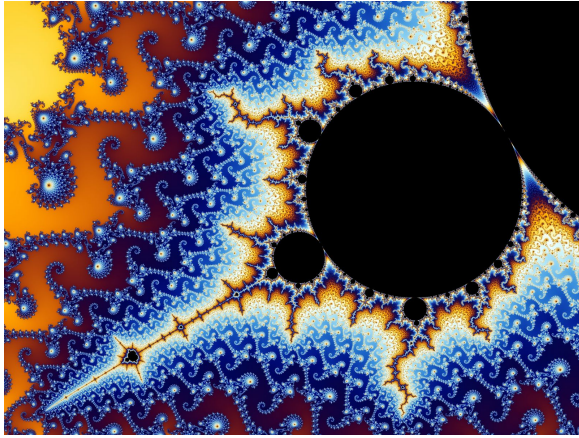
A **@ShrimpingIt** Project Proposal



Human Fractal

Urban experiments in interactive light walls to generate organic forms:

by **Cefn Hoile** 7th August 2017



Human Fractal

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Background

Since 2011, @ShrimpingIt's Cefn Hoile has lived and worked in the West End of Morecambe, creating accessible electronics and internet-of-things projects. A decade before, Cefn completed an MSc in Artificial Life at the University of Sussex, followed by 10 years working as an industrial researcher in Nature-Inspired Technology. Over the last 15 years, Cefn has had extensive experience conceiving, implementing and installing interactive artworks which combine natural and digital forms both as artist and technical support including installations at Tate Britain and the V&A.

The Human Fractal was driven by a fascination with the fractal structures found in nature. It relies on a technical approach of geometrically transformed video feedback established by Cefn at a residency in an Ipswich church with co-founders of the experimental techno-art group The Curiosity Collective.

For urban deployment, Cefn will combine wireless video sending and interactive pan, zoom colour and geometry control to suit deployment across a Lancaster street, sharing sourcecode and instructions for others to replicate this approach across the world.

Criteria

The Human Fractal has been conceived with the following criteria in mind...

- High impact, accessible interactivity for public engagement
- Intense color imagery with complex geometry
- Weatherproof, secure deployment
- Use of free and open source technology
- Public sharing of technical assets for community experiments and replication

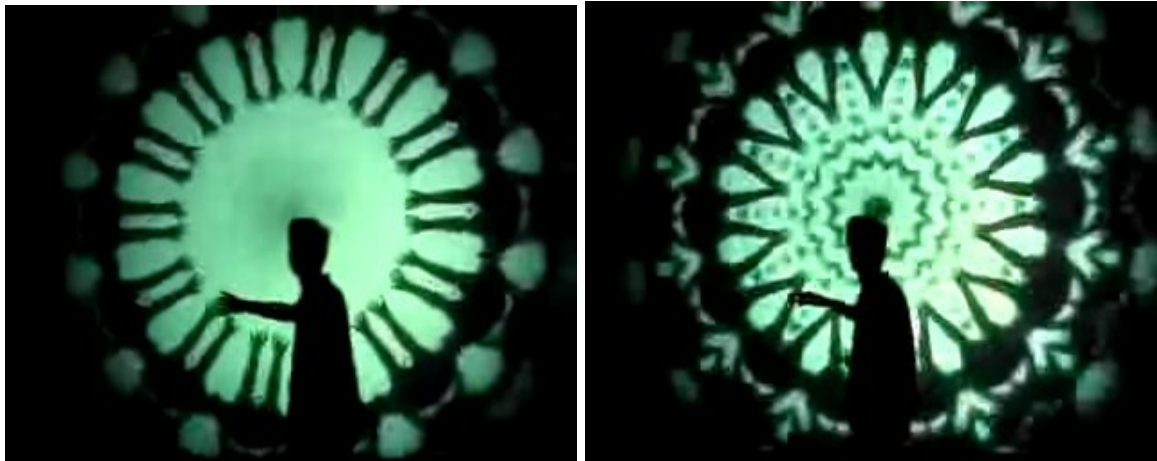


Design

Overview

The Human Fractal, (shown from the experimental video snapshots above and below), will use a HD camera, sending video wirelessly to a Raspberry PI, which is running an open source real-time media package known as PureData.

