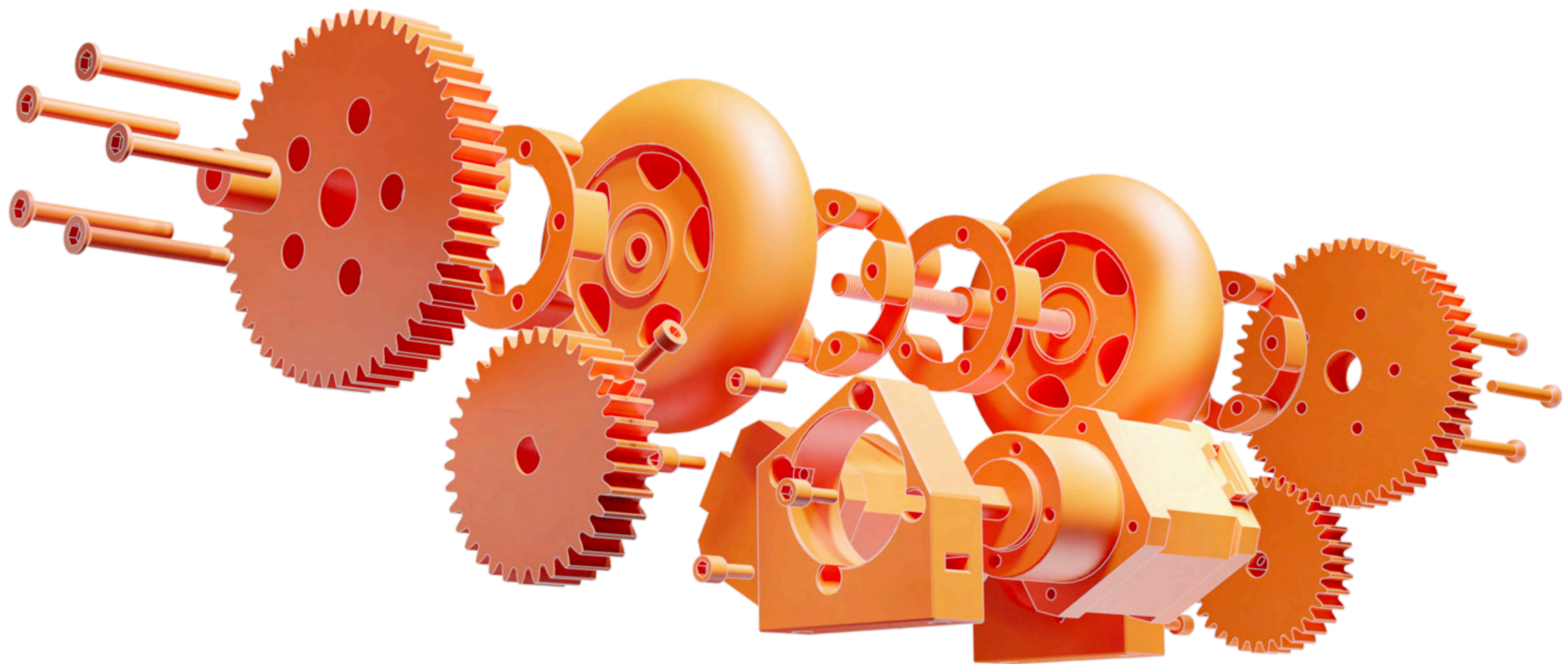


Newton Chan

Industrial Designer

Selected works 2026





Hello! I'm **Newton Chan**

I love understanding complex systems and finding thoughtful ways to make them better. That might mean developing a manufacturing process, designing an interactive installation - or building custom tooling. Much of my work sits somewhere inbetween industrial design, engineering, programming and making.

I'm particularly drawn to projects that cross disciplines and require me to figure things out along the way. I enjoy working closely with specialists, getting ideas into prototypes and translating complex technical challenges into practical, tangible outcomes.

Outside of work, you'll typically find me messing around with old electronics, experimenting with fabrication techniques and exploring how we can adapt emerging technologies into our everyday systems

