

# INDUSTRIAL TRIAL



**UNSW**  
AUSTRALIA

Graduation Projects  
Industrial Design

Never Stand Still

Built Environment

# DESIGN 2015

Each project has to demonstrate integration and balancing of technical and functional constraints, user needs and experience, resolution of form and aesthetics, and business contexts. But doing so, students demonstrate the culmination of their developing skills and knowledge as emergent industrial designers. The work included in this catalogue only represents a small part of their specialised capabilities.

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# PROFESSOR ALEC TZANNES AM

Congratulations to the students who have completed their degree at UNSW Built Environment and now join our alumni community.

This catalogue provides a glimpse into some of the many study themes and projects you have undertaken as part of your academic experience and serves as a record of your graduation class.

We have designed your program of study to reflect advanced contemporary professional practice emphasising the development of leadership skills and innovation, ensuring that as a graduating student you have the best opportunity to be at the forefront of your chosen field of endeavour.

Now that you have graduated, our relationship evolves from student to alumnus, continuing a lifelong engagement of support and involvement (register to join the alumni community at [www.alumni.unsw.edu.au](http://www.alumni.unsw.edu.au)). As you travel the world through your career, you will meet many alumni who have become global leaders through their innovative thinking, acting as catalysts for change in all facets of the built environment professions as well as in other fields of work. As an alumnus we encourage you to keep in touch with UNSW Built Environment. We are always keen to support our graduates and publish their successes throughout our alumni network. Please email us your news and updates at [BEalumni@unsw.edu.au](mailto:BEalumni@unsw.edu.au).

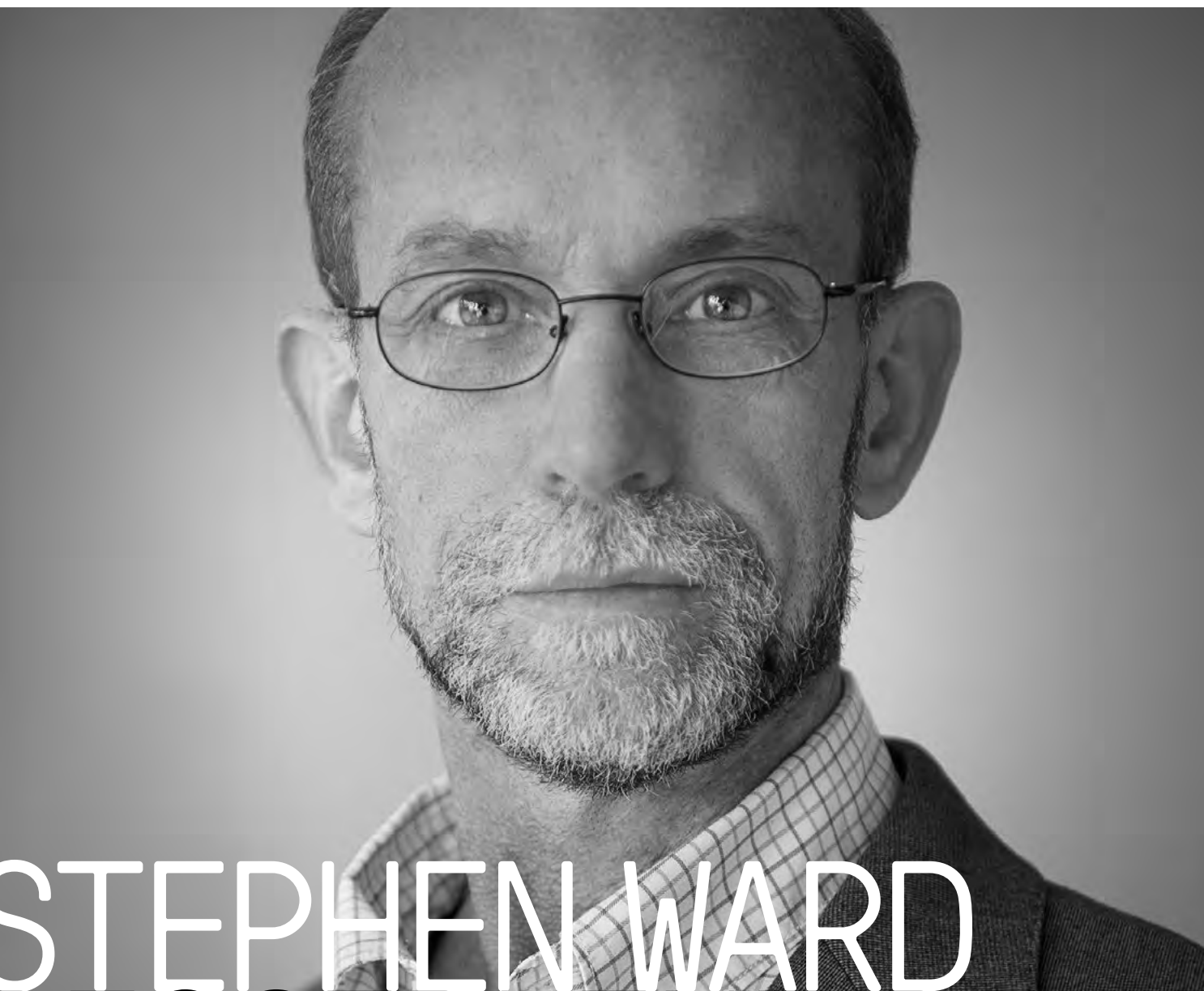
We are also always grateful to our alumni who support our future students with scholarships, prizes, internships and mentoring programmes.

Should you wish to further your education, qualifications and knowledge, UNSW Built Environment Graduate School of Urbanism (AGSU) offers an extensive suite of post professional degrees. AGSU focuses on advanced qualifications in specialised interdisciplinary areas of professional practice and a suite of highly relevant research orientated programs of study. Our commitment to being the leading educators in the design and delivery of more liveable, sustainable cities has underpinned the creation of the AGSU.

As a professional, I also invite you to join our LinkedIn group (UNSW Built Environment) where you will be able to keep in touch and network with your peers, other professionals and UNSW Built Environment.

I wish you a successful and rewarding career.

Professor Alec Tzannes AM  
Dean, UNSW Built Environment



# STEPHEN WARD DISCIPLINE DIRECTOR

The Industrial Design student work on display at the FORM15 exhibition, and reproduced in this catalogue, makes visible and tangible a range of creative proposals that provoke the questions 'what if?', or 'why not?' as well as presenting coherent and detailed responses to a need or opportunity explored by each student. Students this year have presented design proposals that contribute to wellbeing for individuals and the community in many areas of life such as leisure, communication, safety, transport and business.

The four-year Bachelor of Industrial Design program at UNSW is an "embedded honours" program in UNSW terms – that means the final year is an honours level study experience. In both the research phase and the design development, each student has undertaken independent exploration in a largely self-directed project. The skills, knowledge and spirit of inquiry cultivated throughout the whole of the BID program are evident in the final designs now on show.

This exhibition highlights the innovative thinking and sheer hard work of students in bringing these substantial projects to completion but it is also appropriate here to acknowledge the expertise and commitment of academic staff and a larger number of sessional tutors and guest lecturers who bring experience and skills from their roles in industry. I particularly acknowledge the contribution of Dr Miles Park, the convenor and coordinator of the studio course in which these projects were completed.

It has been a privilege to have been on the journey with the students now finishing. I congratulate them and wish them well in their further endeavours.



# MILES PARK COURSE CONVENER

This catalogue offers a snapshot of each student's design project they undertook during Studio 8 in 2015, the final 'capstone' studio course for the Bachelor of Industrial Design at UNSW.

Each project commences as a topic of their choosing and research is undertaken during the first half of the year. This enables students to gain a critical and informed understanding of their topic in order to identify design opportunities. These opportunities are further defined and then developed as industrial design projects during Studio 8.

Each project has to demonstrate integration and balancing of technical and functional constraints, user needs and experience, resolution of form and aesthetics, and business contexts. But doing so, students demonstrate the culmination of their developing skills and knowledge as emergent industrial designers. The work included in this catalogue only represents a small part of their specialised capabilities.

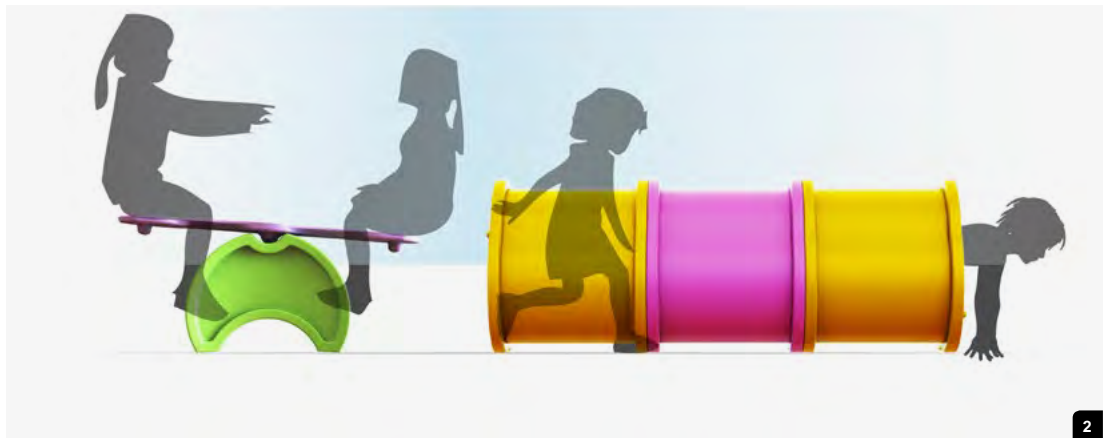
I wish to thank the many tutors who have contributed to Studio 8. Their professional experience and knowledge has been invaluable to enable students to prepare for professional design practice. They are; Kristina Zlomislic Brancaccio, Craig Burke, Doug Nash, Giles Day, Dan Connell, Min Kong.

On behalf of my colleagues, we congratulate the students on their achievements and wish them every success with their future career.

BACHELOR OF  
INDUSTRIAL  
DESIGN  
FINAL YEAR  
PROJECTS



1



2



3

Physikids

Physikids is for the engaged classroom of the 21st century. It is a system of play parts which engages students in the socio/emotional aspects of play. Physikids is a collaborative playground for students aged five to eight years old. It enables children to practice skills of communication, creativity, problem-solving and collaboration. Unlike other types of play equipment, Physikids is a free play system which lets children's imagination and creative thinking have an outlet in an outdoor environment during school play time.

Physikids has five main rotomolded HDPE components that can be combined together to perform a variety of forms for children balance, crawl, push and pull and climbing. These components pack neatly away and compliment each other in their form and aesthetics. They can be used in conjunction with other playgrounds structures to supplement physical and imaginative play activities.

Contact

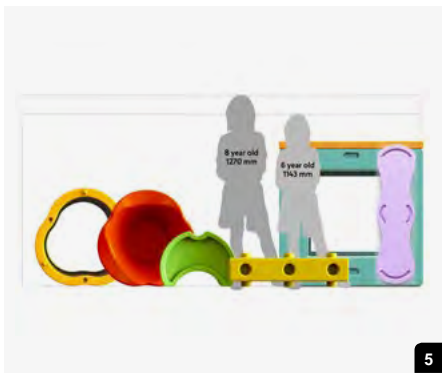
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Pictured

1. Physikids set
2. Tunnel system and see saw
3. Spinners
4. Exploded view
5. Ergonomic scale of the product

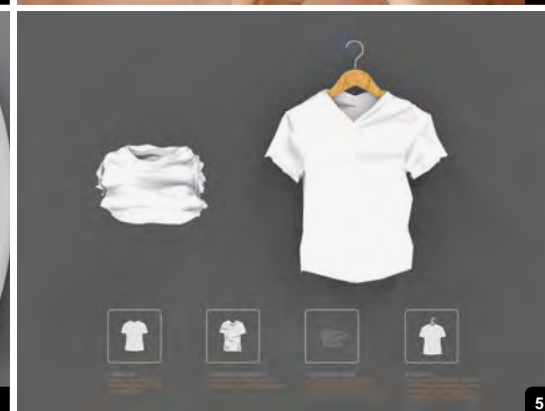
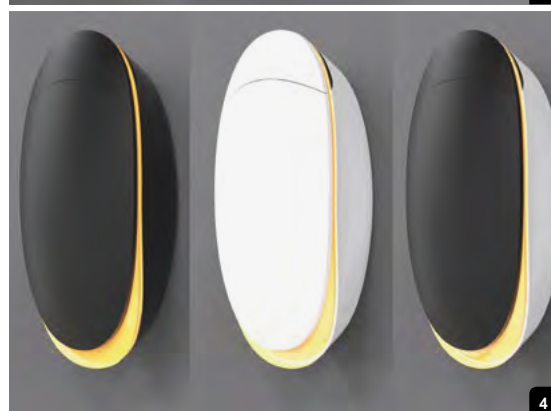
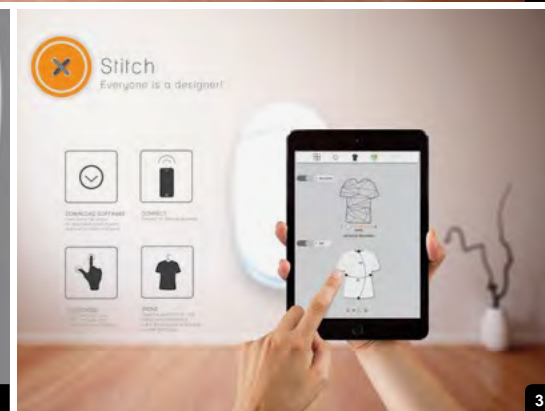
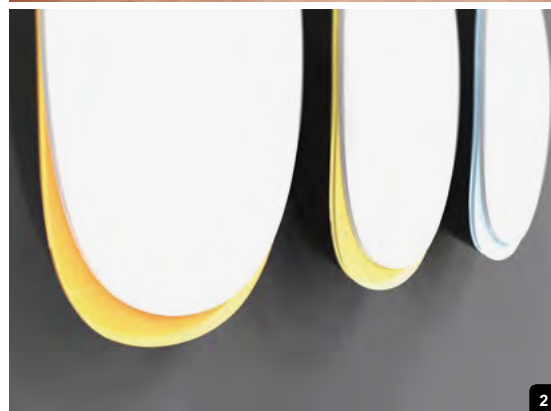


4



5





**Tela**

Tela (Latin for cloth and fabric) expands the 3D printer material palette and allows consumers to easily print their own textile clothing. The product form hides the complexity of the technology in a wall mounted, noise reducing case. The system uses technology from Fabrican using a liquid suspension to form fabric through the cross-linking of fibres that adhere to each other to create an instant non-woven fabric. The liquid is contained in cartridge canisters that can be easily swapped for different colours or fibre blends.

