mistywest

Capabilities Statement

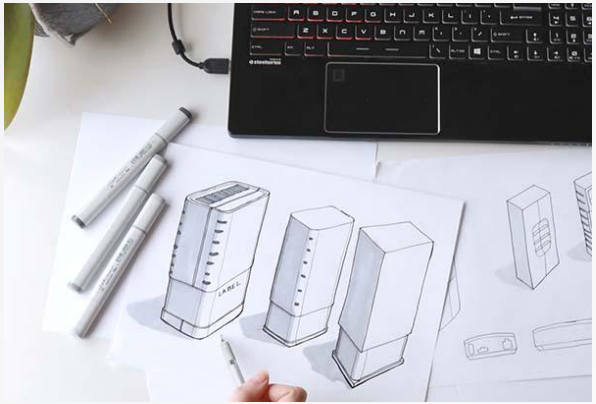
We Are MistyWest.

A product development firm who helps our clients develop market-ready solutions for **mining**, **infrastructure**, and **clean tech** in half the time compared to ramping up an equivalent internal team.

We leverage our world-class expertise in embedded systems and engineering physics to create intelligent connected sensors that advance the *UN's Sustainable Development Goals*. We take the long-view, creating durable partnerships founded on transparency and shared success.

Your Partner in Product Development.

Our bridge manufacturing services enable a seamless transition from idea to production as we help our clients **build the physical edge of the digital world**.



MistyWest values **transparency** in every step, from estimation and scoping to invoicing, ensuring honest communication and informed decision-making.

Our technical team designs **scalable prototypes** while staying on the **cutting edge of technology**, and we can start new projects within a week of a signed work order—offering faster, more agile solutions than in-house teams.

Firmware Engineering

- BLE, WiFi, Cellular (TCP/IP, AT Commands, Cat M1), Zigbee
- OS & Driver Development
- Image & Digital Signal Processing
- Application Development (Python, C/C++, C#)

Electrical Engineering

- Analog, Digital and Embedded System Design
- Mixed Signal, High Speed and RF Design
- Power Electronics Design
- PCB Design and Circuit Simulation

Mechanical Engineering

- Electro-Mechanical Hardware & Sensor Integration
- Functional Enclosure, Mechanism & Assembly Design
- Rapid Prototyping, Testing, Simulation & Analysis
- Design for Manufacturing & Assembly

Embedded Systems

- Specialized Sensing Systems
- Linux Kernel and App Development
- Real Time Operating System
- Custom Communication Stack
- Computer Vision

Industrial & UX Design

- User-Centered Design
- Qualitative Research
- UX/UI Testing & Design
- Product Visualization

Cloud IoT Engineering

- AWS IoT
- Azure IoT
- Dockerized application layer
- Data Science and Machine Learning

Specialized Research

- First-Principles Analysis & Design
- Structured Sensing for Data Science
- Optics, Interference Filters & Spectral Imaging
- Mathematical Modelling & Numerical Simulation
- Scientific and Patent Literature Analysis

Hardware Platforms

- SoMs with iMX6, iMX8, SnapDragon, TI AM series
- ADI SHARC and Blackfin DSPs
- Xilinx, Intel and Lattice FPGAs & CPLDs
- Nordic, STmicro, NXP, TI, Renesas, Microchip MCUs
- NVIDIA Volta, Google Coral ML accelerators

What are The **UN SDGs?**

MistyWest's mission is to advance the United Nations' Sustainable Development Goals by creating technically complex intelligent connected devices that accelerate the world's transition to a sustainable future.

To the right are some of the **areas of impact** that MistyWest has already contributed work to.

Clients

We build and accelerate an abundant future with ambitious partners, clients and collaborators.

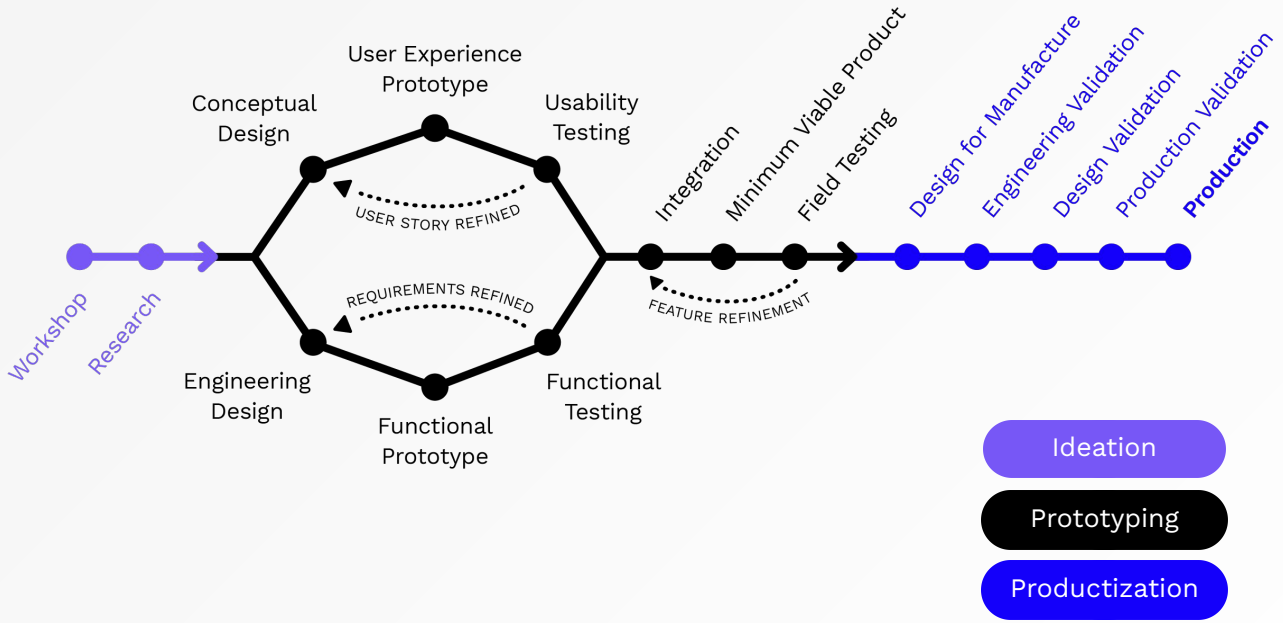
Partners

We have a long list of **vetted local and international suppliers and vendors** who work with us to deliver quality results. The following are some of the vendors we return to often:

Product Development Roadmap

We take your ideas from napkin sketch to reality in three iterative stages: **Ideation**, **Prototyping** and **Productization**.