01

Masters Thesis

Novel sheet metal forming machinery



*Mechanical Design
Systems Engineering
Digital Manufacturing*

02

Kihikihi

Interactive sonic art installation



*Installation Design
Interactive Systems
Electronics & Fabrication*

03

Panasonic m7

Retrofitting an analogue camcorder



*Reverse Engineering
Digital Fabrication*

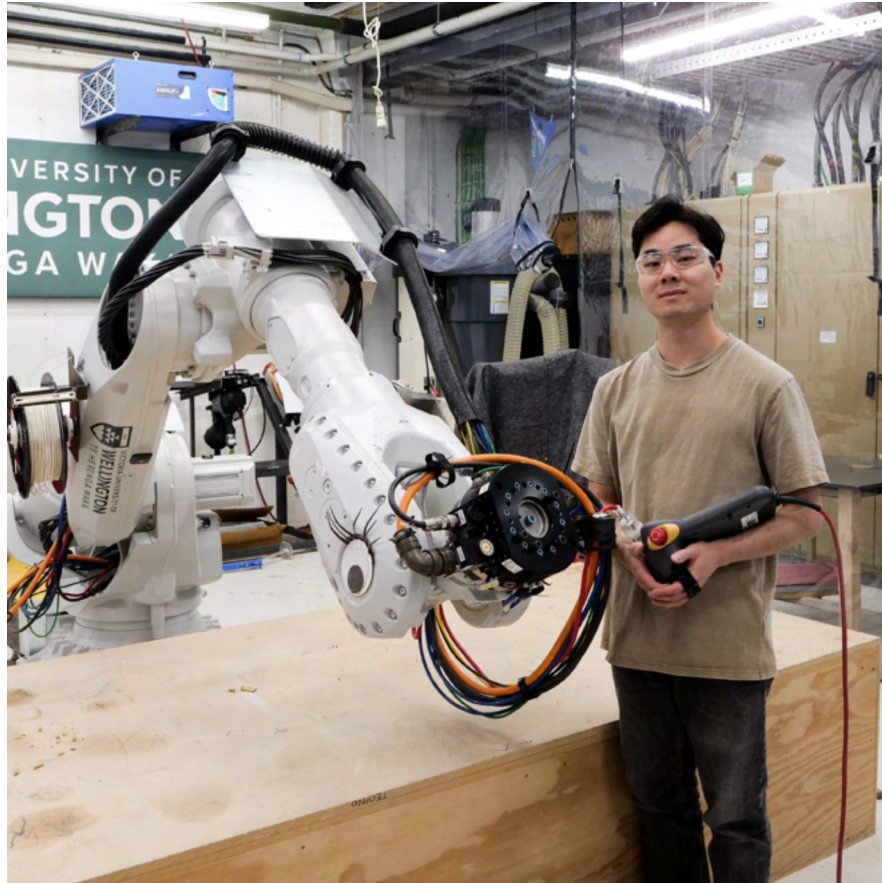
04

Clinical data capture

Custom camera for medical research



*Design for Clinical Research
Rapid Prototyping*



01

Digital Robotic Sheet Metal Forming

Experimental manufacturing platform

Master of Design Innovation

Victoria University of Wellington

2023 - 2024

Supervisor: Tim Miller



Project Overview

Over twelve months, I designed, fabricated and validated an experimental manufacturing platform from the ground up. The project explored a novel roller-based process for forming curved crease geometries in sheet metal without dedicated tooling.

The system brought together mechanical design, CAD, electronics, firmware, fabrication and testing within a single development workflow. I was responsible for taking the project from early proof-of-concept experiments through to a functional machine capable of producing a range of formed geometries.

Rather than developing each component in isolation, the machine, tooling and forming process had to evolve together through continuous testing and iteration.

Identifying the Opportunity

Early experiments revealed the novel roller machines capability to form complex curved crease geometries in sheet metal without dedicated tooling. Although these early results lacked precision and repeatability, they consistently demonstrated behaviour that conventional forming processes could not easily achieve.

Unlike conventional sheet metal forming, the process required no dedicated tooling, suggesting the possibility of a more flexible approach to manufacturing complex geometries.

With this proven concept, the project then shifted toward a more ambitious goal: developing an entirely new manufacturing platform capable of producing curved crease folding geometry through a controlled, digitally programmable workflow.