Different colours of the illuminated LED strip indicate print status and printing progress. Blue indicates the printer is turned on or idling, Yellow indicates printing in progress and Orange indicates the printer has encountered a problem. When a print has finished the printer will pulse light blue.

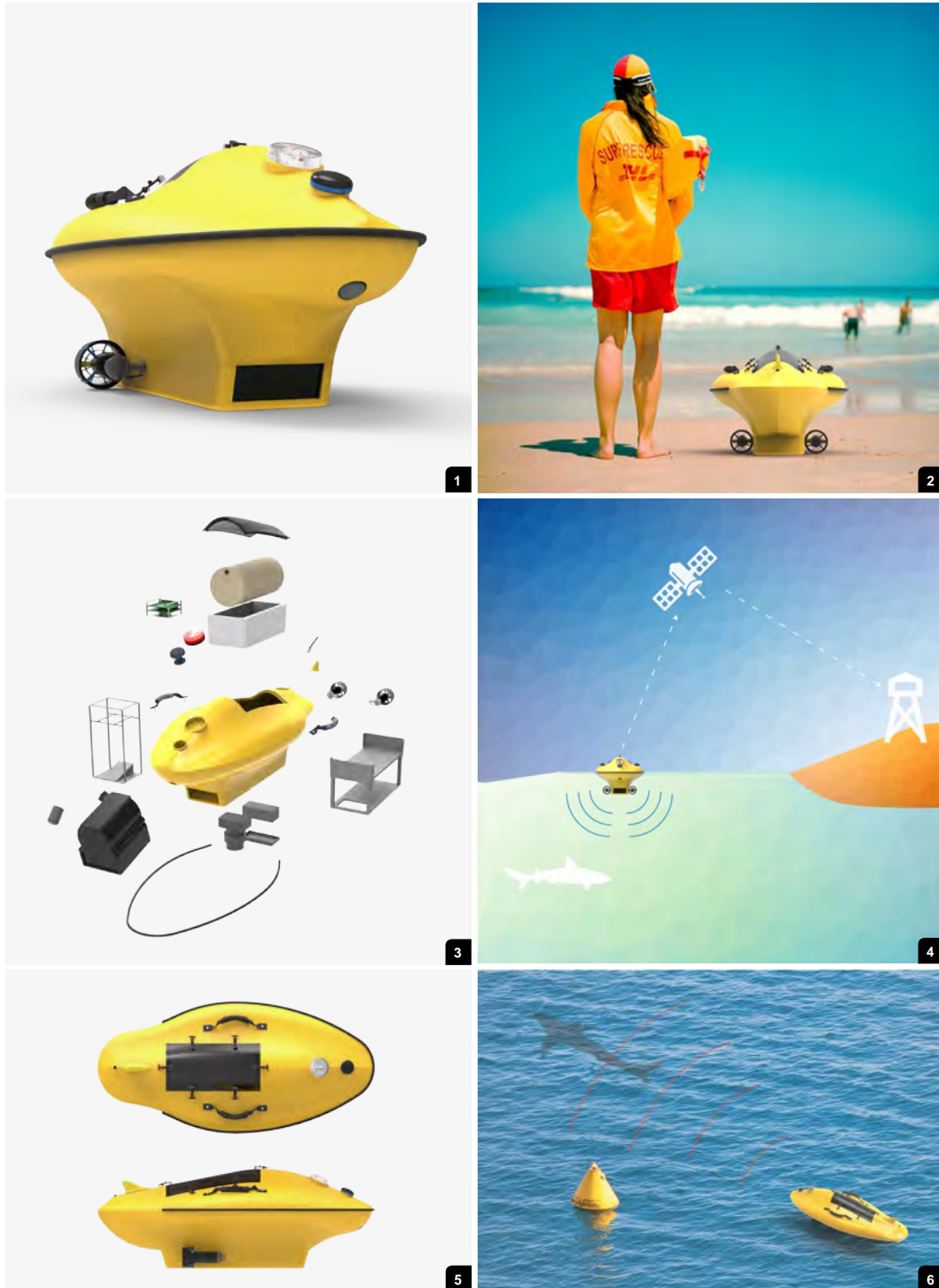
Fashion is a key factor of how we choose to express ourselves physically and emotionally. Tela creates a personal interaction with the clothing we wear. Complementing the Tela print system is the Stitch app. This enables users to shop online and/or create their own clothing designs ready for printing.

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**Pictured**

1. Hero shot
2. Close up illumination functions
3. Stitch app interface
4. Material options
5. 3D printed shirt



## Triton

### Autonomous surface vehicle

Triton is an Autonomous Surface Vehicle (ASV) for Surf Life Savers who patrol highly populated beaches where shark control programs are in force. Triton ASV is a shark detection method that will identify sharks that are likely to threaten to highly populated beaches. Unlike other shark control programs, Triton ASV will effectively prevent shark attacks at highly populated beaches without the negative effects of by-catch and shark culling.

Triton ASV surveillance system uses dual-frequency identification sonar (DIDSON) to produce high definition visual data in real-time. On board microprocessors are able to quickly evaluate the sonar data and determine a potential shark threat. When a threat is detected this information is relayed directly to the linked Lifeguard tower.

Triton is equipped with advanced navigational technology such as Inertial Measurement Units, Global Positioning Systems (GPS) and Obstacle Avoidance Acoustics. This enables the un-piloted drone vehicle to scout the beachfront, beyond the surf zone autonomously.

The Triton ASV design offers a new approach to shark detection and beach surveillance with better accuracy and efficiency than land-based detection methods and much lower costs compared to aerial patrols. Triton is a superior ecologically option when compared to current shark control programs, such as netting and drum lining as it has a negligible impact on other marine life. Beach users are provided with peace of mind knowing that Triton ASV is reducing the potential risk of shark attack. Triton ASV offers Surf Life Savers an intelligent, unobtrusive tool to aid them in keeping beach environments safe.

### Contact

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### Pictured

1. Triton front
2. Triton with user
3. Triton exploded view
4. Triton system diagram
5. Triton elevations
6. Triton in use



Igen

Igen is an exercise device for young adults who spend long periods of time seated at a computer. It provides physiological benefits of increased leg activity while seated. Sedentary lifestyle is a contributing factor for young adults to become overweight. Igen encourages sedentary adults to increase exercise adherence.

Igen is placed under the desk and in front of the chair when seated. To use Igen, simply place your feet on the pedals and alternately push against the pedals horizontally. The linear action is transformed into a circular action via the flywheel and generator to produce electrical power. This electrical power can be used to charge a phone or other small electric devices by connecting via USB. The LED light array indicates the amount of electricity generated. This can encourage users to keep exercising at a pace sufficient enough to generate electricity. In addition, Igen can be paired with a mobile phone app to record daily exercise activities, provide exercise analysis and reminders to increase motivation.

Igen needs little space and lives under the desk. The low profile linear pedal motion prevents users knees hitting the desk. Igen makes is convenient to fit physical activity into daily life and to increase adherence to exercise.



Contact

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Pictured

1. Igen context
2. User scenario
3. Top view
4. Handle and foldable supporting structure
5. Front view

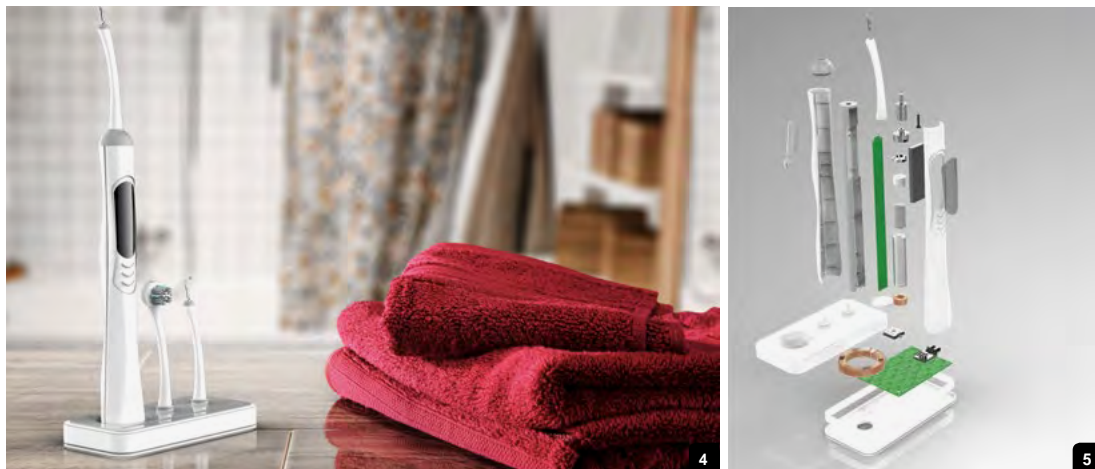


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## MINT

Periodontal disease affects 90% of the Australian population at some point in their lives, while Health experts indicate, '40 percent of surfaces of your teeth are never clean'.

MINT integrates technologies and advancements used by professionals to produce a day-to-day household dental product that will assist in the prevention of advancing oral health conditions.

It is intended for adults to remove plaque from the gingival lining. MINT has the potential to reverse the early effects of gingivitis (recession of the gums).

Through small ultrasonic vibrations MINT breaks down composites of plaque that cannot be achieved with an electric toothbrush. It includes functions to encourage regular use as well as monitoring the amount of plaque present. For safety it has a push back silicone seal.

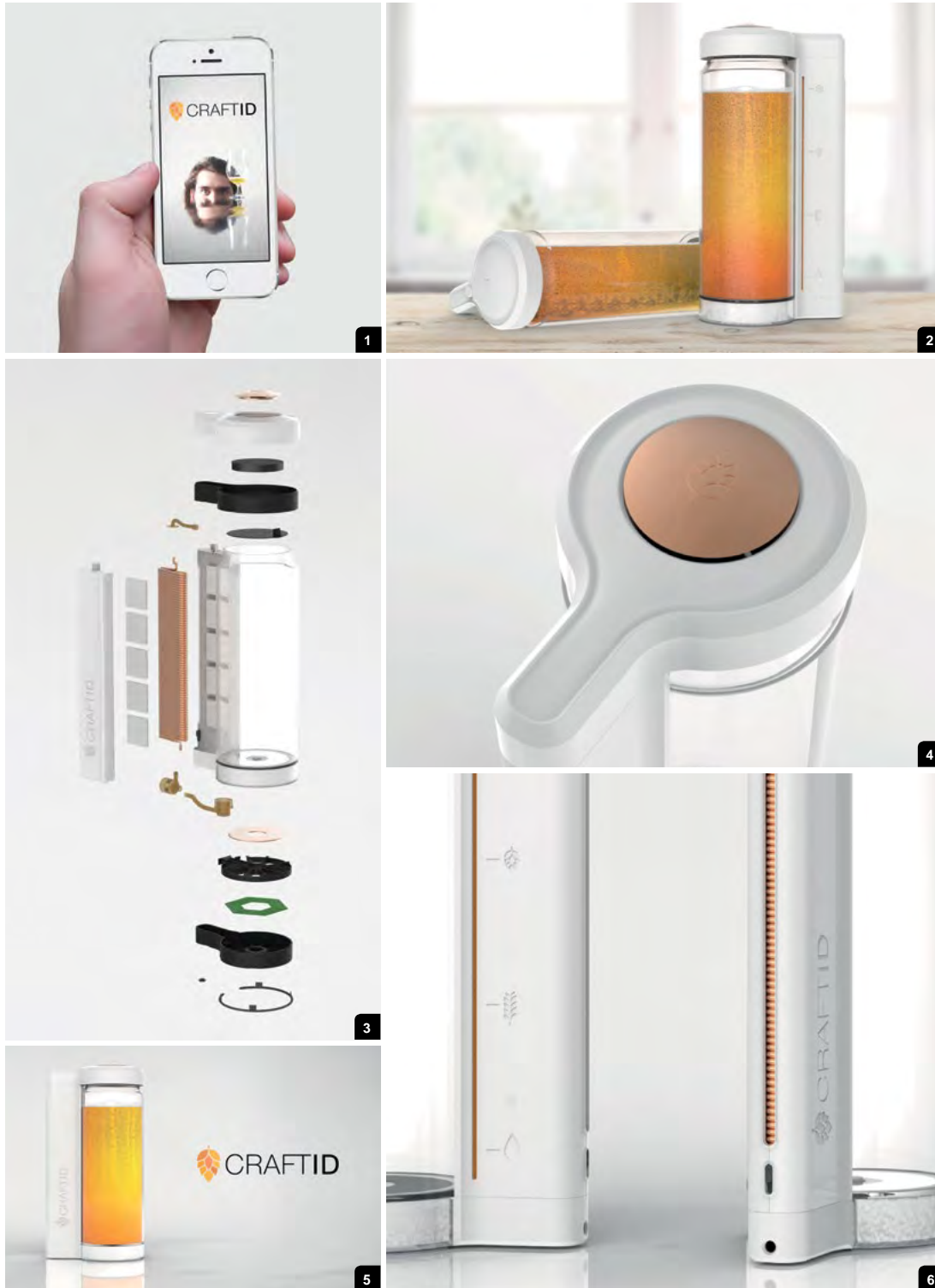
MINT aims to offer results comparable to that of professional products. It encourages behavioural change for better Oral health to improve overall health and the quality of life.

### Contact

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### Pictured

1. Female hero
2. Product details
3. Interface details
4. Product in context
5. Exploded details



## CraftID

CraftID, making brewing your own beer accessible, affordable and easy

CraftID is a compact and easy to use home brewing system that is for both beginners and experienced beer brewers. It simplifies the brewing process by using a single transparent vessel for the entire simplified process. Unlike other brewing systems, the process is kept in the same vessel from fermentation to consumption. This alleviates the requirement for other bulky and assorted equipment. A simplified sterilisation process allows for greater quality and consistency.