Developing new hardware is expensive and time consuming. Using rapid learning cycles, MistyWest excels at creating MVPs quickly and cheaply to allow you to vet your business model and product market fit *before* investing in costly tooling and inventory.



Ideation

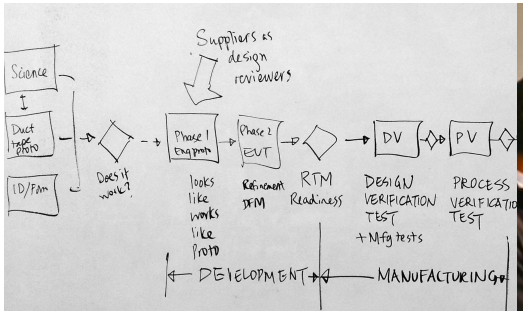
Workshop

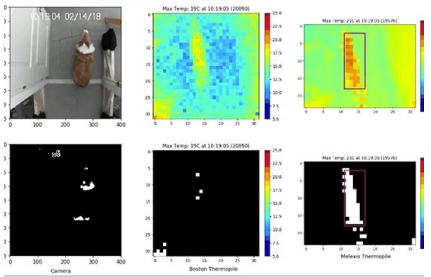
Ideation Workshops are 1-day sessions with MistyWest's senior engineers, who work with inventors and entrepreneurs to align their ideas with current trends in hardware technology.

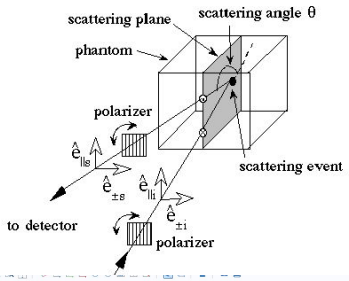
Research

Our team conducts background research of existing or similar products, technologies available to create the intended product concept, and best available options for meeting client expectations on time and on budget.

Duration	Budget	# of Units
1 DAY TO 3 WEEKS	$30K TO $100K	0



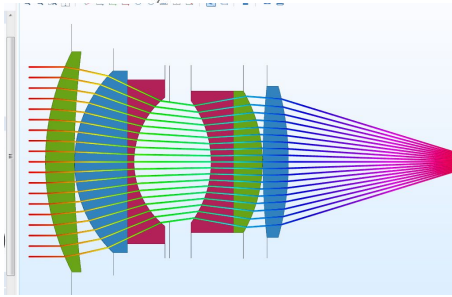




$$\sigma_e = \sigma_s + \sigma_a, Q_e = Q_s + Q_a$$

$$Q_s = \frac{2}{x^2}\sum_{L=1}^{\infty}(2L+1)(|a_L|^2 + |b_L|^2)$$

$$Q_e = \frac{2}{x^2}\sum_{L=1}^{\infty}(2L+1)Re(a_L + b_L)$$



Prototyping

Concept & Design

We generate concepts from your vision and down-select the best ideas to rapidly create physical prototypes using off-the-shelf components, 3D printing, and open source software and firmware. We develop looks-like Proof Of Concepts (POCs) and works-like POCs in parallel to ensure the prototypes are technically feasible.

Feature Refinement

Integrating the lessons and designs from the previous phase, we develop a Minimum Viable Product (MVP) that undergoes iterative alpha- and beta-testing. Our team supports any required changes to identify the client's product vision before moving onto (costly) *Productization*.