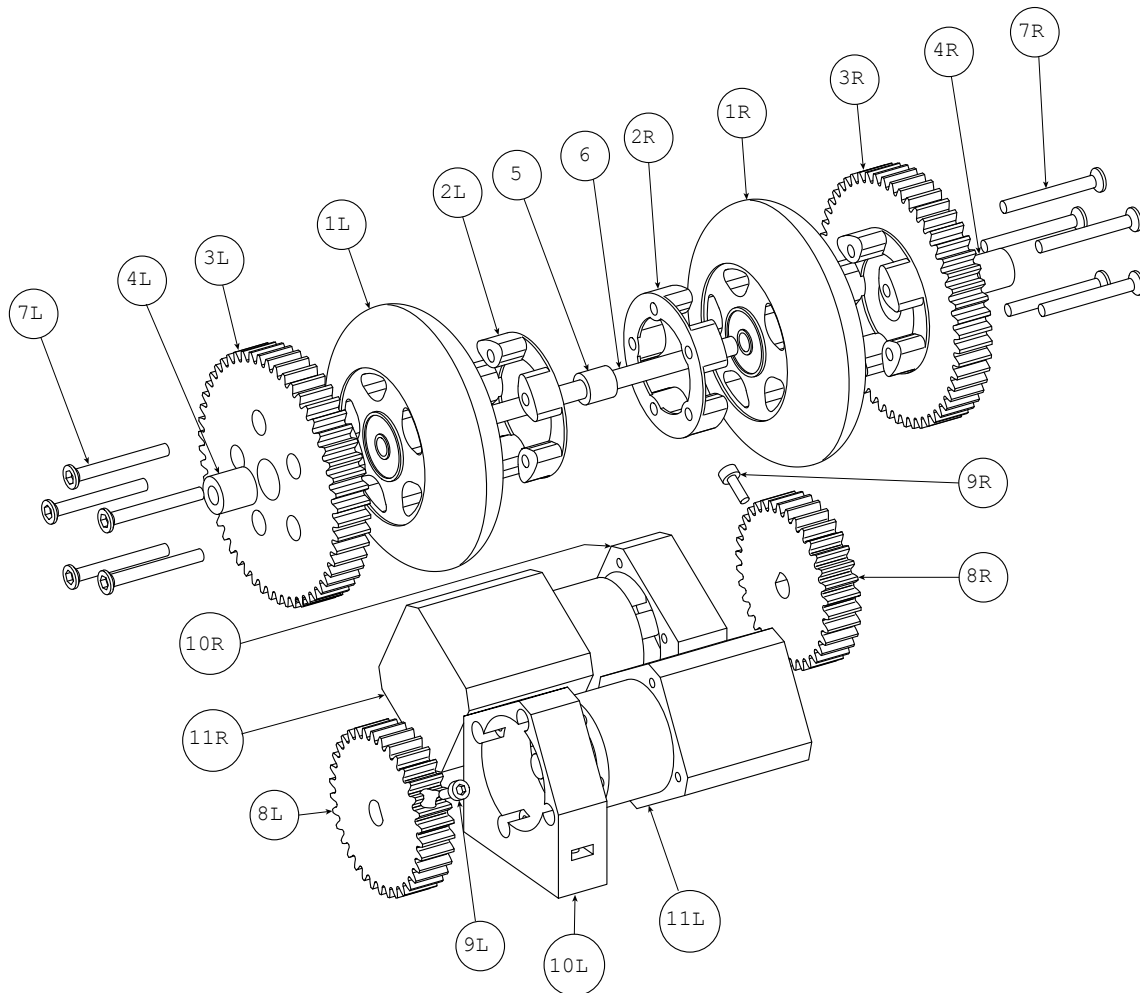


Motorised Support Roller Assembly

Labeled Exploded View

Not to scale

Nº	Desc.	Fab.	Material
1	Support Roller	Purchase	
2	Support Roller Hub	3D Print	PLA+
3	Spur, M1.5, 52T	3D Print	PLA+
4	Spacer 12x12.5	Lathe	Mild Steel
5	Spacer 12x10	Lathe	Mild Steel
6	Axle 8x95	Purchase	
7	M4X30 Countersunk	Purchase	
8	Pinion, M1.5, 34T	3D Print	PLA+
9	M4x25 Set Screw	Purchase	
10	Mounting Block	3D Print	ABS
11	Nema 17 Stepper Motor	Purchase	



Engineering the Platform

Transforming the initial observation into a repeatable manufacturing process required far more than refining just the forming mechanism. An entirely new experimental platform was developed to deliver a controlled, programmable and repeatable process with room for development and evaluation.

Designed and built from the ground up, the system integrated CAD, mechanical design, electronics, firmware, fabrication and experimental testing into a single development programme. Every component, from custom roller assemblies to sensor integration and machine control, was iteratively refined to create a reliable platform for investigating the forming process.

Complete system designed, fabricated and programmed by a single developer over a twelve-month research programme.

Every Panel. Unique.

Conventional sheet metal manufacturing is defined by tooling. Every new geometry demands new dies, new setup and additional cost.

Rather than manufacturing identical components, this process enables every panel to be generated directly from digital data. The resulting design freedom opens opportunities across architecture, furniture, public art and lightweight structural systems, where variation becomes a defining feature rather than a manufacturing compromise. By replacing dedicated tooling with a programmable workflow, the platform demonstrates a shift from traditional mass production toward digitally driven mass customisation.

Selected aspects of this project have been omitted due to ongoing intellectual property development and commercial confidentiality.



02

KIHIKIHI

Anne Niemetz & Newton Chan

Interactive Electronic Art Installation

2022 - Ongoing

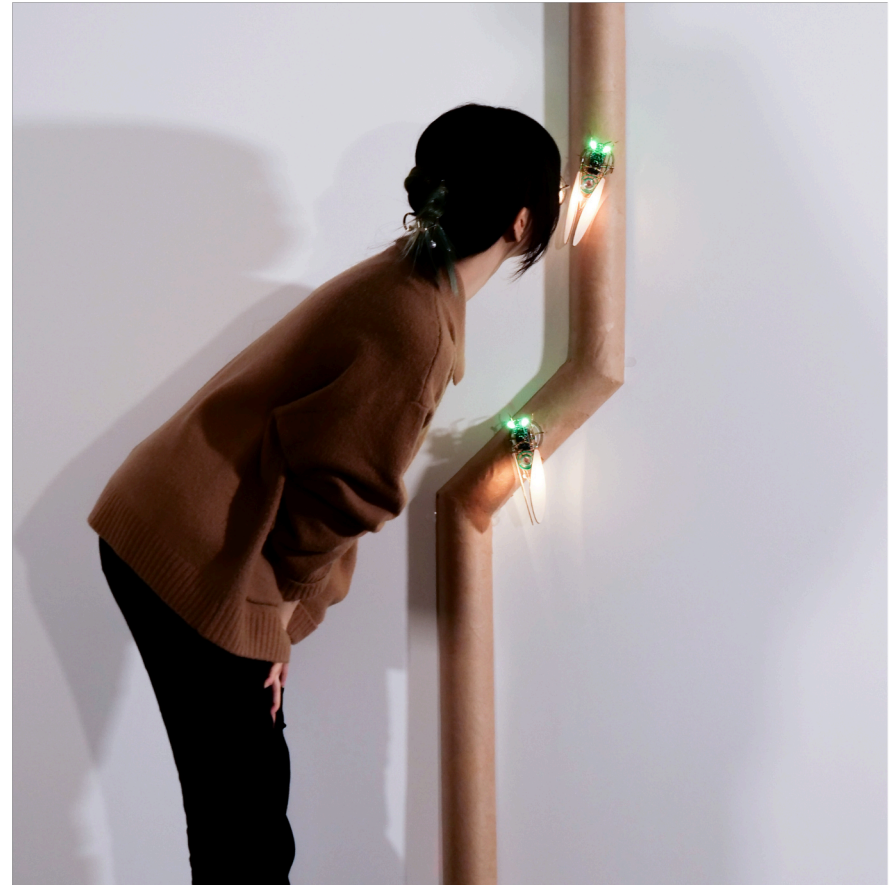
Exhibitions & Media

Thistle Hall Gallery,
Wellington, New Zealand
2024

Museum of Contemporary Art
Santa Barbara, California
2026–2027

Yanko Design
Design Boom

kihikihi.info
offst.works





KIHIKIHI

Kihikihi, named after the Māori word for cicada, is an interactive electronic art installation inspired by New Zealand's chorus cicada (*Amphipsalta zelandica*).