The all-in-one appliance interconnects via bluetooth to a tablet or smartphone. A smart phone app leads the user through the semi-automated three-hour process. Built-in sensors and a microprocessor control the heating, mashing, boiling and cooling steps of the process. CraftID preheats the water to save time and prompts the user when to add ingredients and close the airlock via notifications to a tablet or smartphone. The machine uses hot/cold thermoelectric peltier cells, an induction coil and a pump to recirculate the wort as required for the stages of the brewing process.

CraftID produces a six-pack sized keg for less than \$6. Beer can be tapped straight out of the chilled vessel when placed in the fridge.

[www.craftid.com.au](http://www.craftid.com.au)

### Contact

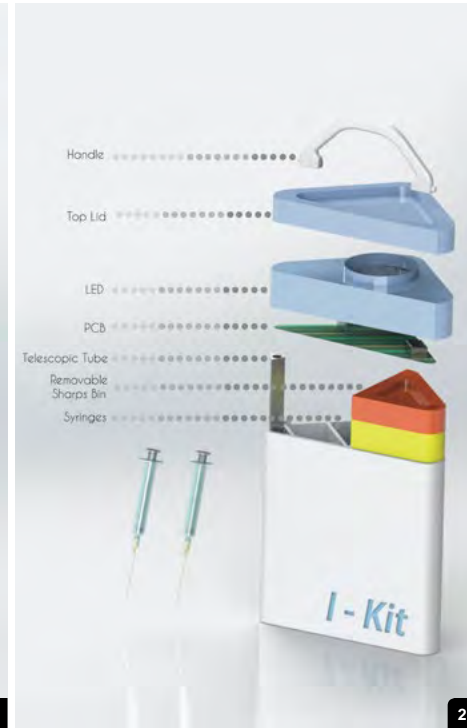
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### Pictured

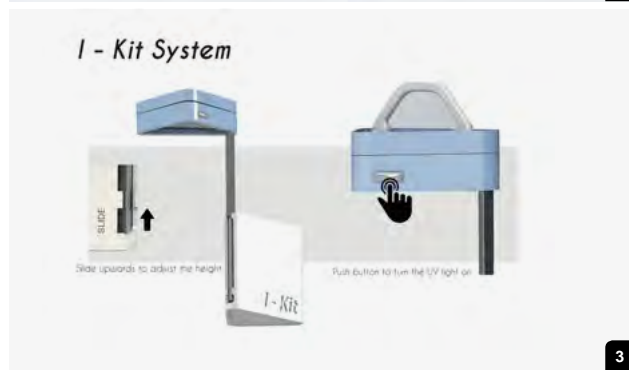
1. Phone application connectivity
2. In situ
3. Exploded
4. Cap detail
5. Enjoy
6. Progress bar/coil detail



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**I-Kit**

For nurses working in hospitals there is always a potential for needle stick injury risk while taking blood or injecting medications. These injuries can occur during any circumstances, however the majority of injuries happen during syringe injection activities. Alternatively, they can occur during syringe disposal.

I-Kit can prevent nurses from incurring needle stick injury by providing an integrated kit at a patient's bedside. A UV light vein detector assists nurses to easily identify the patient's veins and reduce the chances of unsuccessful attempts and patient distress.

The flip up handle helps nurses to carry the injection kit to the patient.

The kit contains a sharps disposal bin, syringe storage compartment, and dressings and accessory compartment.

The UV light vein finder is located on the underside of the lid assembly. This is particularly beneficial while taking blood. It illuminates the patient's arm allowing nurses to detect veins quickly and easily. The lid assembly of I-Kit can be twisted 180 degrees and is adjustable to enable the best comfort both patient and nurse.

**Contact**

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**Pictured**

1. I-Kit open and closed
2. Components exploded view
3. I-Kit system
4. Sliding UV light lid assembly
5. I-Kit in use



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## POD

POD is an intelligent drone deployment system utilising new and emerging technologies, which will positively impact the future for coastal lifeguarding. Integrated GPS technology enables an emergency situation to be located with pinpoint accuracy.

Combining the prompt response and payload capabilities of drones, POD will identify, deploy and deliver specialised equipment to the location of an emergency, as required by the lifeguard. Within the system there is an opportunity to deliver one of six pods, each pod caters for a specific need. Examples of pods, include a defibrillator, first aid kit, airway kit, etc.

The drone is capable of deploying and delivering a payload of up to six kilograms however with the predicted advancement in technologies, payload capabilities and flight times will only improve, benefiting lifeguards and rescue teams alike.

It is important to note that on average, it takes nine minutes for the Westpac rescue helicopter to dispatch from its base and in nine minutes the drone is capable of flying 14.8 kilometres, improving the likelihood of survival for victims who are caught in challenging situations. POD will operate at a fraction of the cost of a rescue helicopter.

POD has been designed using leading edge technologies, enabling an efficient and effective first response. POD will offer rapid assistance to a lifesaver and potentially save a victims life.

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### Pictured

1. Deployment of drone over populous beach
2. Drone deployed to a rescue scenario with a POD
3. POD draw into deployment mechanism of drone
4. Exploded view of POD's components
5. Ready for dispatch – stationary rear view



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## Trackrack

### Modular cycling carry system

Trackrack is a modular carrying system that retrofits to existing rear bicycle racks to expand the carrying capabilities of the commuter cyclist. It makes the bicycle a viable option of transport for commuters whose carry varies daily.

The innovative and robust aluminium extrusion system provides ample space for the use of custom fixing points called 'Bits' - specially designed mounting points for common accessories found in the cycling realm such as tail lights and action cameras. These weatherproof Bits are secured using marine grade hex bolts and t-slot nuts, ensuring strength, durability and security.

Trackrack is designed to be an expandable ecosystem of products – with current Bitt options including a rear light Bitt, a GoPro Bitt and a pair of pannier bag Bits. The Trackrack attire bag addresses one of the most common qualms of commuter cyclists – how to carry a suit to work. The bi-fold suit bag couples with the pannier bag Bits and is custom designed to minimise hardware on the bag.

The retrofit Bits are positioned to existing rear bicycle racks using channels on the underside of the extrusion, enabling the system to be user-replaceable and interchangeable. The unique retrofit system allows for traditional pannier bags to be used in conjunction with the Trackrack system. The front and rear cowl assist in drainage during wet weather riding while also enabling easy removal of Bits and aesthetic capping of the aluminium centre.

The Trackrack system is a foundation for commuter cyclists to augment their carrying capabilities.

### Contact

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### Pictured

1. The base Trackrack system
2. Light Bitt open and in use
3. GoPro Bitt in use
4. The Trackrack attire bag
5. Trackrack system in situ





**INSIGNIA**

INSIGNIA is an intelligent anti-theft smart tag system that allows clothing retailers to take control of the increasing issue of shoplifting in the Australian market.

The system allows retailers to have a greater awareness of the movement of merchandise through the use of RFID tagging. A smart tag alerts retailers when a customer enters the change room and is able to identify what exact items customers are trying on. By having an infrared alarm, any foreign removal devices will activate a system alarm alerting retailers if a tag is being forcibly removed.

The emergence of new sales channels in the retail environment demonstrates the importance of retailers offering customers an ultimate in-store experience. INSIGNIA allows retailers to become involved with each individual customer, as well as providing a quick and efficient checkout system. The main base station functions are to receive information from the change room, scan the garment, deactivate the alarm and remove the smart tag with one simple tap of the tag.

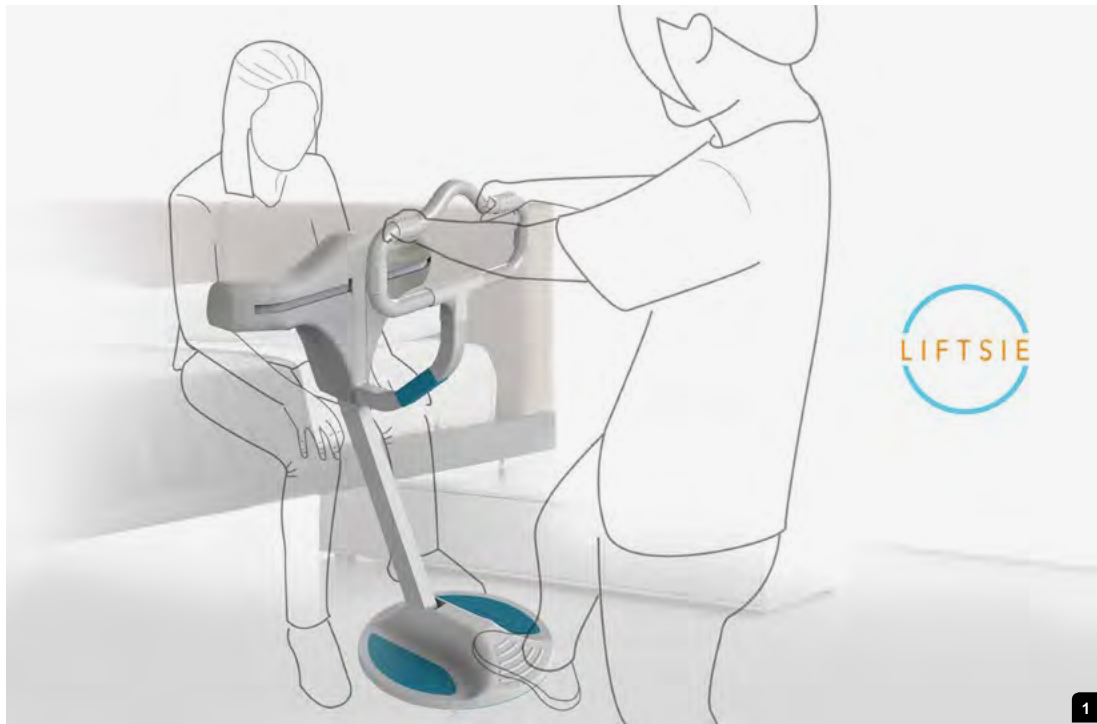
The use of NFC technology will enable customers to simply tap INSIGNIA smart tags with their smart phones and within seconds are provided with information about the product, as well as other stores that have sizes in stock. Real time display on INSIGNIA smart tags allows customers to be provided with accurate prices as well as a more visible display. Growth of omni-channels throughout the retail market has increased the importance in providing customers with a seamless shopping experience from in-store to online purchases.

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**Pictured**

- 1. INSIGNIA
- 2. INSIGNIA retailer iPad interface
- 3. Customer NFC iPhone interface
- 4. INSIGNIA smart tag
- 5. Real time display on smart tag
- 6. Removal of smart tag from clothing



**Liftsie**

Liftsie is an assistive transfer device that reduces the risk of back injury for both the professional or home carer who needs to perform manual transfer of a patient or incapacitated family member.

With the ageing population and a need for better home care, patients and the elderly need to be taken care of in the comfort of their own home by other family members. Liftsie allows both trained and untrained carers to reposition patients from one place to another without the risk of injuring themselves. This device is also designed to help the patients or the elderly who have limited leg strength to independently stand from seated position on a bed or wheelchair.

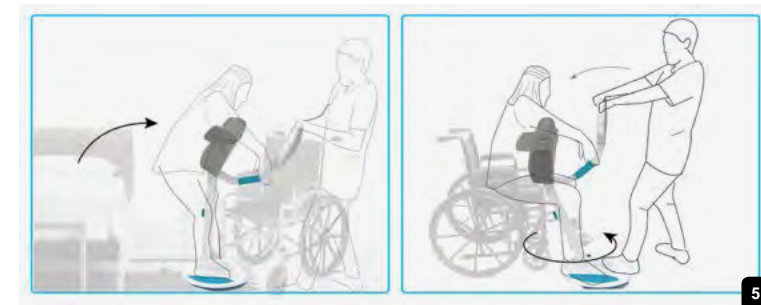
Liftsie reduces hazardous lifting by utilising a pivoting action of a height-adjustable pole. The base of this device also rotates to help move the patient to the desired position. When the carer places Liftsie adjacent to the bedside or chair, the patient then hugs Liftsie and places their feet on the base. The carer can pull the patient up and rotate the device towards the wheelchair or bed and gently lower the patient down.

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**Pictured**

1. Liftsie
2. Rotating view
3. Pivoting and adjustable height view
4. Base assembly exploded view
5. Context of use





Plico

Multipurpose collaborative table

Plico is a multipurpose collaboration table, offering flexible space configurations, and encouraging freedom of movement and creativity. It is designed to support the dynamic workstyles that take place during teamwork and collaboration activities.

The ability to reconfigure the table means it can operate both as a standing desk, accommodating up to 8 people, as well as an easily moveable and foldable white board. With space at a premium, Plico helps get the most utility out of working environments with its space saving dual formation capability. Ultimately, it supports workplace wellbeing by providing the opportunity for people to stand, move, connect and create together.

Plico supports an ecosystem of accessories designed to facilitate collaboration. When the texture of a whiteboard surface doesn't feel right, the attachable paper roll provides a Lo-fi option for recording plans, thoughts, processes, and design ideas.

Additionally, the whiteboard doubles as a magnetic surface creating a platform for a variety of extensions. For example, a magnetic power board can be placed underneath the table freeing up the top surface. The magnetic 'post it' notes means endless pieces of paper no longer get lost in the myriad of other working ideas. And being magnetic, all accessories on the table remain in place – convenient and located in ways that make sense for collaborators.