Duration	Budget	# of Units
2 TO 36 WEEKS	$50K TO $500K	1 TO 100

Productization

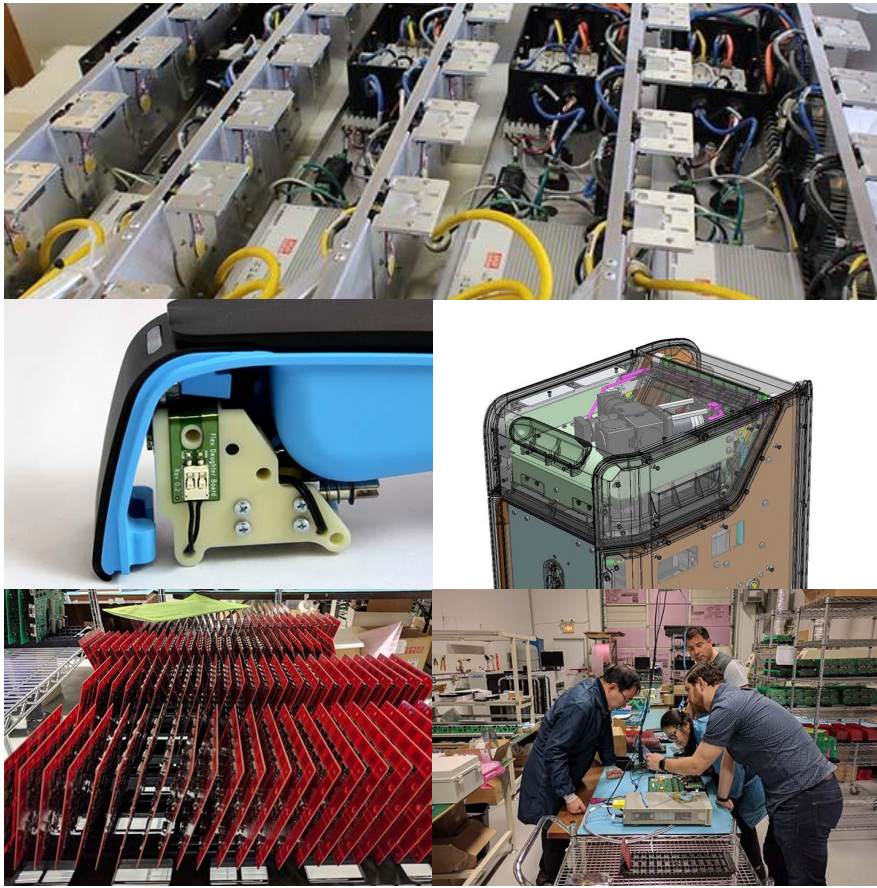
Design For Manufacture

Although manufacturability is a major consideration at the early stages of the product development cycle, Productization goes deeper into the details of how the parts will be manufactured and assembled in higher volumes.

Validation

MistyWest works closely with manufacturing companies to set up production lines, and get production-quality parts for device assembly and rigorous testing to ensure the parts meet expected functionality and cosmetic appearance requirements.

Duration	Budget	# of Units
10 TO 50 WEEKS	$100K TO $1000k	20 TO 10,000+



Case Studies

We've used our technical expertise to bring success to clients across many industry verticals.

The following slides **are only a handful of MistyWest's 200+ projects**, that detail how we addressed our clients' problems and the associated outcomes.

If you have a project not addressed by our case studies, **let us know**. We may still have the expertise to help—or have a partner who does.

Exyn Technologies

LiDAR-based 3D mapping device concept and and MVP

Ideation

Prototyping

Productization

TOP SKILLS

PRODUCT CONCEPTUALIZATION
USER RESEARCH
GENERATING INSIGHTS
COMPETITOR ANALYSIS

EXPERTISE

INDUSTRIAL DESIGN
MECHANICAL ENGINEERING
ELECTRICAL ENGINEERING

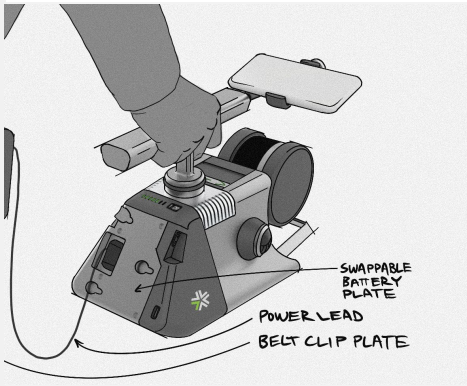
Exyn Technologies is commercializing LiDAR-based 3D mapping and autonomous navigation. They approached MistyWest for conceptual designs of a new commercial device that combined their existing handheld product *ExynPak* with their drone-mounted *ExynAero* product line.

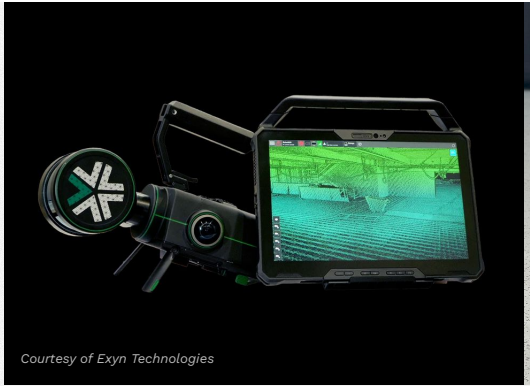
MistyWest conducted competitor and user research to identify user pain points, behaviors and unmet needs, helping identify 3 design directions which would enable Exyn's customers to rapidly transition from drone mounted to hand carried mapping. The shortlisted concept was translated into a low fidelity prototype for ergonomic experimentation, followed by fabrication of a high fidelity 'looks-like' prototype that was user tested against the existing ExynPak to inform key areas of usability refinements.

OUTCOMES

In less than one year from the start of the initial research phase, MistyWest completed the engineering work necessary to reach low volume manufacturing for the commercial release of their new product line called *Nexys*.

The resulting product will enable smooth operation at end-client facilities by combining the previous separate hand-held and drone mounted units into a single modular package.





Courtesy of Exyn Technologies

Courtesy of Exyn Technologies

Ideon Technologies

Borehole Muon Tomographer

Prototyping

Productization

TOP SKILLS

FPGA DEVELOPMENT
AWS IOT FRAMEWORK
POWER ELECTRONICS
REAL TIME OS

EXPERTISE

ELECTRICAL ENGINEERING
FIRMWARE ENGINEERING
MECHANICAL ENGINEERING
SOFTWARE ENGINEERING

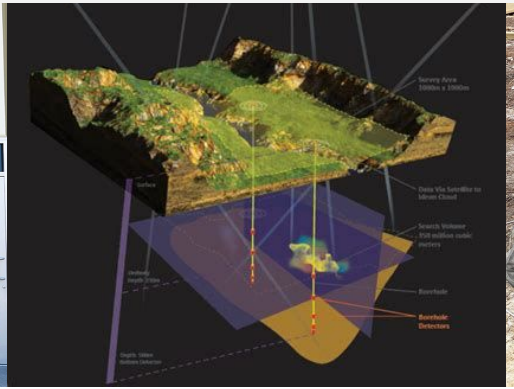
Ideon Technologies is a world pioneer in the application of cosmic-ray muon tomography, providing x-ray-like visibility up to 1 km beneath the Earth's surface. Their technology can identify and image anomalies such as mineral and metal deposits, air voids, and other structures with density properties that contrast with the surrounding earth, allowing mining companies to understand the location and value of ore bodies with much greater certainty. The results are mines that are more productive and less environmentally damaging.