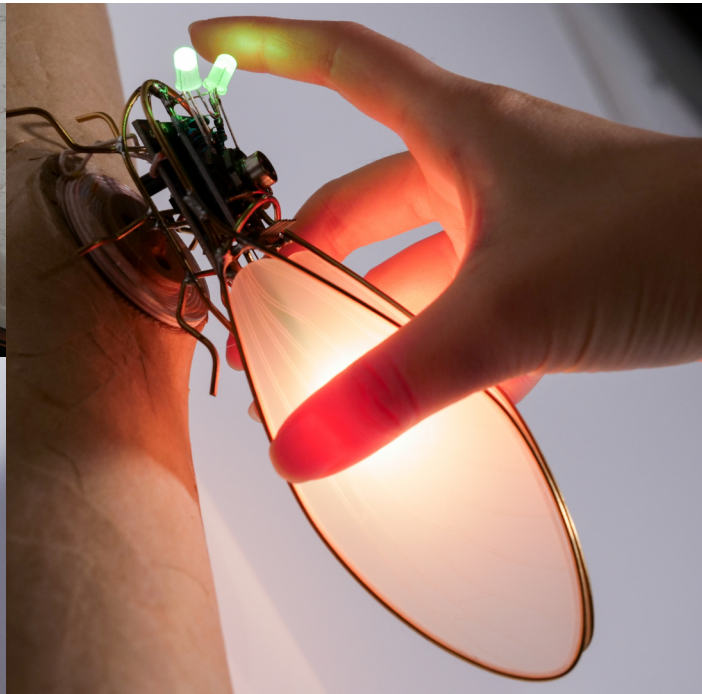
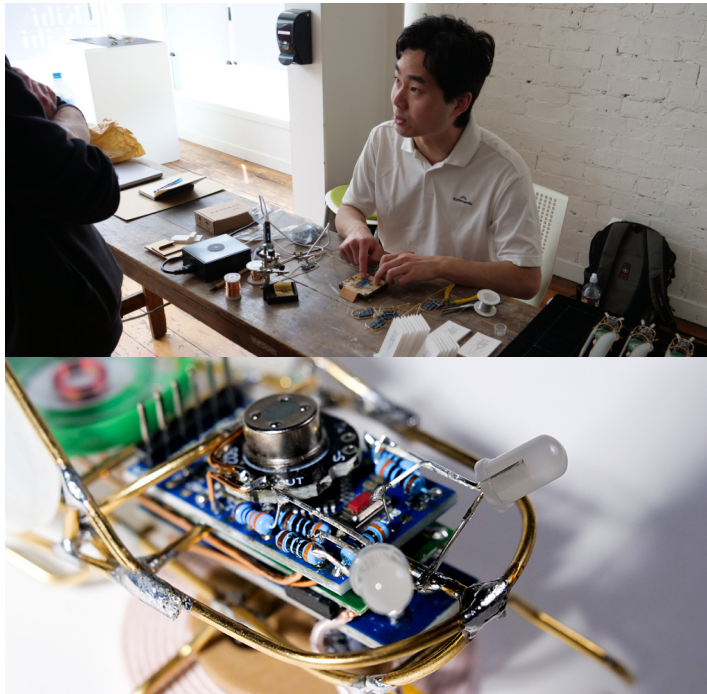
Individually, the electronic insects are simply sculptural objects - The work only becomes complete through audience participation where visitors are invited to pick up electronic cicadas, place them on electronic trees and discover how each interaction reshapes an ever evolving soundscape. In doing so, the audience becomes an active participant, transforming a collection of technical objects into a shared artistic experience.

Although each cicada behaves independently, together they create the impression of a living brood communicating through sound and light.

Bringing it to Life

Over the course of bringing Kihikihi to life I developed custom electronics, fabrication jigs and embedded software that mimic the behaviour of New Zealand's chorus cicada. Every element, from the physical construction of each insect to its behaviour, was designed to encourage curiosity and invite interaction.

The electronics alone are not the artwork. They are simply the stage through which visitors explore, play and collaborate. It is the audience's participation that transforms a collection of independent technical systems into a living artwork.





Public Exhibition

Kihikihi Matua

Thistle Hall Gallery
Wellington, New Zealand

December 2024

The sound of the cicadas chirping drew visitors into the gallery before they had even seen the installation. Creating an atmosphere where watching how different visitors discover and respond to the work became part of the shared experience. A sense of curiosity often took hold of the audience, allowing them to gradually and organically uncover how the cicadas responded with their collective behaviour emerging naturally through interaction.

The Next Chapter

Kihikihi Wawā

Museum of Contemporary Art
Santa Barbara, California
2026 - 2027

Kihikihi continues to evolve through *Kihikihi Wawā*, an upcoming exhibition at the Museum of Contemporary Art Santa Barbara.