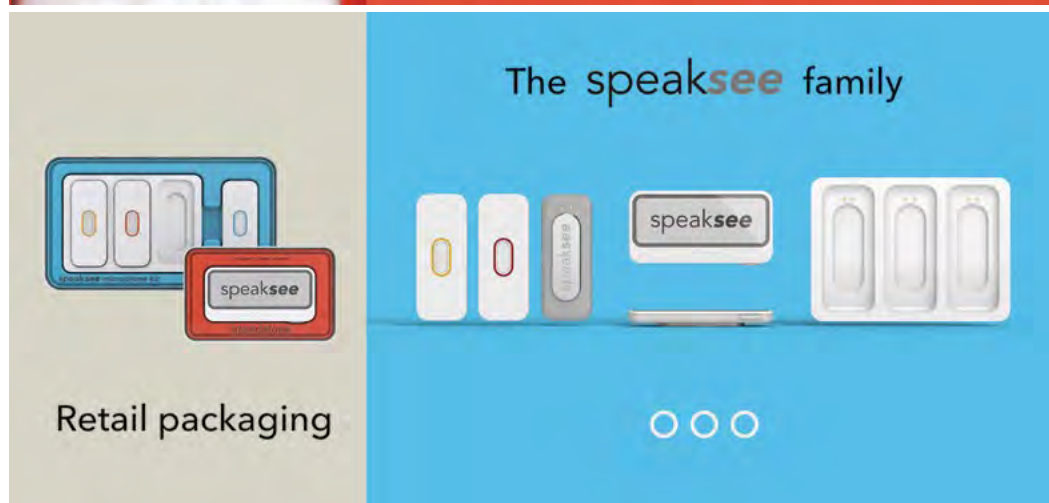
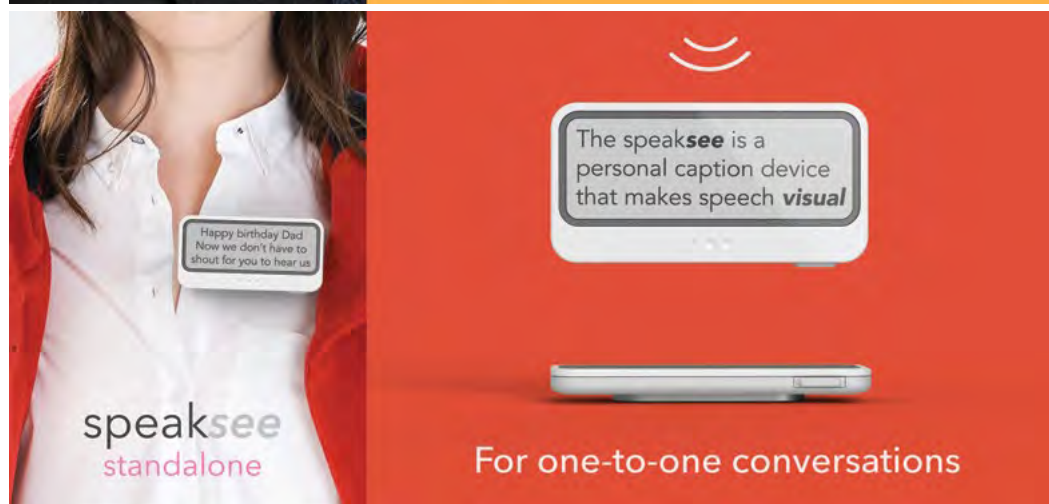
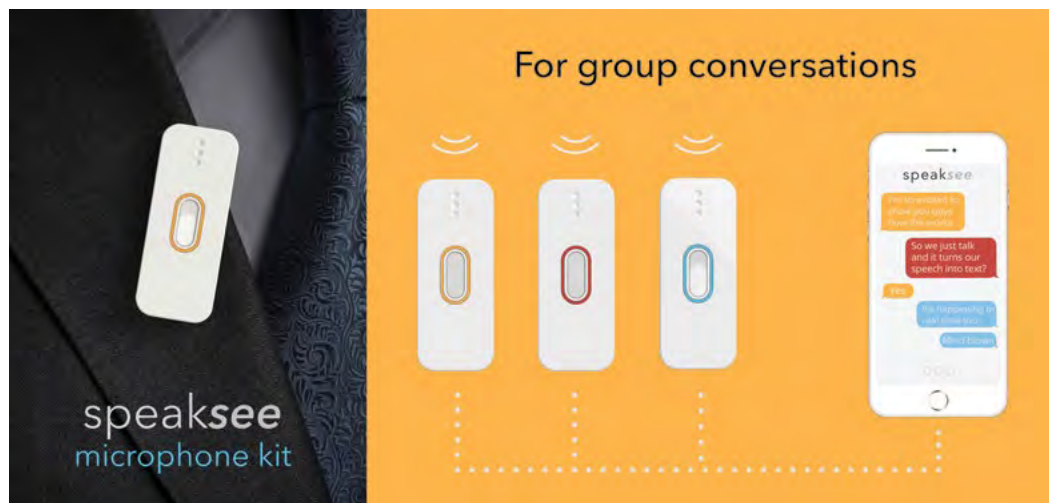
Working environments need to respond to dynamic and agile work practices. For those driven by the collaborative process, Plico reinvents what can be achieved from the humble table. It's a focused furniture piece sure to find favour with architects, designers, and project teams.

Contact

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Pictured

1. Plico in standing use
2. Plico as a folded whiteboard
3. Paper roll accessory
4. Magnetic accessories
5. Folding motion
6. Folded with paper roll and pen accessories



## Speaksee

Speaksee is a kit of wearable bluetooth microphones that uses speech transcription technology to make conversation visual. For those who have profound hearing loss Speaksee dramatically enhances speech comprehension by providing subtitles to group conversations in real time.

The fundamental challenge of effective voice to text transcription is dealing with background noise. This is why speech recognition apps commonly struggle in noisy environments. Speaksee solves this problem through the use of wearable microphones that only hears what the wearer is saying. Multiple people can talk at the same time, and each of their microphones will transcribe what they say, separating their words into different coloured chat bubbles in the Speaksee app.

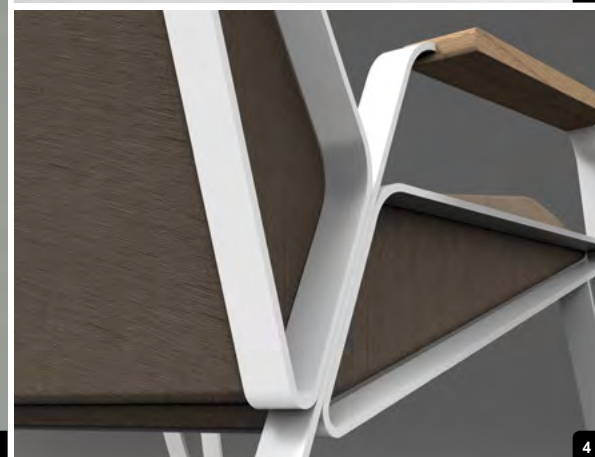
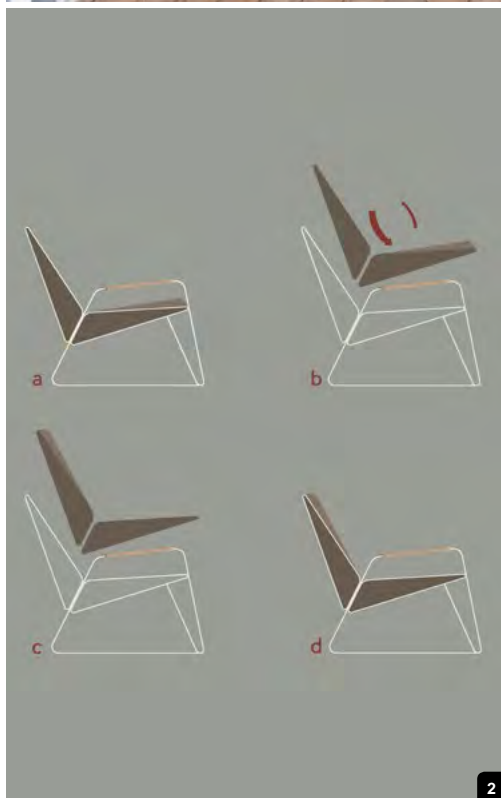
With transcription accuracy of up to 90%, the result is a low cost alternative to cochlear implants, lip reading or sign language. It offers a new way for those who are hard of hearing to easily follow group conversations.

Speaksee can be applied to a range of other markets as well, from providing trackable corporate meeting minutes, to documentary interview transcription, real time university lecture notes and more.

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## Shift Lounge Chair

When it comes to furnishing a home, we tend to think of rooms and spaces as having formulas. That is, lounge + TV = living room and bed + chest of drawers = bedroom. Traditionally, these spaces have a specific function with particular furniture to fit. In recent years, changes in working and social habits have seen these formulas disintegrate.

Shift lounge chair aims to address this spatial fluency. It aims to approach outdoor upholstery in an innovative way through use of a steel frame with interchangeable cushions. Shift allows for dual seating positions. When the larger cushion is placed on the bottom the backrest reclines and offers a lower armrest. By swapping the position of the cushions Shift lounge transforms into an active seating position similar to relaxed task seating. The seat area becomes shallow, the backrest more upright and the armrests higher. Perfect for situations that call for a more formal posture such as informal task work or casual dining.

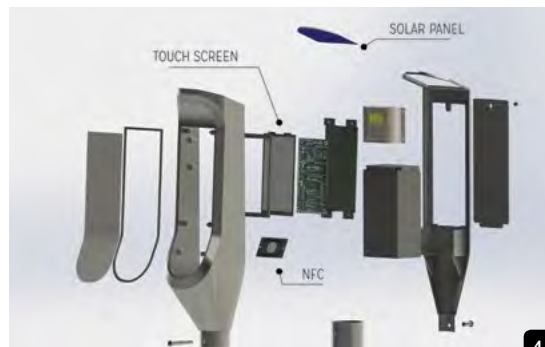
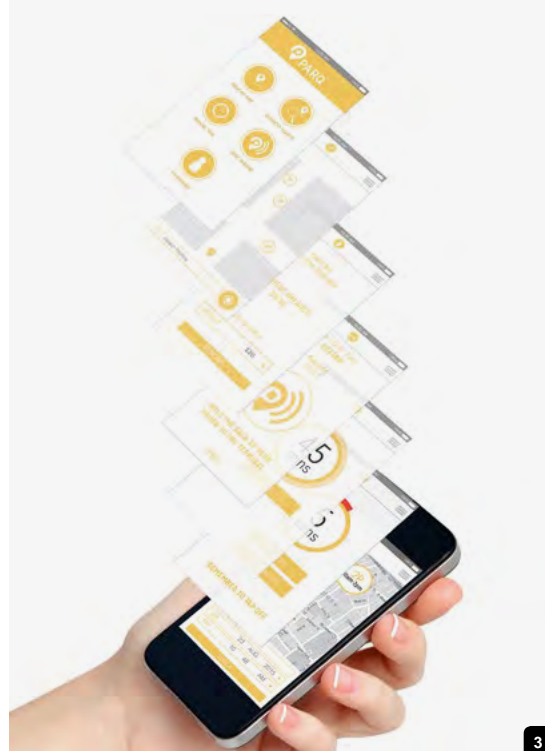
Shift lounge chair is designed to withstand everything the harsh climate of Australia can throw at it. The welded steel frame is powder-coated and the cushions are upholstered in an acrylic fabric that is UV-resistant, colour retentive and water-repellent.

### Contact

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0432 224 907

### Pictured

1. Shift lounge chair
2. Cushion switch directions
3. Side view of different orientations
4. Bent steel axis detail



## PARQ

### Smart on-street parking system

PARQ is an on-street parking system that changes the way people find and pay for parking to most efficiently use scarce parking spaces.

Population increases, and lagging road capacity means cities are struggling to meet people's demand for parking. PARQ aims to maximise limited parking resources by indicating available parking spots through an application installed on motorist's smartphones, and a new metering and payment system simplifies ticketing for users and administration for cities. Users can even use their smart devices to make a payment and receive reminder about remaining parking time.

PARQ uses a tap 'on and off' NFC payment system. Drivers register their personal information such as driver license and car plate license number, meaning there's no need to display or check parking tickets. And a system of 'smart' networked parking meters handles payment, as well as identifying unused parking spots.

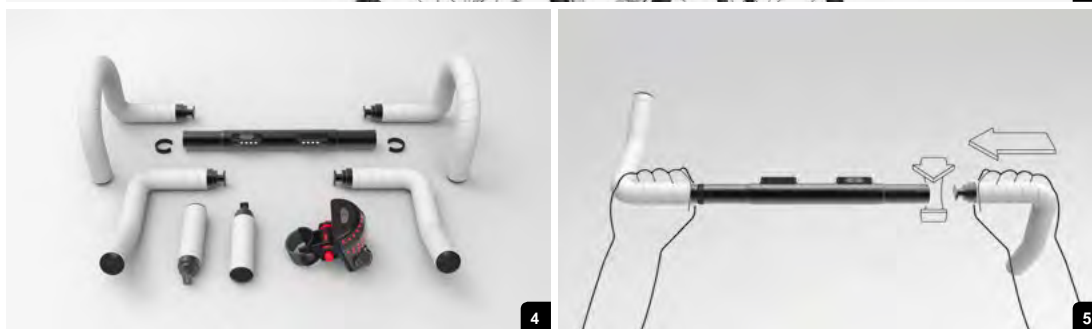
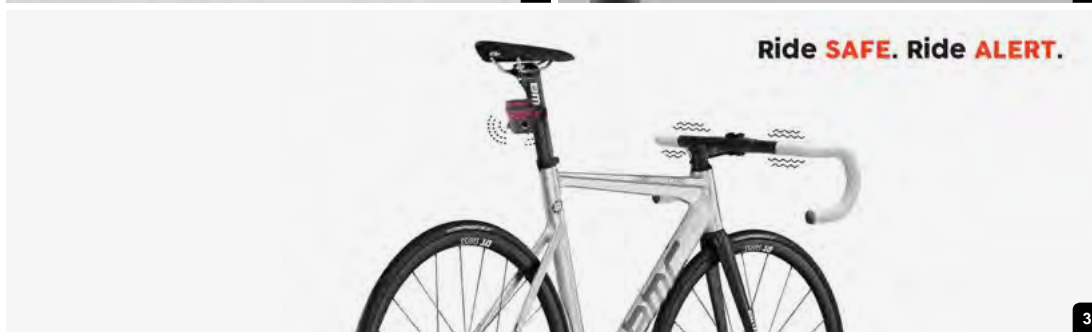
By integrating all parking into one system, it allows city management to monitor parking activities online, reducing the chances of illegal parking in busy areas such as the City Business District, and increasing the efficiency of policing and revenue collection.

### Contact

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0420 316 868

### Pictured

1. Hero shot
2. Parking meter interface
3. Smartphone application interface
4. Parking meter exploded view
5. User scenario



## Ride Guardian

Ride Guardian is a personal safety system for cyclists who commute on busy urban roads. It creates a virtual 'safe zone' and early warning system to protect the rider from the motorists around them. Unlike other cycle safety products, Ride Guardian not only helps the rider feel safer on the road but also enhances the motorist's interaction with the cyclist by creating a sense of spatial awareness.