Ideon's applications were limited by the size of their prototype detector. MistyWest miniaturized the electronics of a benchtop detector from 1x1x1m down to ∅ 9cm by 3m, enabling deployment in boreholes. The new electronics were designed for manufacturability, including automated test fixtures for bring-up.

OUTCOMES

We delivered 10 field-deployable prototype muon detectors in an accelerated development schedule of 12 months, reducing time to market by 1-2 years.

MistyWest has assisted Ideon with building their own internal engineering team, as well as significantly contributed to a successful $13M CAD Digital Supercluster Application. The technology developed by our team enabled Ideon's successful $16M USD Series A lead by Playground Global.



Guide Robotics

Indoor Positioning System Tracker Module

Prototyping

Guide Robotics develops SLAM-based navigation and robot autonomy technology for optimizing industrial operations. MistyWest was asked to redesign a rugged, compact, thermally managed device for mounting to forklift overhead racks, while eliminating the 10% failure rate of their existing device's power converter.

An Intel Realsense camera, NVIDIA Jetson TX2, custom LED driver and power conditioning PCBs were integrated into a customized COTS enclosure. MistyWest developed custom mounting brackets and RF-transparent antenna guards, and designed a heating system to prevent camera lens fogging when the forklifts emerge from cold storage. MistyWest built and shipped 75 custom-designed, ruggedized enclosures that accept flexible power input and are capable of withstanding variable warehousing conditions.

OUTCOMES

MistyWest enabled Guide Robotics to procure critical systems otherwise inaccessible in Japan, ensuring successful deployment of the solution.

The redesigned device supports a wider range of battery voltages, offering more flexibility across forklift platforms. By eliminating the failure rate, MistyWest enhanced Guide Robotics' ability to deliver scalable, effective solutions, boosting customer satisfaction and strengthening their market position.

TOP SKILLS

THERMAL DESIGN
DESIGN FOR RUGGED ENVIRONMENTS
POWER ELECTRONICS

EXPERTISE

MECHATRONICS ENGINEERING

World Wildlife Fund

Polar Bear Tracking Device

Ideation

Prototyping

EXPERTISE

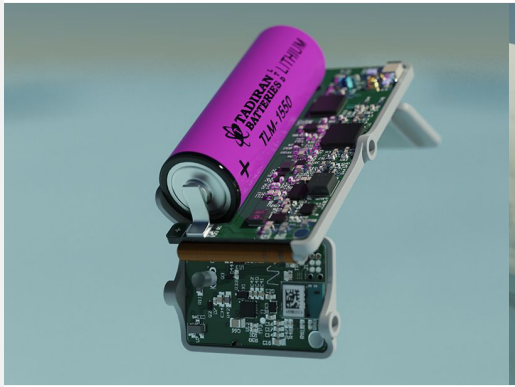
ELECTRICAL ENGINEERING
FIRMWARE ENGINEERING

As climate change progresses, the evolving migration patterns of polar bears has made it difficult to reliably track their locations. World Wildlife Fund (WWF) is working to protect and restore species and their habitats, and reached out to MistyWest to develop an ear-mounted tracking device. The requirements for this device included a small and lightweight form factor, satellite network communication, safely transmitting data to researchers, and an automatic release after an extended period of time.

MistyWest designed a waterproof enclosure with a battery that can last up to 6 months. A custom antenna with an RF front end was built, and an intelligent firmware algorithm that tracks the Argos Satellite Telemetry System pass schedules to determine optimal transmission time - making MistyWest one of the first engineering teams to produce a compact internal antenna Argos-based tracking device.

OUTCOMES

- 4 devices were sent to the Winnipeg Zoo for field trials where they were fit tested on polar bears
- US Fish and Wildlife Services is conducting further tests and revisions of the devices prior to being deployed to the Arctic
- Read more: WWF Polar Bear Tracker
- Read more: Argos Newsletter



HAVEN

Optical Particle and Environmental Sensing Platform

Ideation

Prototyping

Productization

EXPERTISE

ELECTRICAL ENGINEERING
FIRMWARE ENGINEERING
MECHANICAL DESIGN
INDUSTRIAL DESIGN

Poor indoor air quality (IAQ) can cause issues with human immune and respiratory systems, mental health, and productivity. HAVEN (formerly TZOA) is building smart systems for indoor air monitoring to improve public access to air quality information by and to provide users with real-time data, and contracted MistyWest to develop the initial prototype for an affordable and compact multi-sensor device capable of monitoring IAQ and providing a platform for data aggregation.

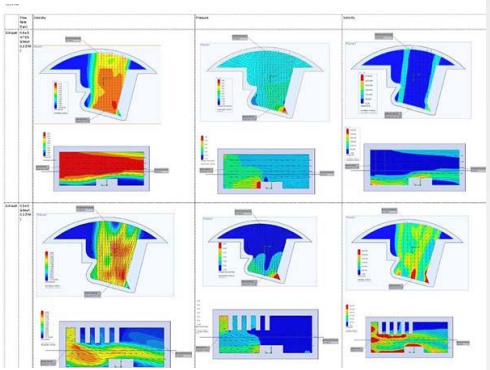
MistyWest developed multiple high accuracy prototypes for a first-of-its-kind optical particle counting technology that matched the efficacy of a $10K device in a $100 device. The designs were refined for volume manufacturing to fulfill HAVEN's successful IndieGoGo campaign, after which they contracted MistyWest to leverage their technology into a new design that integrates with HVAC systems.

OUTCOMES

HAVEN's early prototype was featured in Time Magazine's Best Inventions of 2015. MistyWest supported HAVEN as they grew their internal team to include electrical engineering staff and production support.

Thanks to its high accuracy and reliability, HAVEN has gathered support from academic and environmental research institutions, who are choosing the device over alternative particle sensor devices.