This next generation adapts the installation to new spatial arrangements and layouts, iterating on the spatial scale and experience of the interactive installation.

kihikihi.info
offst.works





03

Re-engineering an Analogue Workflow

Personal Project
2025

Panasonic M7

Released in the late 1980s, the Panasonic M7 was built around proprietary NiCd batteries, analogue video output and ageing hardware that limited its functionality in today's technological era.

Rather than restoring the camera to its original specification, this project re-engineers the systems around it. Modern power, digital recording and contemporary connections are integrated through reversible modifications, extending the life of an analogue camera while preserving the character and experience of the original.

The project combines reverse engineering, CAD and digital fabrication to bring a 40-year-old camera into a contemporary workflow without asking it to become something it isn't.



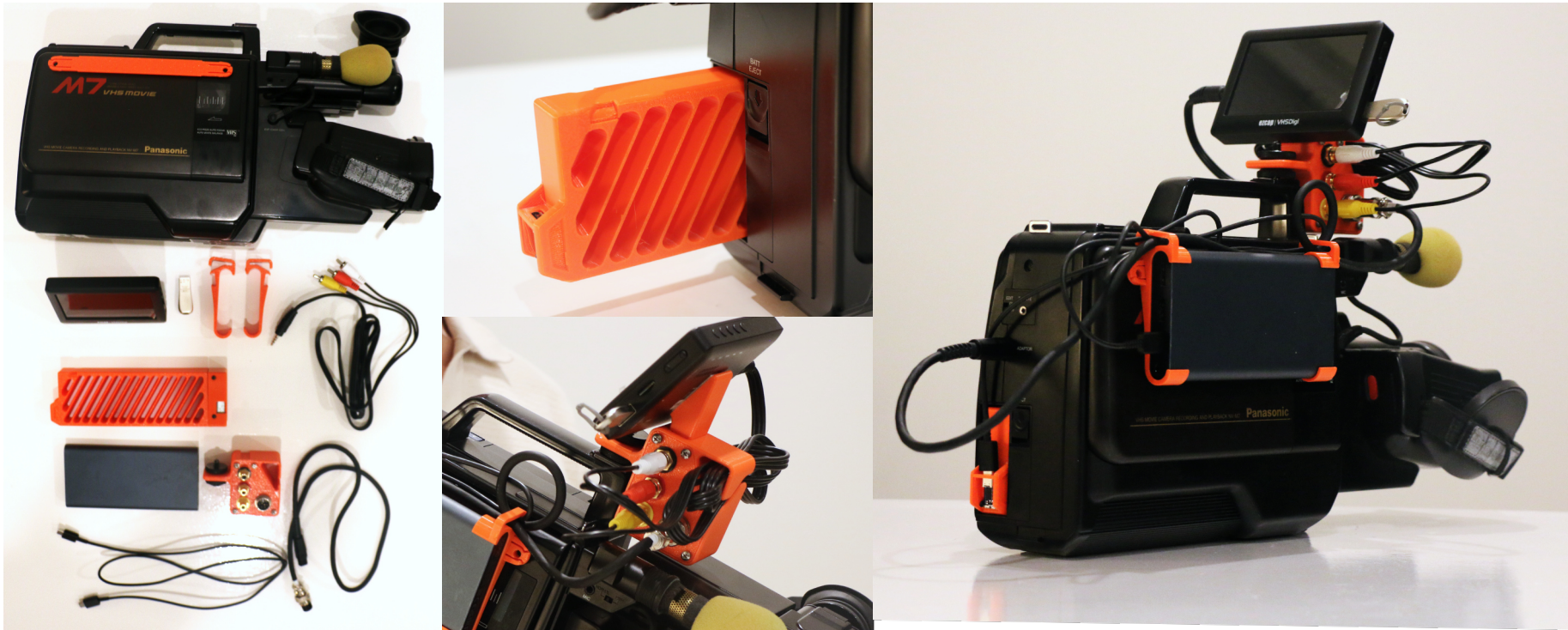
Reverse Engineering the system

After more than forty years of use, many of the Panasonic M7's original electronic systems had become impractical for modern day use. Rather than restoring the camera to factory specification, the project introduced a range of reversible upgrades that extends its capability while preserving the original bones of the camcorder.

Every interface required reverse engineering. Original battery packs, cassette housings and external connectors were measured and recreated digitally before new assemblies could be designed around them. Each component was designed to balance structural performance, serviceability and visual integration while remaining completely reversible.

Guiding Principles

- **Modern Power**
Replace proprietary NiCd batteries with rechargeable USB-C power while preserving the camera's balance and runtime.
- **Reversible Installation**
All components mount using existing attachment points so the original camera can be restored without permanent modification.
- **Digital Workflow**
Enable direct to digital recording and external monitoring while retaining the original shooting experience.
- **Homage to the Original**
New components complement the camera's existing design language rather than competing with it.



Panasonic M7

MKII

**Still Shooting.
Forty Years On.**

Designed in 1987. Reimagined for Today

Rather than restoring the Panasonic M7 to its original specification, this project re-engineers the systems around it. Modern power, digital recording and contemporary workflows are integrated through reversible modifications, extending the life of an analogue camera built to keep creating.