Ride Guardian consists of two main components, a rear sensor and projection unit, and other an intelligent bike handlebars. The rear unit contains a number of important technologies including a set of ultrasonic range finders and an array of high powered LEDs. The handlebars house a haptic feedback system comprised of LEDs and vibration motors. The ultrasonic range finders in the rear unit work in tandem sensing the distance of approaching vehicles. This information is wirelessly transmitted to the handlebars triggering the haptic feedback system alerting the rider of incoming traffic. The high powered LEDs in the rear sensor are coupled with a lens array to project a curtain of light onto the road surface. This creates a 'safe zone' surrounding the back of the rider. A similar projection system is used in the handlebars but rather as a means for navigation and feedback alerts. Handlebar styles can be interchanged between bull horn, drop bar and flat using a simple twist and lock mechanism.

### Contact

matt.holihan@gmail.com  
0415 084 687

### Pictured

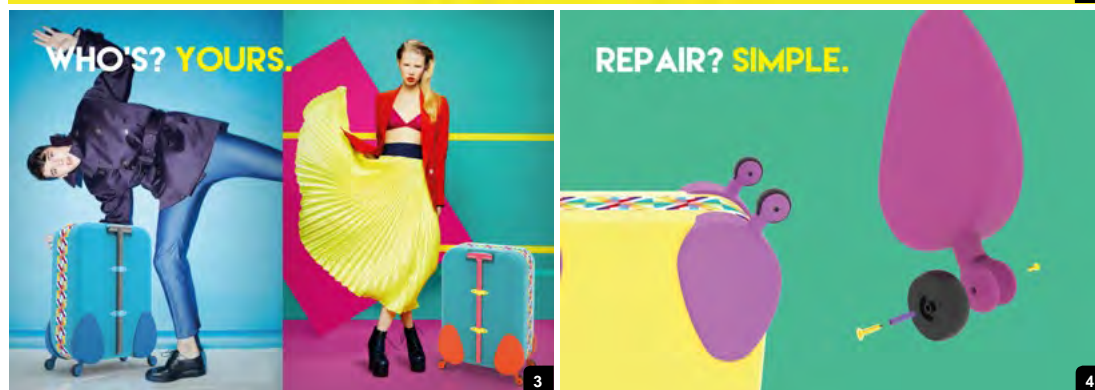
1. Ride Guardian in context
2. Exploded view
3. Haptic feedback
4. The complete system
5. Handlebar install
6. Ride Guardian at night



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## Böken

### Modular suitcase

Unlike existing suitcases, which are not repairable and often end up in landfill, Böken is a modular suitcase system that can be customised to suit changing travel needs, and repaired on the go, for a long working life.

Böken is purchased as a three-part structure however; it can be assembled in a variety of different ways. The three parts consist of two hard-cases and one fabric insert. The largest configuration uses the three inserts, equivalent to a conventional medium-sized suitcase. Using only the two external hard-cases provides a Lite option, suitable for weekends and short domestic trips. And lastly a Hybrid option using only the rear case and fabric insert, creates a backpack mode which is perfect for camping trips, cruises or any other kind of travel.

Böken encourages the user to repair the suitcase themselves, by giving them the tools and resources to do so. The package includes a Philips head screw-driver and single screw mechanism to connect the suitcase parts together. This also means the user has the opportunity to customise and upgrade the suitcase as their travel needs change, with a range of different options and styles available.

Böken gives the consumer ultimate control over the configuration and style of their suitcase, whilst reducing the impact of unnecessary wastage.

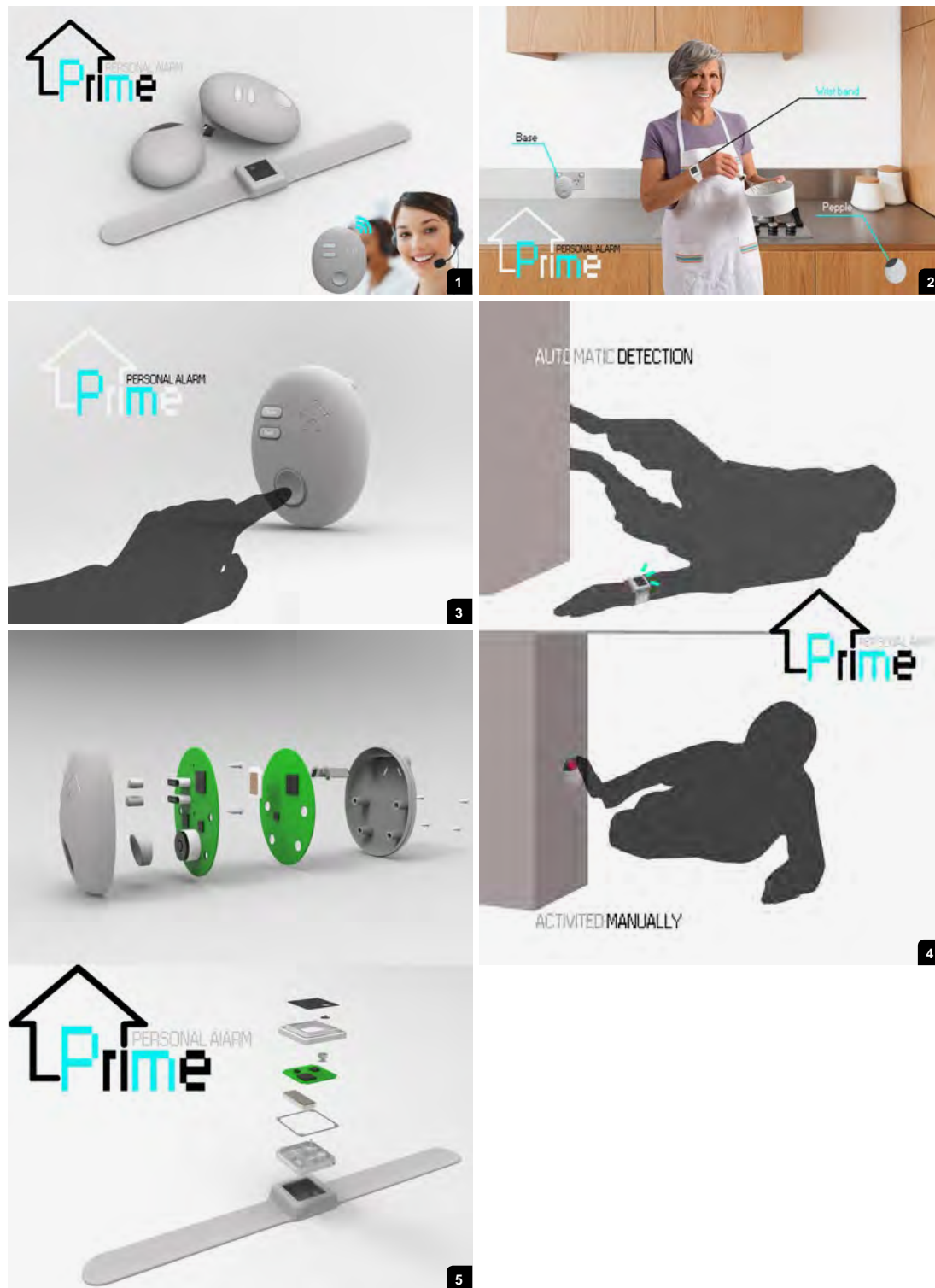
### Contact

showard\_92@hotmail.com  
0401 946 153

### Pictured

1. Böken hero shot
2. Böken, Böken Hybrid and Böken Lite versions
3. Consumer has ultimate customisation control
4. Easy repair, one sized screw and to join all parts





## Prime

Prime is a personal alarm designed for elderly people living alone who are at risk of falls. It enables them to contact emergency services when they are in danger. Unlike existing emergency alarms, which must be worn by the user and may not be activated if the wearer becomes unconscious, Prime can detect the falls and contact emergency services automatically.

The Prime system includes three parts, a plug in base device, a quick fit slap wrist band and several wall sensor pebbles. The wall sensor pebbles can be placed in each room where they may be needed. In the wrist band, an accelerometer sensor can detect a change of wearers' orientation, monitor a fall and generate an emergency alert to the base unit which phones emergency service. The base unit receives emergency information from wrist band or the pebble alarms via Zigbee wireless protocol. This provides stable low energy communication up to 200 meters between the devices.

Overall dimensions:

Base: 80 x 66 x 52

Wrist band: 30 x 250 x 12

Pebble: 63 x 52 x 23

Material: ABS, silicone, rubber, aluminum

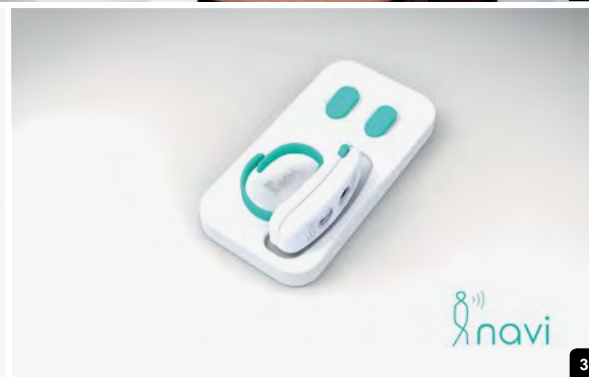
### Contact

xiaoyanhuang91@gmail.com

0450 512 923

### Pictured

1. Prime
2. Installation instructions
3. One-key operate
4. User scenario
5. Exploded view



## Navi

### Assistive device for low vision

Navi is an assistive device designed to help people with low vision. This wearable device enables the user to navigate and avoid obstacles by receiving taptic feedback. Navi consists of a waistband and two armbands that the individual wears underneath clothing. The device consists of an ultrasonic sensor and four taptic engines, which vibrate when the user is within a meter of obstacles. The taptic feedback guides the user in directions by vibrating on the corresponding side of the obstacle so the user can avoid collision.

According to Vision Australia there are about 357,000 people in Australia who suffer from low vision and blindness. It has been estimated that this number will grow to 564,000 people by 2030. Those who suffer from low vision may have restriction in range and variety of activities, restriction in capability to get around and less control of the environment they commute in. These limitations can affect everyday tasks such as the daily commute to become harder to perform, which may lead to a low self esteem, dependency on others and isolation.

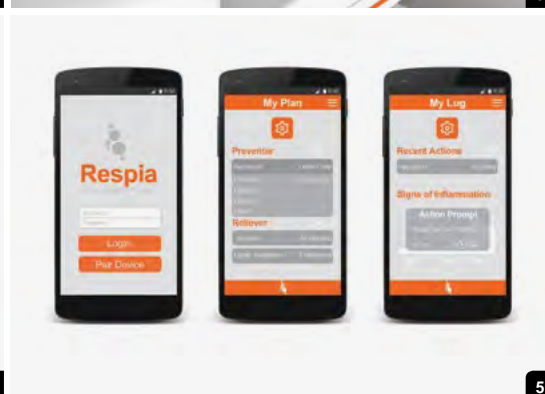
Since Navi is a discreet device worn under clothing, it helps dissociate individuals of low vision from the stigma attached to visual impairments. This can help individuals of low vision to gain back their independence and perform their daily commute with more confidence.

### Contact

anajfard@yahoo.com.au

### Pictured

1. Navi is discreetly worn under clothing
2. Navi assists the daily commute
3. Navi on charging dock
4. Exploded view of navi



## Respia

### Asthma management system

Respia is an asthma management system that tracks and records the wearer's respiratory health and medication usage. The system is tailored to adults living with asthma who experience the mental strain of constant self-monitoring and are prone to misdiagnosing their own condition. Inaccurate self-evaluation causes poor decisions on when to medicate and which medication to use.

Respia aims to solve this by aiding in the decision making process to improve long term management of asthma. The system consists of a bluetooth equipped inhaler, patch and docking station. The wearable patch provides live haptic feedback and suggestions to help the user stick to their personal asthma plan. The product does this through acoustic sensing in the wearable patch. This adhesive patch sits on the skin similar to a stethoscope and monitors changes in the upper respiratory tract. Airway inflammation is indicated by changes in inspiration/expiration ratio, air flow, frequency of wheeze and other acoustic cues which are tracked by the patch and recorded via the smart phone app. When there is indications of a worsening asthma condition the patch will vibrate twice to let the user know it is time to take reliever medication.

The Respia inhaler tracks and records inhaler use. This information is stored in the smart phone app notifying the user if they have missed their daily preventer medication. The LED matrix shines through the plastic indicating number of doses left in each canister or if the inhaler needs recharging.

### Contact

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0404 966 741

### Pictured

1. Respia charging dock
2. Respia asthma monitor and inhaler
3. Dosage indicator LED matrix display
4. Inhaler exploded view
5. Mobile app interface



## Salvus

### Firefighter safety management

Salvus is for firefighters whose safety is at risk when tackling bushfires. It is a physiological monitoring and communications system that observes a firefighters' vital signs. Using biosensors it warns of danger to their wellbeing, and help incident controllers better manage people at the fire front.

This design uses a novel location for wearable biosensors whereby the device is mounted onto standard issue firefighters gloves. A pulse oximeter and heart rate sensor, commonly used in medical applications, are at the heart of the device used in conjunction with existing metadata to extract information relevant to a firefighters' wellbeing. Through real-time data analysis, overexertion and firefighter stress can be monitored, allowing for appropriate intervention to prevent emergencies and manage personnel.

A blinking coloured light located above a monochrome OLED screen indicates the exertion status of the firefighter. A 'blue' light indicates a firefighter's vita signs baseline are operating normally. Short-term bursts of exertion move into the 'yellow', whilst a firefighter operating in the 'red' is experiencing sustained stress that should be removed from the fire front. A distress alarm is then activated to alert others in proximity.

The glove-mounted device is unobtrusive. An efficient docking system with a release lever and oversized buttons allows for easy operation given the limited dexterity while wearing gloves.

Salvus can improve safety for firefighters by providing improved monitoring and support better risk management decision-making on the fire ground.

### Contact

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0451 511 599

### Pictured

1. In context
2. Location of biosensor
3. Feedback based on real-time data
4. Manage the wellbeing of your crew
5. Quick release mount and lock mechanism



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### Sentinel Surveillance

Sentinel Security Surveillance System is an advanced retail surveillance system, designed for all retail environments prone to theft. It is designed to track current RFID tags and identify these tags through a camera and RFID sensor.