- Read more: TZOA in Altium



Amazon Fresh

IoT Connected Outdoor Signage

Prototyping

Productization

EXPERTISE

ELECTRICAL ENGINEERING
MECHANICAL DESIGN
SYSTEMS ENGINEERING

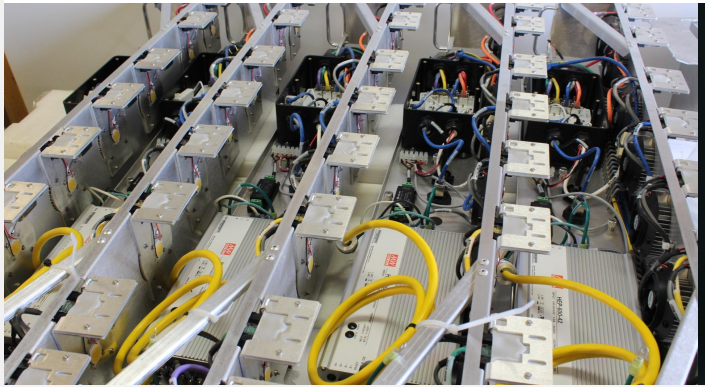
Amazon Fresh is a grocery pickup and delivery service with an online and in-store business model, designed from the ground up to offer a seamless shopping experience.

MistyWest was contracted to design custom outdoor LED signage for the flagship launch of Amazon Fresh shopping locations in the US, with requirements for units rugged enough to withstand fluctuations in outdoor temperature, weather and light conditions.

MistyWest was responsible for all engineering from prototyping to low-volume manufacturing, as well as certification for a custom cooling system that met UL, CSA, CE and FCC standards.

OUTCOMES

The project was successfully completed and shipped on schedule. Amazon Fresh was able to launch their grocery pickup services which included this connected signage at several locations in Seattle, WA in 2017.



Attabotics

99.999% Accurate Localization Sensor

Ideation

Prototyping

Attabotics is building intelligent robot platforms for warehouse fulfillment that operate in three-dimensions, with a vision of creating seamless commerce systems that save cost, time and space. MistyWest was asked to support ideation and development of a supplementary Time-of-Flight (ToF) sensor suite for Attabotics' wheeled robots. Integration with the existing robot control systems, high accuracy and reliability, and component availability for 3 years of production were all required.

MistyWest designed a single rigid-flex-rigid board to fit within the constraints of the mechanical design, and The ToF sensor suite was tested on a custom developed "robot-analog" to investigate the effect of lighting conditions, reflections and debris. Ultimately, our team achieved 99.999% accuracy feature detection using a calibrated front-end photometric sensor package.

OUTCOMES

MistyWest designed and assembled 150 photometric sensor boards and shipped a total of 128 units, which integrated neatly with the Attabotics system and required minimal redesigns.

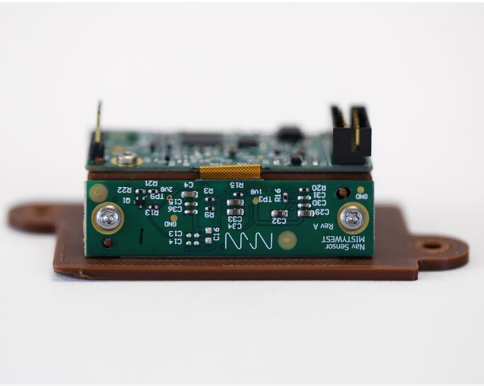
The project was completed within 9 months to meet certification and testing schedules; all amid global manufacturing and supply chain crises. The sensor suite is currently being A-B tested in real-world scenarios, with on-going support.

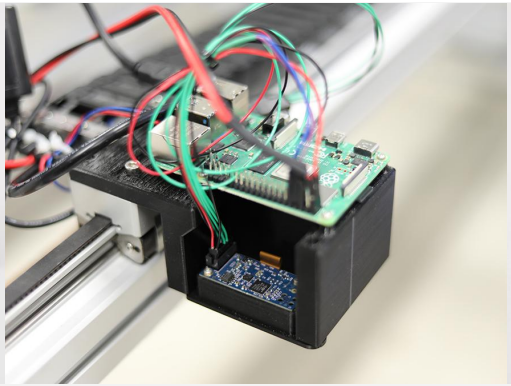
TOP SKILLS

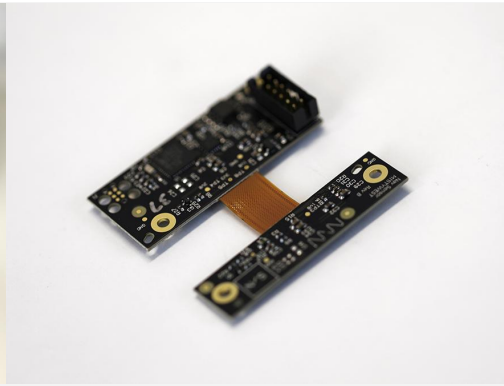
OPTICAL DESIGN
DATA SCIENCE
DIGITAL SIGNAL PROCESSING
DFM

EXPERTISE

ELECTRICAL ENGINEERING
FIRMWARE ENGINEERING
MECHANICAL ENGINEERING







Fatigue Science

Wearable Sleep Monitoring Device

Prototyping

Productization

EXPERTISE

ELECTRICAL ENGINEERING
FIRMWARE ENGINEERING
MECHANICAL DESIGN
INDUSTRIAL DESIGN
HARDWARE QUALITY ASSURANCE

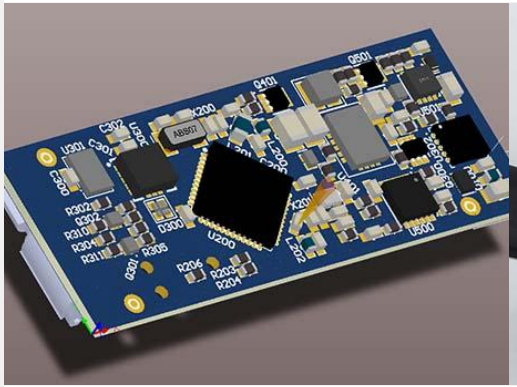
Vancouver-based company Fatigue Science is providing predictive fatigue intelligence and analytics through machine learning and continuous measurements of actigraphy to improve the safety of heavy industry shift workers and the performance of athletes.