Captured on the Panasonic M7



04

Improving Clinical Data Capture

University of Auckland | Bioengineering Institute

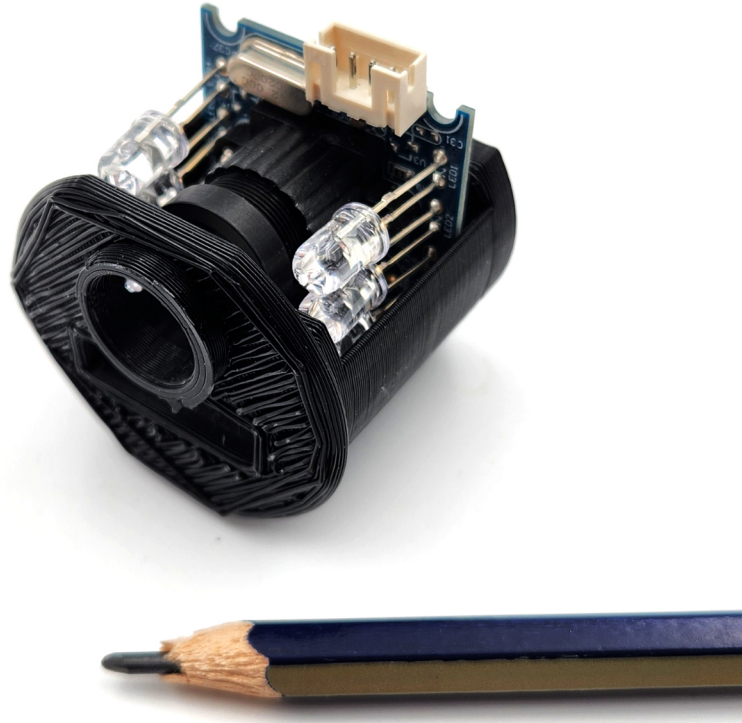
Design for clinical research

2023 | 8 Weeks

Outcome

Functional prototype delivered





Original research camera
assembly

Bridging Camera and Patient

Developed over an intensive eight-week collaboration with researchers at the University of Auckland Bioengineering Institute, this project explored how industrial design could improve the quality and consistency of eye images used to train an AI system for diagnosing lazy eye syndrome in children.

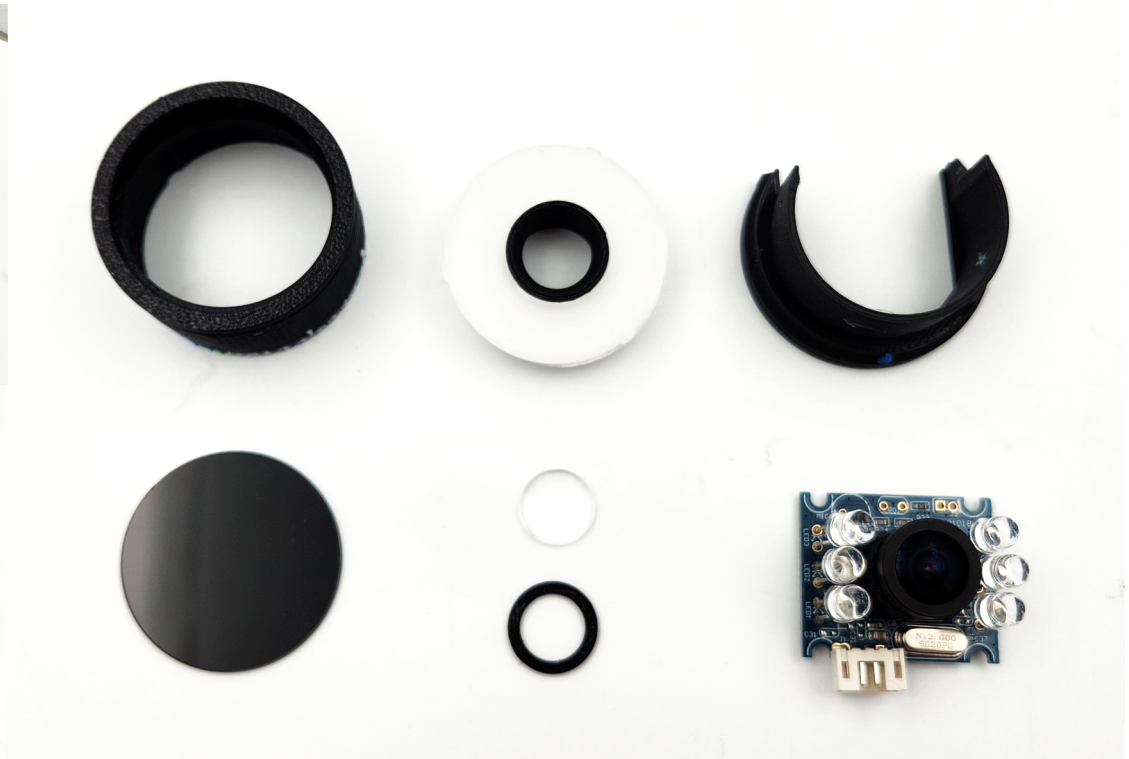
Rather than redesigning the imaging system itself, the focus was on improving the interface between the camera and the patient. The resulting housing improved positioning, optical performance and repeatability while remaining lightweight, manufacturable and quick to iterate.

Working to a compressed research timeline, the project moved from an existing prototype to a functional, tested solution within just two months.



Research Camera Module

Clinical frames



Accelerating Iteration

With researchers based in Auckland, additive manufacturing became central to the development process.