Sentinel Surveillance is designed to work in conjunction with current existing RFID tags. Each item in the retail environment will have its own unique RFID code that can be tagged by the Sentinel system, which is located in key locations in the retail environment such as outside change rooms, register and entrance.

As an item passes into these locations it will be tagged and real time data will be sent to an interface accessible by employees, who are then able to act accordingly. When a RFID tag is taken off the item or signal is lost, the system identifies the individual responsible, tagging the individual and taking photos that can be passed on to the proper authorities.

The system is also able to assist with basic tasks such as inventory management and customer enquiries such as pricing, stock levels and customer orders.

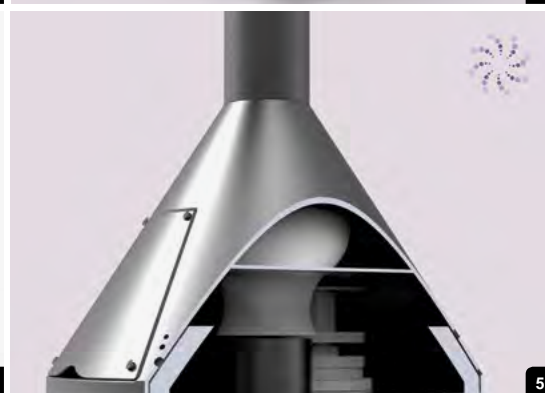
With this system retailers will be able to track theft easily and employees can act in faster to deter theft, and can identify repeat offenders to help prevent future incidents from occurring.

#### Contact

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0430 129 223

#### Pictured

1. Hero shot
2. User context in store
3. User context at entrance
4. User interface
5. LED key



## Aria

Aria is a powerful and lightweight hairdryer that incorporates a trolley in a professional salon environment. Designed to achieve a healthier work environment for hairdressers, this project creates an ergonomic hairdryer by relocating the motor from the hand tool to the pole base that also supports a storage and workbench. This design also enhances performance by increasing the power of the motor without worrying about weight.

Hairdryers are the most used hand tools in hair salons and are one of the heaviest. This can cause hairdressers to suffer from various muscular disorders, due to the weight and poor ergonomics of the product. There has been little effort to fix such problems because most hairdryers are designed to fit a domestic environment. Aria is exclusively made for hair salons.

By simply removing the heaviest component of the product, Aria becomes a much lighter hairdryer. The hand tool (the hairdryer component of the design) contains only the heating elements. By increasing the power of the motor Aria becomes the much more powerful as well as offering extra features such as a workspace.

### Contact

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0457 110 457

### Pictured

1. Aria hero shot
2. Rack details
3. Aria hairdryer detail
4. Aria ergonomics
5. Motor detail



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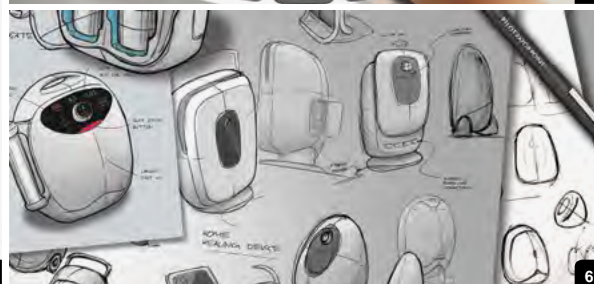
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## Vita

Vita is a revolutionary haemodialysis machine that answers the need for life sustaining haemodialysis treatment in water and resource scarce areas. As rapidly rising kidney disease rates continue to place increasing pressure on healthcare systems and governments worldwide, millions of patients in remote areas continue to experience poorer treatment outcomes, lower survival rates and phenomenally inconvenienced lifestyles. Vita breaks a multitude of barriers associated with traditional haemodialysis treatment including excessive resource consumption, poor usability, high costs and aims to set the standard for the haemodialysis patient experience.

Vita can operate untethered from any power or water source and offers a unique and simple treatment interface that aims to; reduce training times, increase uptake of independent treatment, expand treatment opportunities and subsequently reduce the associated resources and costs.

Vita's treatment setup has been meticulously simplified to a 'plug and play' system of 5 main components which is mated seamlessly to a clean digital interface. A variety of automatically engaging safeguards ensure that treatment safety and quality are in no way compromised. Through the use of refined sorbent haemodialysis technology, Vita requires a mere 6 litres of water per treatment, obtained from almost any source as opposed to current machines which require hundreds of litres of ultra-purified water. The nature of the device simultaneously opens up treatment opportunities beyond remote regions to include particular scenarios in developing economies, emergency situations and travel.

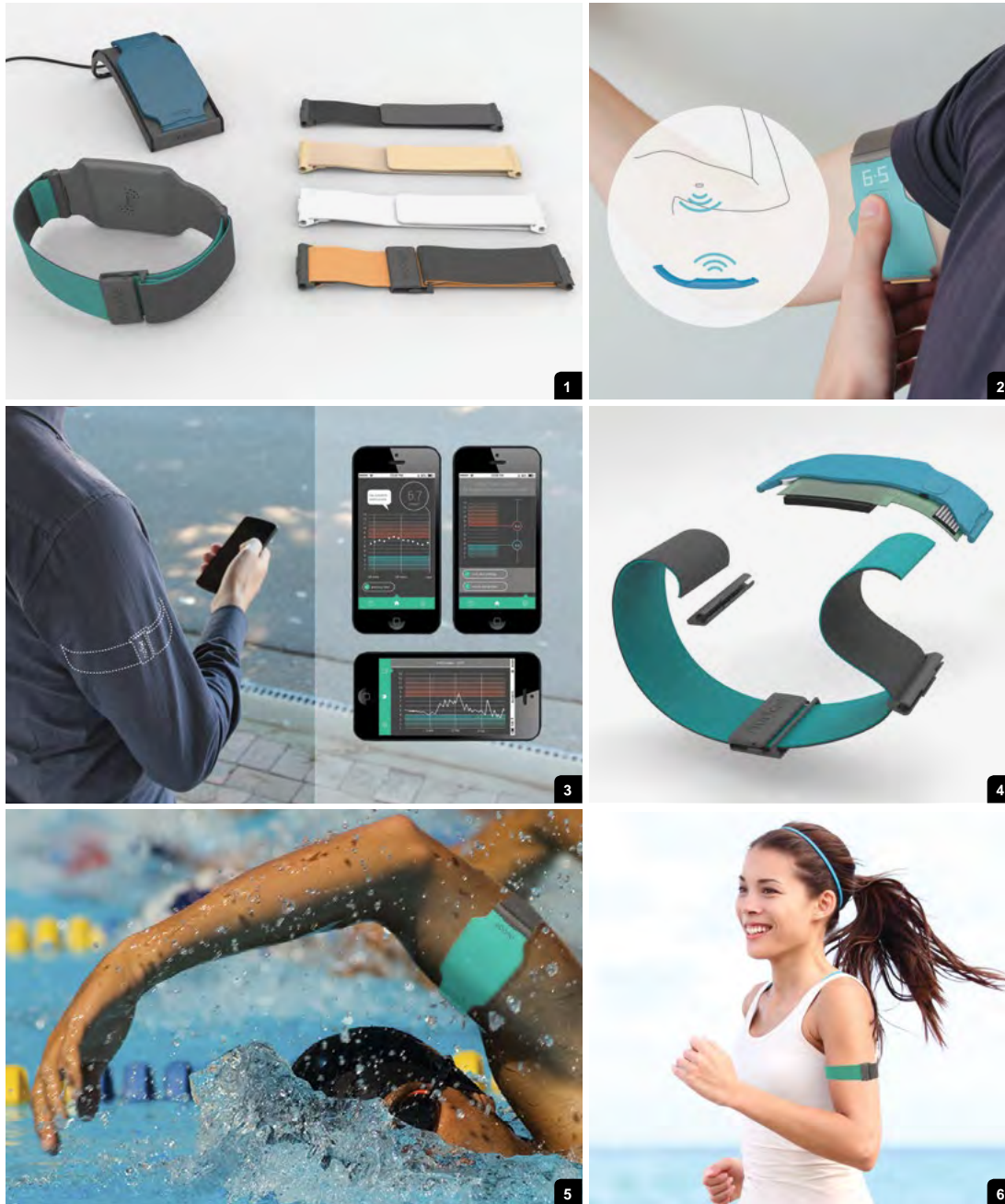
Simple, economic and pleasant. Vita offers a solution to kidney failure that the world needs and which patients deserve.

## Contact

marcus\_l\_93@hotmail.com  
0431 609 301

## Pictured

1. Vita hero shot
2. Exploded view
3. Easy setup and use
4. A smarter, cleaner interface
5. Expanding treatment opportunities through portability
6. Design conceptualisation sketches



## Nudge

### Continuous glucose monitoring

Nudge is a discreet and personal way to prevent high and low glucose levels in active type 1 diabetics without the use of a needle type sensor.

During exercise, diabetics experience a more rapid change in glucose levels than normal. However, their body is incapable of handling glucose levels on its own and this makes many sport and leisure activities a scary or daunting task. The best way to start making this task easier is to provide a continuous flow of glucose readings during their activities and allow the user to prevent problems.

While existing products do provide a continuous flow of information, Nudge is the first to be designed for those who are active. Nudge:

- Provides glucose readings on the worn device, as well as a smartphone
- Is completely waterproof
- Has no risk of being torn off or out of the skin during an activity
- Uses no needles and no medical tape
- Doesn't brand the user as a sick person
- Allows for the user to take the device off and put it back on with ease
- Uses an implanted sensor that lasts 1 year and is inserted by a medical professional, rather than a needle-type sensor that is inserted by the user every 5 days. This reduces user error, as well as medical waste.

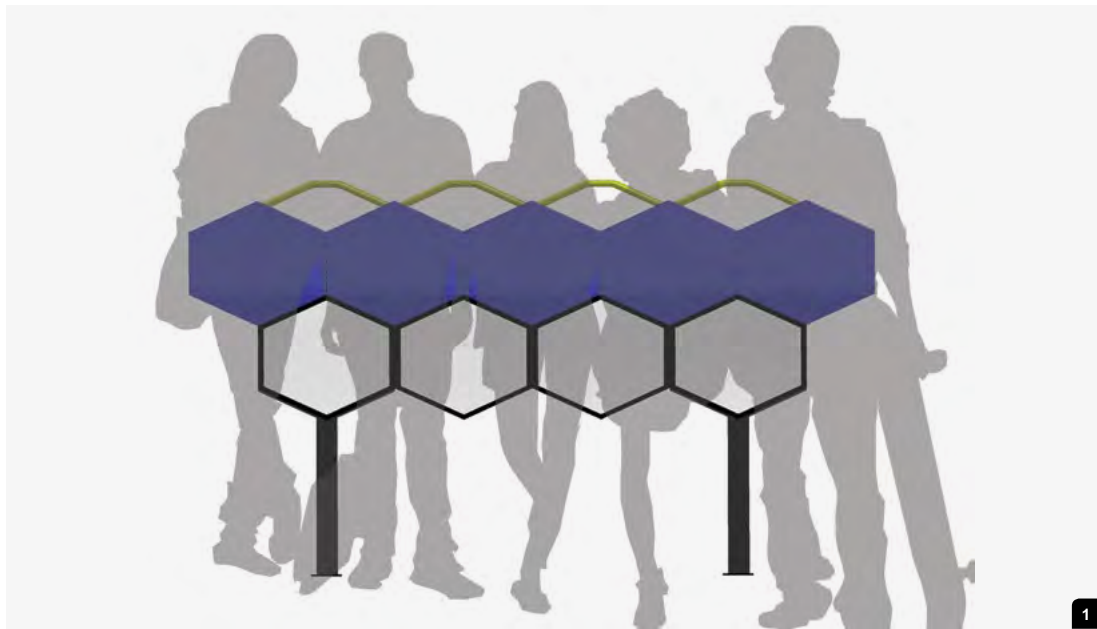
### Contact

[amy.j.leedham@gmail.com](mailto:amy.j.leedham@gmail.com)

### Pictured

1. Nudge starter kit
2. Implanted bio-sensor
3. Nudge app
4. Exploded armband
5. Swimmer wearing Nudge armband
6. Runner wearing Nudge armband

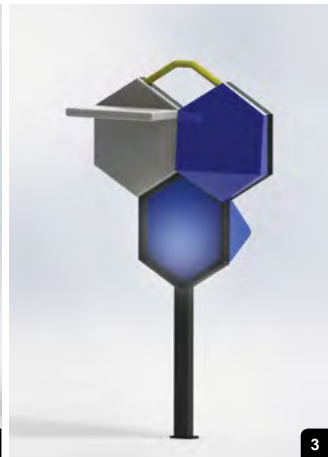




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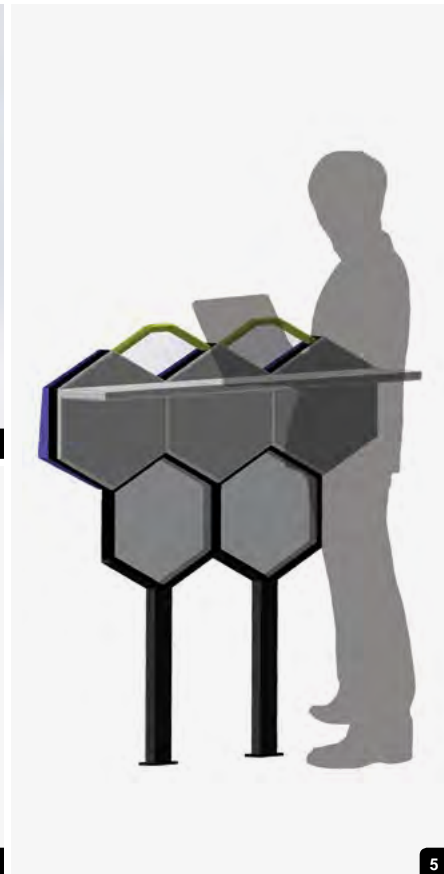
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## Lacuna

### Public transport furniture

Many Sydney public transport commuters find themselves packed in a peak hour train, uncomfortable and unbalanced and unable to use that time effectively. Lacuna is a suite of train furniture that focuses on peak hour commuter travel passenger comfort. Lacuna provides facilities suited to a range of commuter activities by offering a greater opportunity to choose how to spend the time.