MistyWest was approached to update the hardware and firmware for the first generation of Fatigue Science's sleep monitoring *Readi* wristband. MistyWest provided a chip-level design, custom antenna tuning and completed FCC certification, and a panelized bed of nails test fixtures was built to program the firmware onto the board, test the voltage levels and test data interfaces.

The optimized firmware extended the battery life of the Readi wristband from 7 to 45 days - exceeding the client target of 30 days.

OUTCOMES

Fatigue Science initially only required a 5000 unit production run of the updated Readi wristband, but MistyWest's successful design resulted in the manufacturing of 25,000 units without any design changes. The wristbands were used by the Chicago Cubs' and the Toronto Raptors' championship teams in 2016 and 2019, respectively, and the platform has been adopted by 20 mine sites worldwide, solidifying its position as the industry standard for managing worker fatigue.



VodaSafe

Handheld Sonar and Scanning Device

Ideation

Prototyping

VodaSafe is a BC startup dedicated to creating life-saving products that enhance public safety in aquatic activities. With core technology already proven, VodaSafe contracted MistyWest to develop a Minimum Viable Product (MVP) of a first-of-its-kind device named the AquaEye®: a handheld sweeping sonar technology intended to quickly scan underwater for drowning victims.

MistyWest was responsible for an improved form factor for ergonomic use and updating electrical components. The team executed robust user testing and functional testing of the device's sealing and interactions underwater, and redesigned a board that included a battery management system, various sensor integration, and a wireless charging solution. All elements were integrated into the final 5 fully functional and waterproof MVPs.

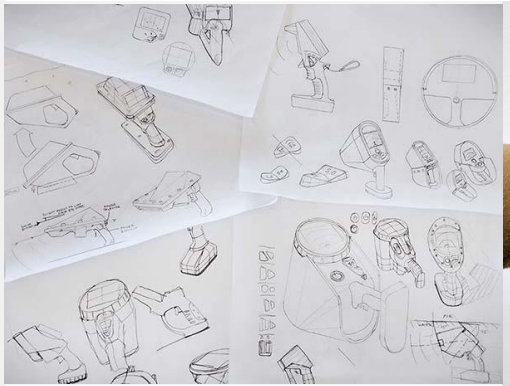
OUTCOMES

The prototypes from MistyWest were successfully demonstrated at a conference, resulting in Vodasafe securing additional pre-seed funding.

In July 2020, VodaSafe raised an additional $1.4M in seed financing to further expand the availability of AquaEye®. The device is now in use by Fire Rescue, Lifeguard, Law Enforcement and Search and Rescue teams for rescue or recovery missions.

EXPERTISE

ELECTRICAL ENGINEERING
MECHANICAL DESIGN
INDUSTRIAL DESIGN



General Fusion

Lithium Wall Diagnostic Tests & Architecture

Ideation

General Fusion is on a mission to develop a novel and commercially viable approach to fusion energy. MistyWest was contracted to conceptualize new methods for accurately measuring the shape of a rapidly-changing liquid lithium surface, and hosted an all-hands team ideation and brainstorming session with the client to understand requirements for lithium compatibility and high electromagnetic interference. MistyWest then proposed and performed feasibility research on four measurement concepts: *patterned illumination imaging, in-cavity impedance probes*, *pulsed lidar* and *ultrasound*.

MistyWest later developed a System Architecture Design to capture analog signals from General Fusion's test and diagnostics system that was robust enough to operate in a high voltage and high EMI environment, and could be scaled to accommodate future expansion plans.

OUTCOMES

MistyWest's work with General Fusion is helping strengthen partnerships with BC-based tech companies, aligning with their strategy to create clusters that accelerate innovation in fusion and related technologies.

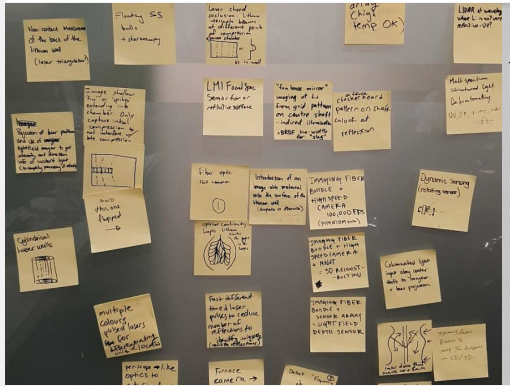
General Fusion has since received approval to build a plant near the United Kingdom Atomic Energy Authority's (UKAEA) Culham Campus.