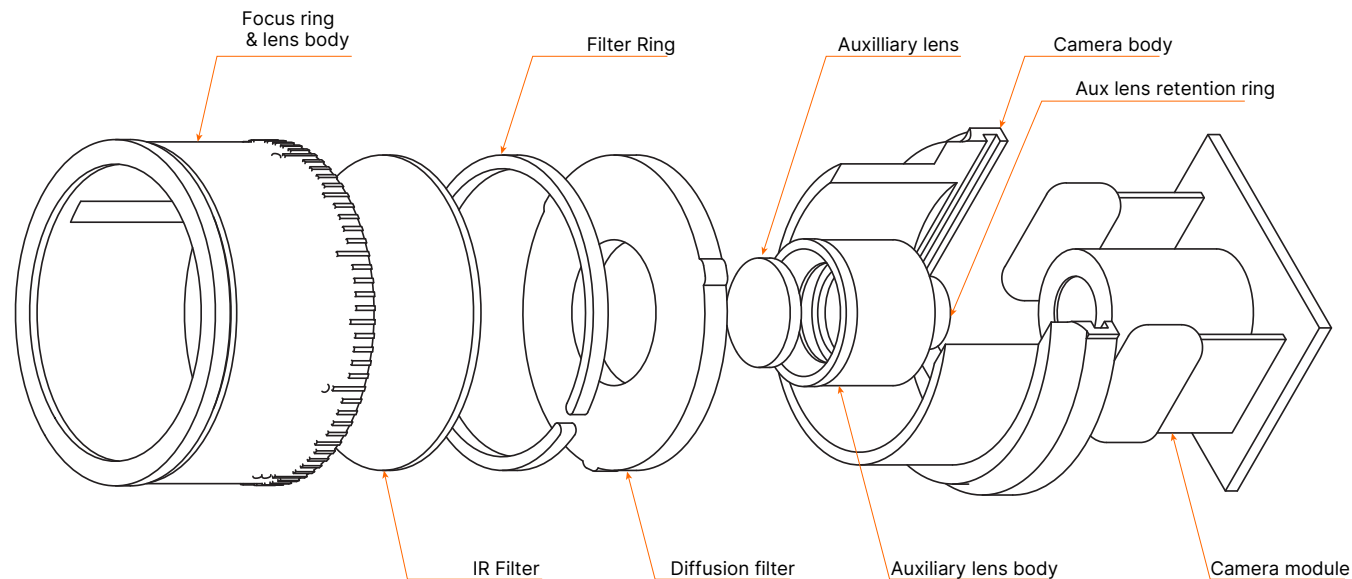
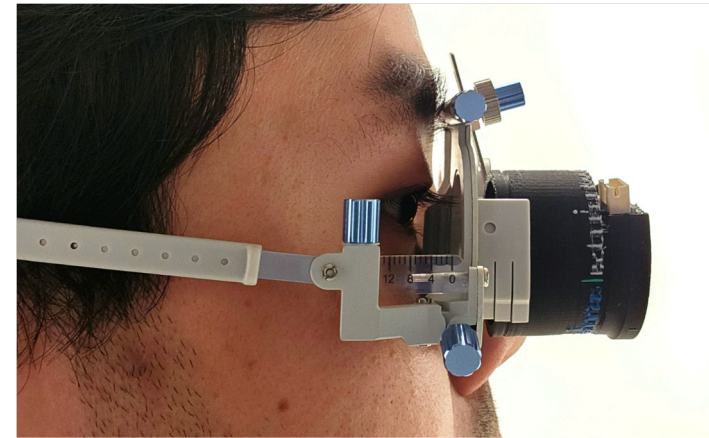
Rather than shipping physical prototypes, CAD files and assembly instructions were shared digitally. Researchers printed each revision overnight, evaluated it the following morning and returned observations that informed the next design revision.

This compressed the traditional design-build-test cycle from weeks into days, enabling multiple development iterations within an intensive eight-week collaboration.

Designing Within Constraints

Design Requirements

- **Repeatable Positioning**
Consistent positioning relative to the eye to ensure quality and repeatability of captured image data.
- **Image Quality**
The apparatus's requirement to capture the iris and surrounding eye with sufficient clarity for AI training while maintaining accurate lens alignment.
- **Minimised Reflections**
Optical filters included to reduce hotspots and unwanted reflections that could obscure image data.
- **Lightweight Construction**
The apparatus needed to remain comfortable and stable on children's heads with an emphasis on minimising weight.
- **Optimised for Digital Manufacturing**
Components optimised for FDM printing and lasercutting, enabling rapid iteration and straightforward production.
- **Tool-Free Focus Adjustment**
Focus must be able to be adjusted externally without disassembly. Simplifying setup during clinical testing.

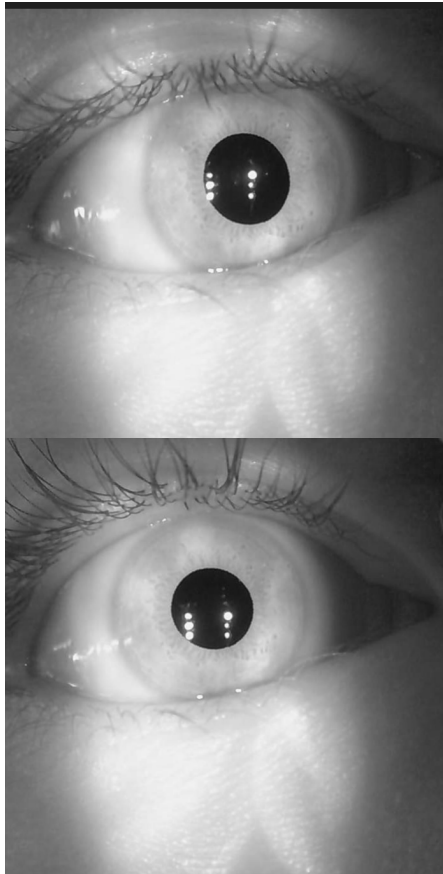


Capturing Better Data

The redesigned housing transformed an unstable research prototype into a repeatable image capture system. By improving positioning, optical control and lighting, the design produced cleaner, more consistent eye images while remaining lightweight and suitable for clinical use. These improvements strengthened the quality of data available for both clinical assessment and AI model training.