The Lacuna furniture architecture consists of a scalable frame with themed stations of Lean, Perch and Work. These options cater to the most preferred activities of commuters. It provides a back rests for leaning, a perch seat for resting; and a bench space for working.

The Lacuna has a smaller footprint than current train seating. This provides more room as well as the sense of open space and encourages passengers to move further into the carriage.

The perch seating allows passengers to take the weight off their feet, whilst maximising floor space for increased capacity and accessible stowing of belongings.

Lacuna is ideal for retrofit into the existing train fleet. The reconfigurable form is unconstrained by the size, shape and layout of the various carriage types in use. It is a single solution that can be customised and lends itself to rapid deployment and easy repair.

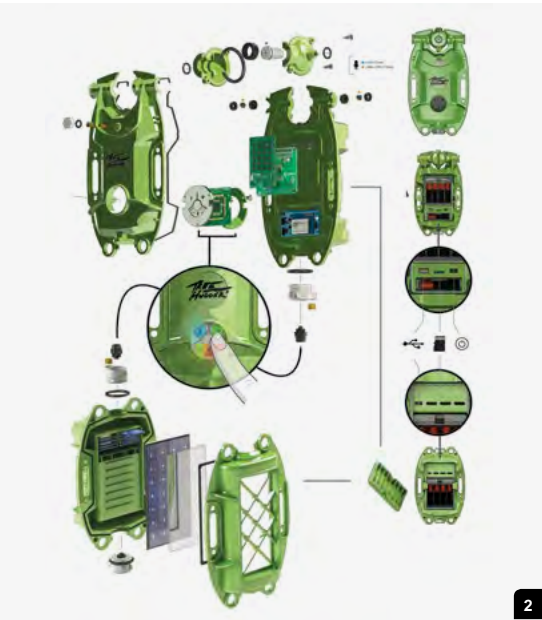
By making improvements to the existing infrastructure, Lacuna provides a feasible and scalable solution for today's commuters today, as well as preparing for Sydney's future growth in public transport use.

### Contact

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### Pictured

1. Cluster of back rest stations in use
2. Perch station
3. Rest and work stations
4. Perch stations in use
5. Bench station in use



## Tree Huger

The Tree Huger is an acoustic monitoring system that allows biological activity to be tracked unobtrusively in outdoor environments. It is ideally suited to surveillance over broad areas and timescales, where efficiency and stealth are required. Once deployed, it has the capacity to record audio remotely and enable constant WIFI access that can run months at a time.

Tree Huger is designed for both precision and outdoor durability. It incorporates weatherproof microphones with adjustable heads and high-performance high fidelity sound cards. Extension units that can be chained together can to extend battery life. These also feature front-mounted solar panels that can assist recharging batteries. Tree Huger is mounted with straps to secure to trees or other objects.

When connected either wirelessly or via USB, the device can be controlled through an app on any smart device or laptop. Features include the ability to customise recording parameters, and network other devices in range.

Tree Huggers network together by Bluetooth or WIFI. This can be used to create a matrix to pinpoint and display the origin of sounds in real-time. By triangulating signals the system can track movement in visually obstructed environments, such as a forest, or during nightfall.

Tree Huger's capabilities improve monitoring in fields diverse as biology research and crime prevention.

### Contact

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0421 965 350

### Pictured

1. Tree Huger in the wild
2. Tree Huger exploded view with internals
3. Using smart device to downloading recordings
4. Using a Tree Huger array to track animals
5. Connect an iPad, customise recording parameters
6. Sketch development of the Tree Huger

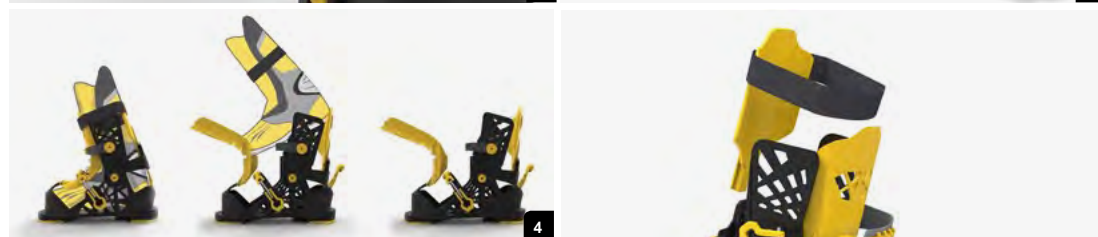


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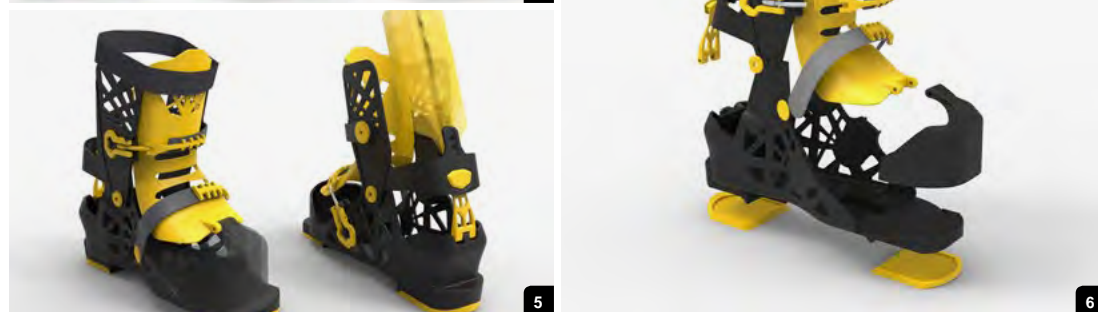


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## Exoversa Ski Boot

The pain experienced due to walking or skiing for extending periods in ski boots is familiar to all who have skied. It was this discomfort that formed the catalyst of inspiration in which the Exoversa ski boot developed. Exoversa is a unique ski boot system that is tailored for the developing skier and it improves the fit, comfort and usability for each skier. Unlike conventional ski boots, the Exoversa is an exoskeletal design that covers a regular snow hiking boot. This allows the user to enjoy the comfort, support and use of hiking boots, whilst easily interchanging between walking and skiing. Exoversa allows the user to combine high performance skiing experience with all other winter activities such as snowshoe hiking, sledging or a walk through the village after a great day of skiing.

The Exoversa is aimed at the rental ski market. Therefore it is designed to be sturdy and adaptable. Through the repositioning of both the toe cap and rear spoiler the boot can be adjusted in length and height, improving fit and decreasing the inventory of the ski hire operator.

The Exoversa is also designed for complete disassembly as the forces and strains of skiing inevitably cause stresses on the boot and, with a simple screw system, each boot component can be replaced individually, extending the overall lifetime of the product.

### Contact

alexgarradmorris@icloud.com  
0405 097 349

### Pictured

1. Hero shot
2. Detail view
3. Ideation
4. Stepping in and out of Exoversa
5. Adjustable toe cap and rear spoiler
6. Exploded view



## Mook

Mook is an affordable personal cooking solution for people living in shared accommodation, who want to cook their own meals without letting odours fill the house. It uses an innovative range-hood, based on impeller technology, to bring air filtration to bench-top cooking, without impeding visibility of the food being prepared.

Mook is an affordable option for users through multi functionality of air filtration and cooking to aid users through the entire cooking process. Using less material in the plastic housing and a circular cooking plate allows for efficient use of space, built around the shapes of small saucepans to larger fry pans.

Space efficiency is a key part of this product as the environment it is designed for is smaller than most, Mook also folds down for storage.

Through the innovative technology of impellers, Mook is able to provide users with visibility of the dish they are preparing whilst cleaning and extracting air from the scene. Odors are pulled up from the cooking surface up through the filters and are extracted out cleanly into the environment.

With the specialised designed impeller blades facing forwards in the motion of rotation, a high volume of suction is provided at much lower RPM than expected, allowing the product to be quiet and efficient.

## Contact

rtrdesigns@hotmail.com  
0435 164 987

## Pictured

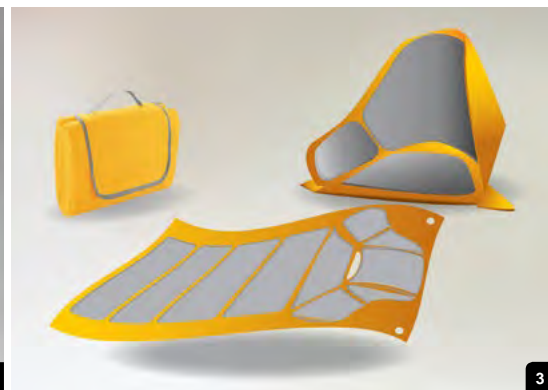
1. Mook
2. Visual clarity of Mook
3. Air suction and filtration of Mook
4. Exploded view
5. Mook at home



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## Komorebi

Lively and vibrantly coloured, Komorebi is an adaptable piece of furniture that is easy to pack and go. From the simple picnic mat in two colour options and easily transportable, it converts from a low folding chair to a lounge chair with a few folds. Inspired by the art of origami, it can be folded into a variety of shapes including a two-seater lounge chair and a floor mat. Unlike other portable furniture, Komorebi brings both softness and rigidity into the same design.

It is made up of several layers stitched together. The exterior cushions are upholstered with a smooth Waterproof acrylic canvas Docril Nautica with polypropylene and 12mm thick ethylene-vinyl acetate (EVA) foam.

The exterior fabric is a PVC coated polyester finish that is waterproof and tear resistant, ideal for the outdoors.

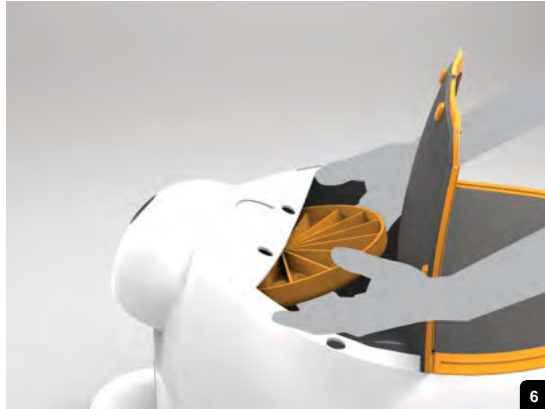
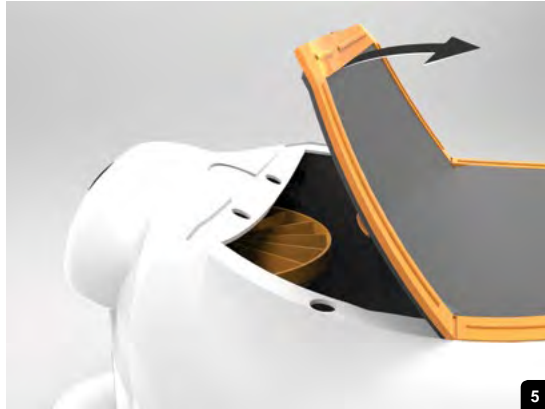
The dual-toned concept reflects the origami's foldable and playful nature. It also has storage for a bottle of water, a magazine and book on the arms of the chair. Each panel has a fold that makes changing the shape easy. Its versatility makes this piece of furniture perfect for social settings such as a festival, picnics and beach days.

### Contact

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### Pictured

1. User scenario
2. Hero shot
3. Product use
4. Progress work



## Alpha

Alpha is a monitoring and activity stimulating console for small to medium sized dogs within the household. On average 50% of dog owners leave their dogs at home unattended and consequently unstimulated for 1–4 hours a day, resulting in short and long term behavioural issues.

Alpha seeks to modernise and assist in forming long lasting relationship with our dogs by mimicking the ritual of fetch. The concaved silicone bed easily receives a tennis ball dropped by the dog. Once the PCB recognises the weight of the tennis ball, a treat will be dispensed at the front via a turntable to reward the dog, training them through positive associations between the action and a high value treat. The ball is then propelled by two spring loaded pistons, prompting physical activity from the dog.

Furthermore, Alpha can be easily cleaned from the slobber accumulated on the tennis ball over time, by simply wiping down the silicone bed. The removable treat tray is machine washable and easily accessed from the top by lifting up the silicone bed clasp.

The camera at the front also allows for peace of mind to dog owners by providing the opportunity to see their dog in real time at the convenience of their smart device.

Unlike other products on the market, Alpha utilises modern technology to simulate an instinctual and universal bonding method between humans and our best friend.

### Contact

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0404 608 529

### Pictured

1. Alpha
2. User interface
3. Ball on silicone bed
4. Propelling of ball
5. Top silicone clasp
6. Removal of treat tray



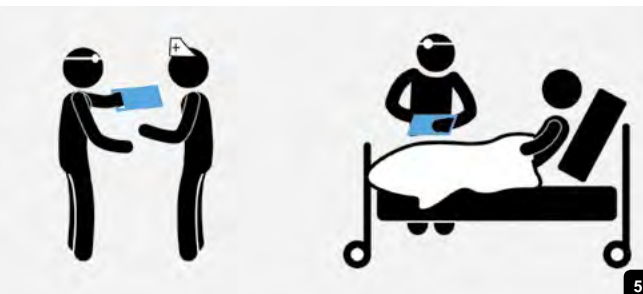
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## Medconnex

Medconnex revolutionises hospital bedside treatment by transforming Medconnex is a bedside information system that enhances patient care through the coordination of a bedside node and small bio-sensing wristband devices. The networking capabilities of the medconnex system allow patient results to be updated in real time and involve the patient with their treatment. This both reduces medical staff's workload and the risk of common human errors.

Medconnex is capable of reordering medication, photographing wounds for documentation, altering patients' prescribed dietary and allergy information, as well as displaying treatment schedules and discharge instructions. All this functionality is carried out by an inbuilt microprocessor, camera, Bluetooth, Wi-Fi, RFID and NFC, which feeds into eHealth IT systems. Greater care for patients is possible through better doctor management plus reducing medical staff's responsibilities and a more efficient hospital.

The information is linked to the patient through a personalised electronic wristband, via a unique ecg reading of their heartbeat. This biometric reader and RFID identification band ensures the correct patient is receiving the correct care. Emergency alert functions can be used to indicate if a patient has been out of bed for a prolonged period.

For medical professionals this offers better efficiency of hospital resources and management of patient care and hospital IT systems.