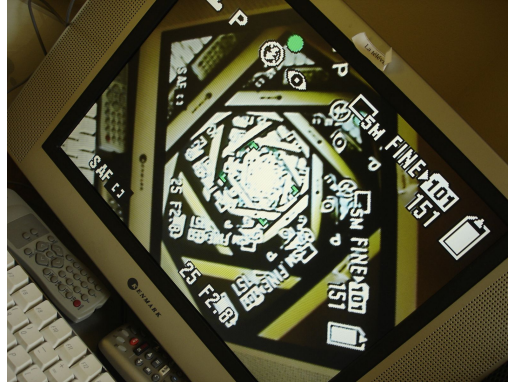
A component from PureData's GEM library provides a Kaleidoscope operation, which transforms live video in a way which emulates the mirrors of an optical Kaleidoscope. Finally, the camera is trained on its own output, causing the geometric transformation to be repeated infinitely.



When originally installed, the pattern typically stabilises to a single video feedback color, which spreads across the screen, however, audience members who step in front of the screen introduce a silhouette into the video feed. Their body parts become incorporated into the transformed video and the 'shadows' cast by their limbs then create incredibly detailed organic, tree-link fractal shapes, which can be controlled by tiny movements from people standing in front of the screen. This causes participants to twist and gyrate their bodies to control the dynamically constructed form.

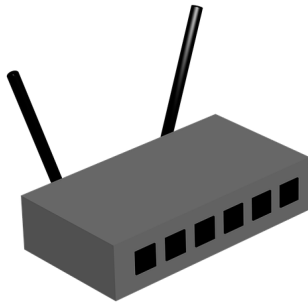
Video Feedback

The installation uses the principle of **video feedback** to create structured imagery, responding to audience interaction, similar to the examples shown below, but with the video transformed through bespoke geometric Kaleidoscope operations.



Wireless Link

The camera will be installed viewing the screen at an acute angle from across the street. The camera and back-projector will be connected by a **dedicated Wifi link**, serviced by two directed dishes to maximise bandwidth.

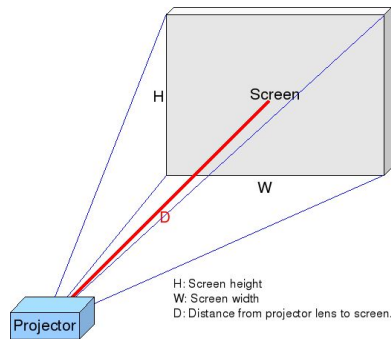


We will need to survey for an upper floor venue with a free mains socket opposite a ground-floor empty shop, to power the wifi camera. The camera can be zoomed in from a distance so there is a lot of flexibility concerning siting and location, and hope to collaborate closely with Light-Up Lancaster to learn more about the network of empty shops which have previously been used for installation work.

The video stream will be established via the GStreamer video package, which should guarantee high throughput over the 10 or so metres separating the camera from the projector.

Weatherproofing, Safety and Security

Since the back-projector is sited securely in an empty shop, and the camera is viewing from an upper floor on the opposite side of the street there should be no issues of public safety or security. **No direct contact** will be made with members of the public.



If the choice is made to deploy an outdoor camera, this could help minimise interference from rain on the window opposite. However, other interventions, such as treating the outer glass of the window to repel water are available, meaning the camera could be simply sited on an opposing windowsill and powered from an ordinary consumer mains socket.

Power

Power usage from the wireless camera install will be minimal. The back-projector will have higher demand. A £10 contribution to power costs could be made from the artist to the camera host or shop owner as required, which would more than compensate for the actual usage.

Maintenance

No maintenance is expected to be needed during the installation, which will continue without intervention.

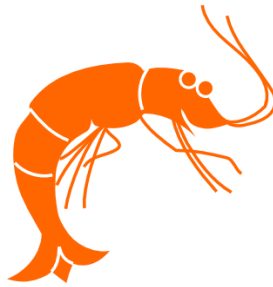
Finance

The budget of £2000 will be divided as follows...

Programming and configuration of Network, Camera, Wireless Link, Video transform, Pan, Tilt, Zoom control and parametric experiments	4 days at £250 per day	£1000
Test installations (> 1 week before)	2x 0.5 days at £250 per day	£250
Final installation	1 day at £250 per day	£250
Purchase of camera, wireless equipment, Raspberry Pi computer and leads	£250	£250
Sourcing Projector and Screen	£250	£250
Total		£2000

Schedule

Development of the end-to-end prototype will be delivered, tested and documented by mid October 2017 and shared with Light-Up Lancaster. A test installation will be undertaken at the preferred site, or an equivalent location, to eliminate any last-minute concerns, more than a week in advance of the final install, to ensure there is time for additional supplies or software interventions to iron out last minute wrinkles. After the installation is completed, all resources and documentation will be released into the public domain, and the software released under open source license.



@ShrimpingIt
13 West Street, Morecambe,
LA3 1RB