Before

Existing Research Setup

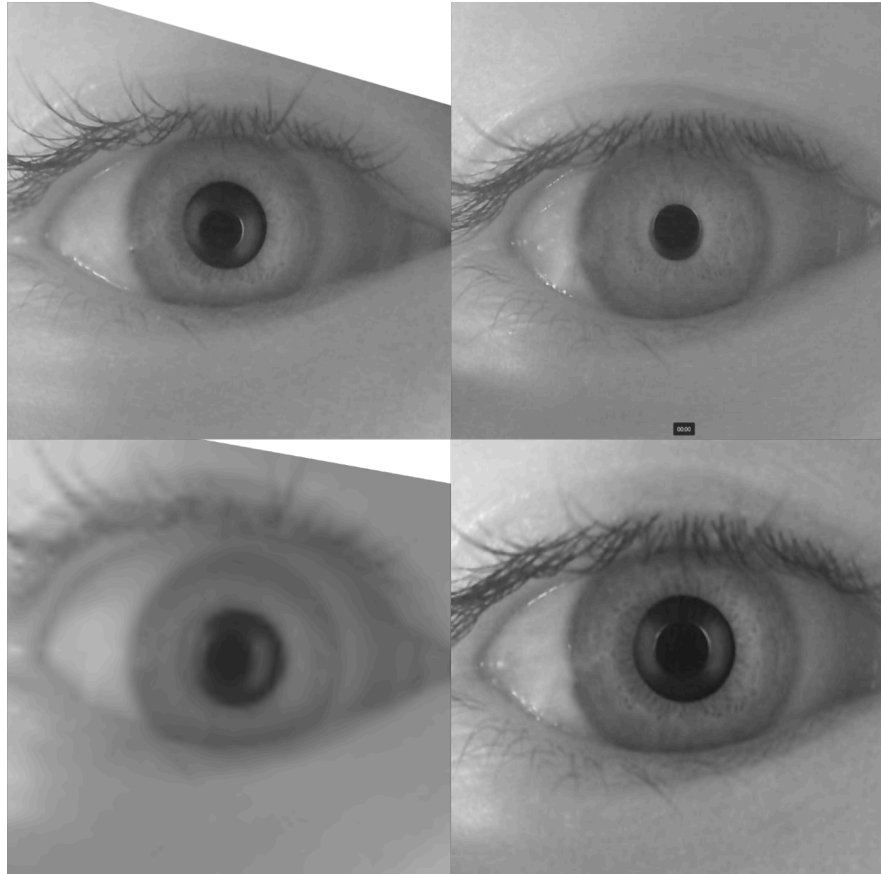


Bright reflections
Shallow focus
Variable positioning

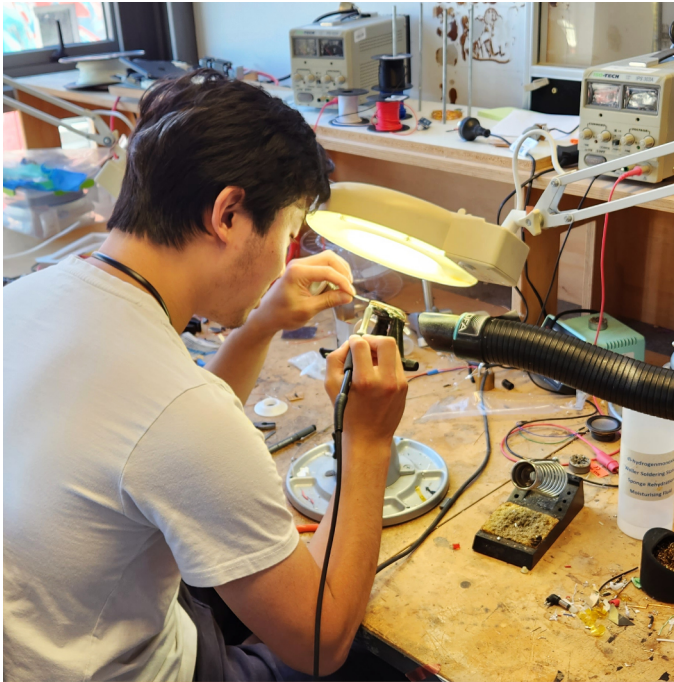


After

Final Camera Design



Reduced reflections
Sharper iris detail
Consistent positioning



Looking Ahead

Across every project in this portfolio, one theme has remained constant: bringing ideas and people from different disciplines together. From manufacturing research and interactive installations to medical devices, I've found the most rewarding projects are those that sit at the intersection of design, engineering and making.

As I look ahead, I'm excited to continue working with people who enjoy tackling complex problems, learning from different perspectives and turning ambitious ideas into thoughtful, practical outcomes.

Lets build something.

Newton Chan
Industrial designer

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