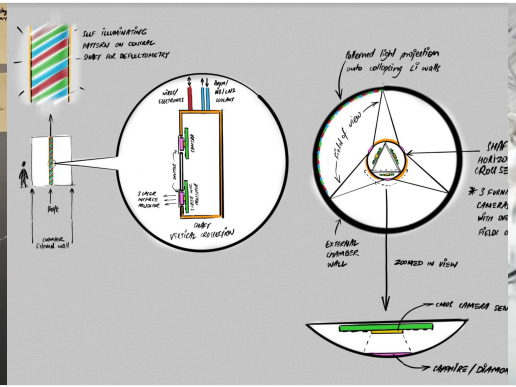
TOP SKILLS

OPTICS
CONCEPT GENERATION
BRAINSTORMING
SIGNAL PROCESSING

EXPERTISE

ENGINEERING PHYSICS
MECHANICAL ENGINEERING





Renesas & MistyWest

Low-power Computer Vision System-on-module

Ideation

Prototyping

Productization

TOP SKILLS

OPTICAL DESIGN
CONCEPT GENERATION
BRAINSTORMING
SIGNAL PROCESSING

EXPERTISE

ENGINEERING PHYSICS
MECHANICAL DESIGN

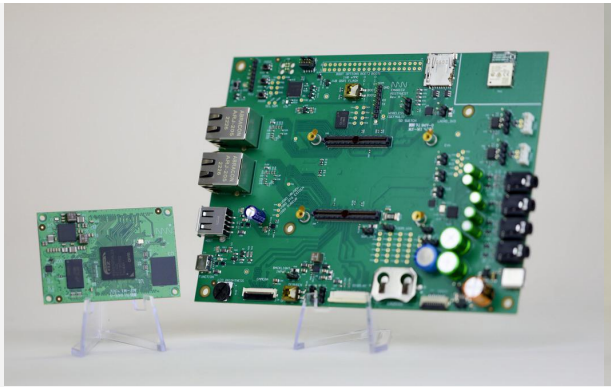
MistyWest partnered with Renesas to develop System-on-modules (SOMs) that harness the cutting-edge technology and power of Renesas' latest chips, including the AI acceleration-enabled RZ/V2L.

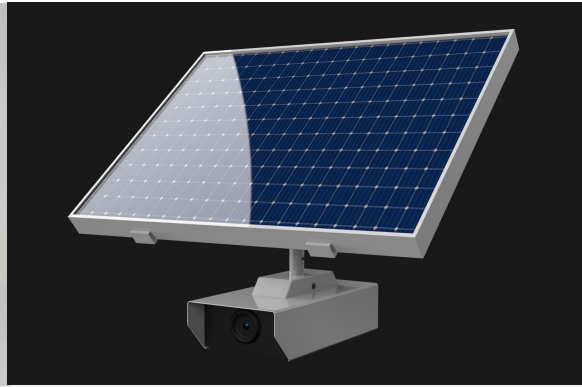
MistyWest created a 10 layer and 274 component multifunctional SOM to serve a broad range of applications, aptly named MistySOM. One version is built around the Renesas RZ/G2L MPU, with another built around the pin-compatible RZ/V2L MPU which includes an AI core. The RZ/V2L is especially well suited to power-efficient computer vision applications. MistySOM is ruggedized for industrial temperatures (rated at -40C to + 85C) and offers customization of a Linux distribution using the Yocto framework enabling flexible, scalable development.

OUTCOMES

In early 2023, MistySOM launched on GroupGets for pre-orders, reaching our initial backer goal and kicking off the first manufacturing batch. Results from these initial adopters are expected throughout the second half of 2023 and into 2024.

MistyWest is now working to optimize MistySOM for use in solar powered applications.





Confidential Client

Smart Toilet

Ideation

Prototyping

A nonprofit scientific research institute based in Menlo Park developed a smart toilet camera that collects data for a bowel-based health monitoring system of seniors' gastrointestinal and urinary health health issues, helping reduce medical interventions. MistyWest conducted initial feasibility assessment, design and manufacture of the toilet camera, with an objective to build a device and AI-based software solution that could automatically monitor and detect anomalous trends.

MistyWest provided full stack engineering services for this project. The project team designed a mechanical enclosure for wet environments, RFID for user identification, developed a web application to test and run diagnostics on the device, and interfaced optical sit detection sensors. In 8 months, MistyWest delivered a self-contained, multi-sensor toilet insert that could automatically collect visual data.

OUTCOMES

The client deployed 15 of the smart toilet cameras to senior care facilities to collect health data, which have been successfully operating for 1.5 years.

The devices are improving quality of life for residents by helping doctors rapidly understand how changes to medication and diet can lead to gastrointestinal issues. Earlier detection of these issues is also reducing the cost of medical interventions.

EXPERTISE

ELECTRICAL ENGINEERING
FIRMWARE ENGINEERING
MECHANICAL DESIGN
SOFTWARE ENGINEERING

Confidential Client

Data Collection Robot

Prototyping

EXPERTISE

ELECTRICAL ENGINEERING
FIRMWARE ENGINEERING
SOFTWARE DEVELOPMENT
RTK GPS
ROS

The exploratory R&D division of a major US tech company is developing novel solutions for more scalable and sustainable food systems. They hired MistyWest to build an early-stage prototype and control interface for an agricultural data collection robot for monitoring soil health.

MistyWest developed a high bandwidth and scalable sensor platform with an efficient image acquisition and processing pipeline capable of storing and localizing 250 high resolution images per second during an 8 hour run. Using Realtime Kinematic (RTK) GPS, the system provided positional accuracy of specific plants to within 1 cm. Drivers for all peripherals were implemented to connect to the Robot Operating System (ROS) framework.

A control interface that the device operator can only access through a web browser was designed, enabling the user to have full control over the robot.

OUTCOMES

MistyWest delivered a functioning prototype on schedule that was used in initial field trials for data collection

Following successful deployment, additional internal funding was allocated, eventually resulting in the launch of a spin-out company around the data collection robot, with a mission to use data to cultivate sustainable agriculture.

Confidential Client

Sensor Suite for Hydradermabrasion Handpiece

Ideation

Prototyping

A large, award-winning medtech company approached MistyWest to research and develop a new facial hydradermabrasion handpiece with electronic control and a suite of sensors for data gathering and ensuring a seamless customer experience.

MistyWest held ideation sessions with client stakeholders to explore and determine features important to the handpiece. A multidisciplinary team was assigned to rapidly learn, develop, and de-risk each feature, which included a miniature handheld force sensing device, a novel flow sensor that works with high viscosity fluids, miniature electronic flow control, miniature heat exchangers, and a user-friendly NFC counterfeit product ID system.

Leveraging a wide network of suppliers, MistyWest quickly delivered the prototypes to the client for user testing.

OUTCOMES

The prototype handpieces enabled fast internal user testing by estheticians that was invaluable for determining features that bring high value to the client.

The results of testing have been been added to the client's IP portfolio, and guided subsequent product development in the years that followed.