### Contact

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0432 008 599

### Pictured

1. Unique electrocardiogram reading to identify patient
2. Medical staff using Medconnex to collaborate
3. Patients view of Medconnex
4. Exploded view
5. Confirm – collaborate – communication



## AIRSAFE

### AIRSAFE

AIRSAFE is a child restraint for children up to the age of 6-years old that allows for fast and simplified installation in commercial vehicles, such as taxis. Conventional child restraints might be effective in reducing the risk of injury, but they all maintain the status quo in being large and cumbersome. This has led to a slow uptake in taxis supplying these life-saving restraints, leaving parents unable to protect their children. AIRSAFE is designed as an effective solution for drivers and parents alike.

Able to be retrofitted to any vehicle, the system uses mounting points installed within the rear seat base, to supply power and information to the restraint.

The harness is designed for maximum safety, using greater surface area than conventional harnesses it distributes forces more evenly. Supplementary to the harness, the seat includes integrated thorax airbags. These offer superior protection from side impacts, able to adjust to varying levels of severity, using cold gas inflators that produce less heat than conventional inflators.

Quick release handles allow for quick removal of the seat, and LEDs indicate the status of the airbags, with a solid glow showing that the system is fully active.

For improved hygiene the cushion is made from Integral™ skinned foam, which is waterproof and easy to disinfect, not only providing comfort for the child but peace of mind that the seat is sanitary.

#### Contact

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#### Pictured

1. AIRSAFE child restraint
2. Latch mechanism
3. Thorax airbags for side impacts
4. Easy click-in fitment
5. Restraint in context
6. Quick release handles





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**Pro Rider**

For bicycle riders who look to take more out of their daily rides, Pro Rider is a multimedia enabled bicycle helmet with Bluetooth and media play capabilities making riding experience more entertaining. Unlike any other bicycle helmet or multimedia device, Pro Rider allows riders to enjoy their media outside and provides mobile phone communication.

Pro Rider allows riders to accept phone calls and listen to music while following road safety requirements. By complimenting the capabilities of a smart phone, riders can listen to messages and be notified of incoming phone calls using the Bluetooth connection to their mobile phone.

The rider will not need to use the phone while enjoying their daily rides as the controllers on the side of the helmet allows them to answer calls, communicate with their phone through voice recognition technology and listen to music.

Riders also has the option of using the built in torch to see road during night time rides and experience a safer ride due to the built in light in the back of the helmet.

Pro Rider has a built in battery and can be recharged at home or using a bike generator.

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**Pictured**

- 1. Pro Rider
- 2. User experience
- 3. Prototyping progress
- 4. Side and front form illustration
- 5. Exploded view/components
- 6. Mock-up user test



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4



5

**ProjecTunes**

ProjecTunes, is a compact, portable projector that allows musicians to project sheet music onto any music stand.

Currently musicians use tablets or notebooks as an alternative to carrying around a folder of sheet music, but this is not always ideal and cause eyestrain due to their small size and backlighting. ProjecTunes uses a different approach by offering gentler illumination and a flexible display size to reduce eyestrain and suit every performance style.

ProjecTunes uses ultra short throw technology, enabling wide projection within close range, and an extension arm allows for easy adjustment of the display size. The arm features an adjustable tension clip enabling it to be used with any available music stand.

There are two options to input PDF sheet music to the projector. The first option is to use the USB flash drive provided with the projector. The second option is via Bluetooth that can be accessed by smartphones and other compatible devices.

Musicians can also enjoy hands-free page turning by using the wirelessly connected foot pedal.

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**Pictured**

1. User context
2. Projection throw
3. Folding arm
4. Features
5. Exploded view

NETC



1



2



3



4

### ETC Fire Extinguisher

ETC fire extinguisher is an under seat vehicle-mounted multifunctional extinguisher for protection of drivers and passengers in the event of a car fire. The ETC extinguisher can quickly extinguish a fire such as in the engine bay, a wheel fire, battery fire, etc. Unlike other car fire extinguishers, ETC provides additional functions of seatbelt cutter, vessel pressure check, extinguishing arm, LED light and glass sticker.

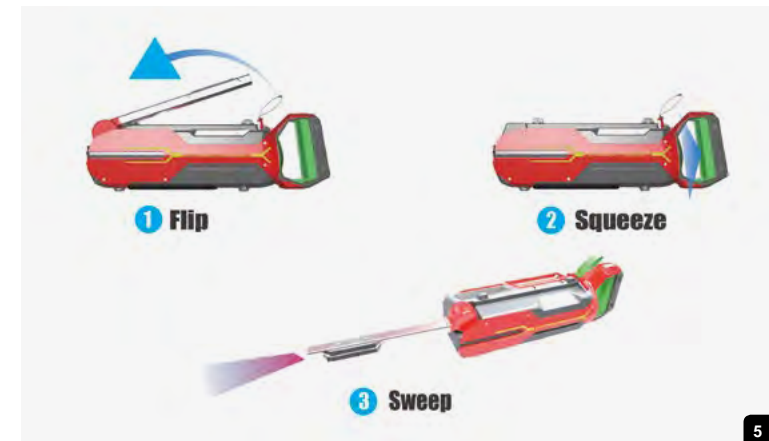
The main benefits for the consumer includes lightweight, new safety mechanism and safer extinguishing distances. ETC uses fiberglass composite pressure vessel that is 40% lighter than steel vessel of the same volume. The safety mechanism avoids the need for pull out safety pins. Only two steps are required, flip the extinguishing tube and squeeze handle. The most importantly, ETC offers a safer extinguishing distance between fire and consumer with an extended aluminum extinguishing tube, enabling more effective and efficient fire suppression.

#### Contact

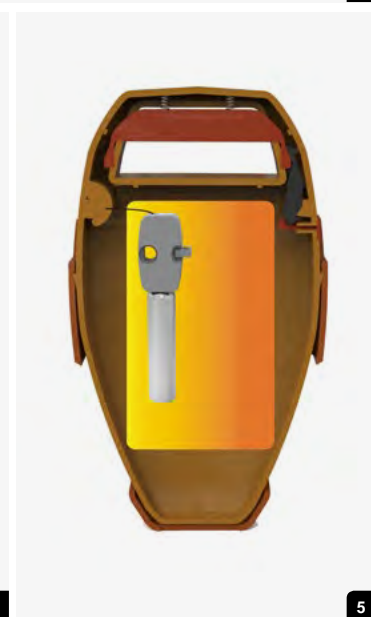
xiaojinbo1992@gmail.com  
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#### Pictured

1. ETC in use
2. LED torch
3. Seatbelt cutter
4. Side view
5. Steps to use ETC



5



## Emergency Flotation Device

A safety problem in rock fishing is that people do not like to wear a life jacket or buoyancy device while fishing. According to a fishing survey from the Royal Life Saving Society, almost 75% of respondents reported fishing off rocks, but 40% of respondents reported never wearing a life jacket/ buoyancy aid whilst fishing.

There are lots of different reasons for not wearing a life jacket. However, the most common reasons are to do with discomfort, so there is an opportunity to design a new type of emergency flotation device.

The form of this new device gives the feeling of reliability and robustness. There is a security button at the side of the device that makes sure everything is locked and safe. The device only works when users pull out the lid in unlocked mode. There is another button at the top and the device works when users push the button at the same time as they pull the lid. Then, the bladder inside will inflate in seconds and users can hold it waiting for help.

This device is useful for people who feel wearing a lifejacket is uncomfortable. It can protect users' lives when they fall into the water. The whole inflatable process time is only 2–3 seconds. This device is quick, reliable and robust that can be used in all rock fishing environment.

### Contact

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### Pictured

1. Hero shot
2. Instruction
3. Perspective view 1
4. Perspective view 2
5. Section view

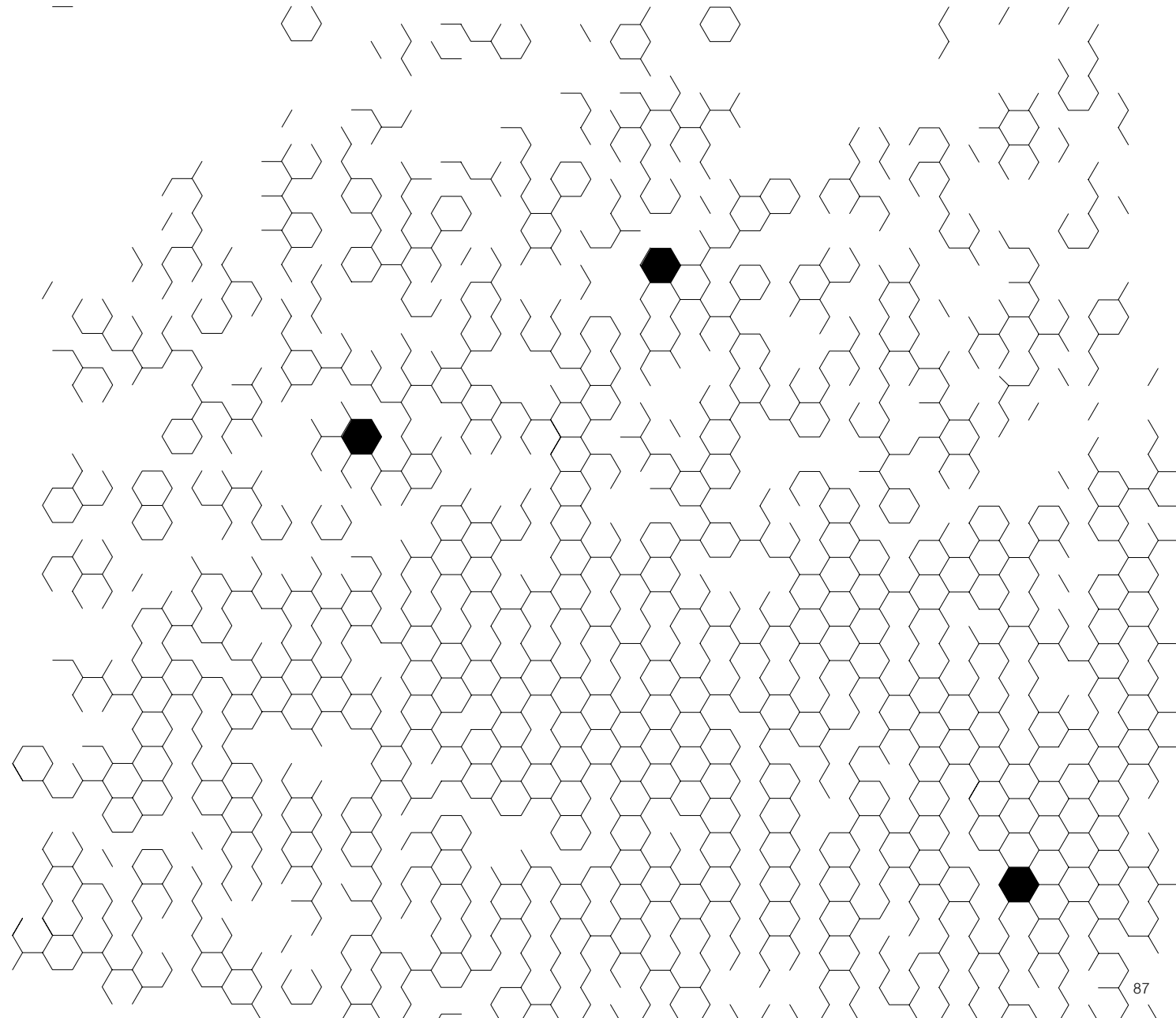


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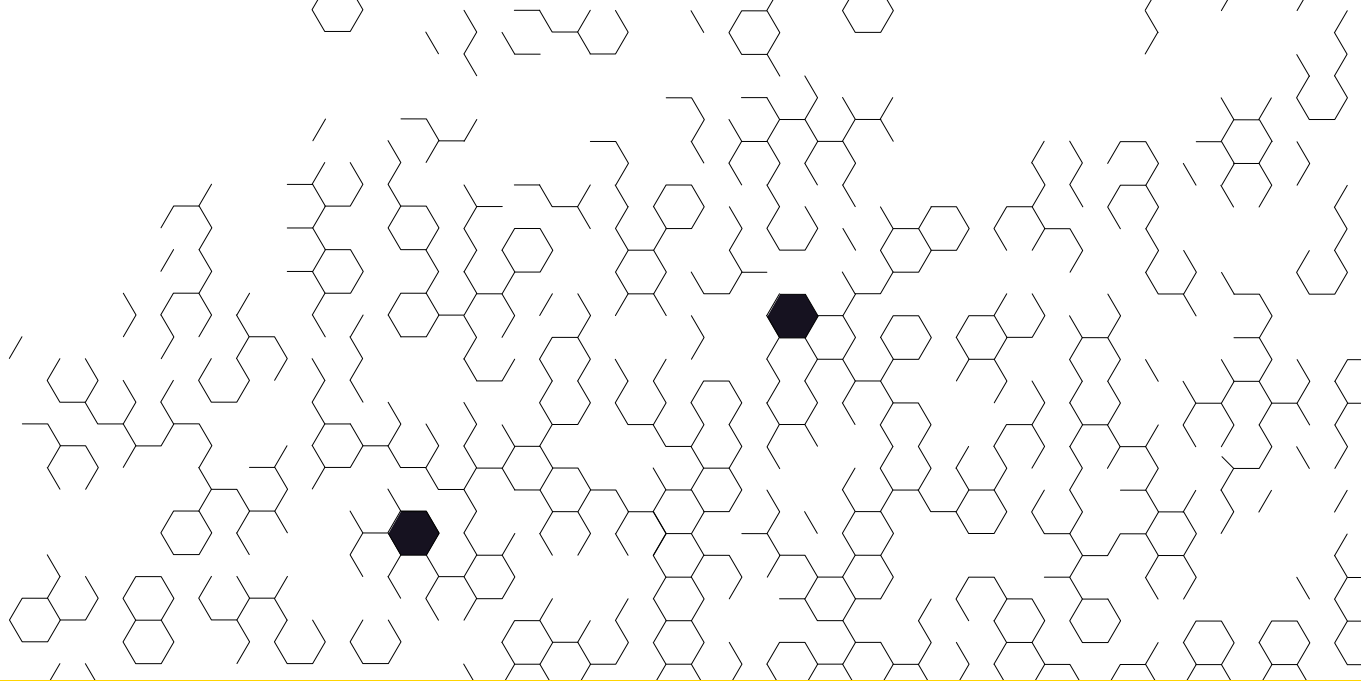
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