EXPERTISE

ELECTRICAL ENGINEERING
FIRMWARE ENGINEERING
MECHANICAL ENGINEERING
OPTICAL DESIGN

Light AI

Computer Vision Diagnostic Tool

Prototyping

TOP SKILLS

HARDWARE QUALITY ASSURANCE

EXPERTISE

ELECTRICAL ENGINEERING
FIRMWARE ENGINEERING
MECHANICAL DESIGN
INDUSTRIAL DESIGN

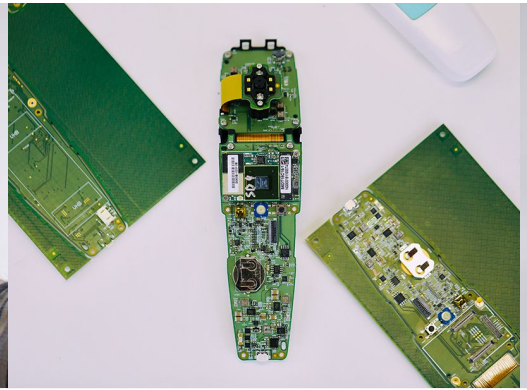
Light AI is an emerging Artificial Intelligence company with a novel solution to diagnosing streptococcal pharyngitis (strep throat) approached MistyWest with a pre-existing prototype of a handheld spectroscopic device. The device required a complete redesign, as it was deemed unsafe for clinical trials by the Internal Review Board (IRB) of key clinical partners, due to requiring direct patient contact.

MistyWest worked closely with the client's team to define the project requirements at the level required for an FDA Investigational Device Exemption (IDE) application. The redesigned device included a spectroscopic imaging system with improved accuracy, and increased irradiance of UV LEDs - eliminating the need for direct contact. A disposable injection-molded plastic barrier was also designed to protect the device from potential contamination during use.

OUTCOMES

MistyWest prepared a full documentation package for hospital IRB submission, and the updated spectroscopic device met the requirements for usability and deployment in a clinical setting, achieving a critical milestone for our client.

Light AI ran successful clinical studies at UCLA involving hundreds of patients. They later raised $5 million in funding from major venture partners, allowing them to further develop and improve the device for wider use.



MIT University

Hub Mounted Electric Bicycle Wheel

Ideation

Prototyping

MIT's SENSEable City Lab explores how digital technologies transform urban life and their broader implications. After developing a prototype for a next-generation rear bicycle wheel designed to convert pedal bikes into e-bikes, they enlisted MistyWest's engineering expertise to refine the design, making it more cost-effective and reliable for early feasibility studies and validation.

Key challenges for this product were the tight integration of electric motor, power electronics, and battery in a sealed enclosure. The engineering team's understanding of thermal physics enabled a stable battery system to be designed and adopted for the smart wheel. MistyWest was responsible for the sourcing, part creation and design for its components, requiring a lot of creativity in choosing material combinations for this first-of-its-kind device.

OUTCOMES

Co-inventor Assaf Biderman founded SuperPedestrian Inc. with an exclusive license to commercially sell the final technology of the smart wheel. It was launched as the Copenhagen Wheel in 2017 to overwhelming success, being lauded by the New York Times, Mashable, and Digital Trends.

SuperPedestrian raised over $6 million in venture funding and are considered the biggest-and-best-funded next-generation bike technology company.

EXPERTISE

ELECTRICAL ENGINEERING
FIRMWARE ENGINEERING
MECHANICAL DESIGN
SYSTEMS ENGINEERING

Cannabix Technologies

Breath Collection Unit

Ideation

Prototyping

Cannabix Technologies Inc. is developing a THC detecting breathalyzer for law enforcement. They brought on MistyWest for full-stack engineering of a functioning Breath Collection Unit (BCU) prototype to collect and store samples and interface with their breathalyzer.

MistyWest prototyped airflow geometries for accurate flow rate measurement and sensor performance validation, and developed several feels-like foam models for UX prototyping, with different mouthpiece and cartridge styles for human interface exploration. A companion Android app was developed that connects via Bluetooth to display real-time collected data measurements.

Our team delivered 2 fully functional prototypes capable of implementing breath volume, CO2 content, temperature and humidity sensing, within the short timeline as required by the client.

OUTCOMES

Cannabix saw a $17 million jump in shareholder value when the prototype completion was announced.

MistyWest's prototype played an integral role in the development of future iterations of the THC Breath Analyzer. The technology is being beta tested in various cities across North America by employers and other markets who are seeking a way to quickly, easily and non-invasively test for recent use of THC.

EXPERTISE

ELECTRICAL ENGINEERING
FIRMWARE ENGINEERING
MECHANICAL DESIGN
APPLICATION SOFTWARE DEVELOPMENT

Neurio

Energy Monitor Enclosure

Ideation

Prototyping

EXPERTISE

MECHANICAL DESIGN
INDUSTRIAL DESIGN
DESIGN FOR MANUFACTURE
ASSEMBLY

Neurio (now acquired by Generac Power Systems) is developing groundbreaking technology in the residential energy space. MistyWest designed the W1 Enclosure for a home energy monitor kit that would allow homeowners (especially those with off-grid solar systems) to monitor their home energy usage in real-time and reduce their energy costs by up to 20%.

MistyWest also created a manufacturable design for the novel SEC-2U Clip-On Current Transformer to improve electrical panel installation. This was achieved by encapsulating the 2 pieces of a split-core current transformer into a spring-loaded hinged design that could be used with only one hand, to improve safety by reducing the risk of electric shock during installation.

MistyWest's designs for Neurio all met regulatory safety requirements for installation into an electrical panel.

OUTCOMES

The results of MistyWest's work helped Neurio showcase their technology to secure additional funding from investors.

Neurio built a suite of devices that demonstrated their technology and assisted in their acquisition by Generac Power Systems. Their energy monitor technology has been integrated into new fully integrated solar and battery storage systems for homeowners.

Let’s make impact.

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