Medical Product Design

2025

Our Philosophy

Brash Inc is a full stack product development firm established in 2015. With focus on user experience, usability, emerging technologies and manufacturing, the Brash team aims to deliver products which are engaging, intuitive and truly revolutionary.

Using a combination of Industrial Design, UX/UI Design, AI Design and Software Engineering and Development, the team at Brash are able to develop ideas from their initial concepts all the way through to fulfillment and are able to step in anywhere in between.

Brash's client list is made of companies of all sizes and come from a number of industries including the medical field, consumer electronics, software and mobile applications. The wide array of expertise and a vast knowledge base allows the team to develop revolutionary products and helps to shorten lead times and reduce costs.

The Brash philosophy is to develop products which take into account the engineering and the design at every step of the product development process. This collaborative philosophy allows for solutions **which are just as beautiful and engaging as they are technically advanced.**

User Experience Design
User Interface Design
Design Research
Human Factors and Ergonomics
Trend and Competitive Landscape Analysis
Brand Strategy and Development
Concept Generation and Sketching
Colours, Materials and Finishes
Mechanical and Surfacing Engineering
Prototype and Model Making
Manufacturing Sourcing
Supply and Logistics
Part Manufacturing Analysis
Full production Assistance
Graphic Design
Field Testing
App Development

AI and Data Science
Systems Design
Machine Learning
Robotics
Mechanical Design
Electrical Design
Medical Device Design
PCB Design
Embedded Firmware
Programming Mechatronics
Vision Systems
Kinematic and Dynamic Modeling Design for Regulatory
Standards Risk Analysis
Quality Management
Advanced Control Systems
Sensor Processing
Python
C/C++
Matlab

Medical Projects

Infusing Handicare™'s product lines with new technology.

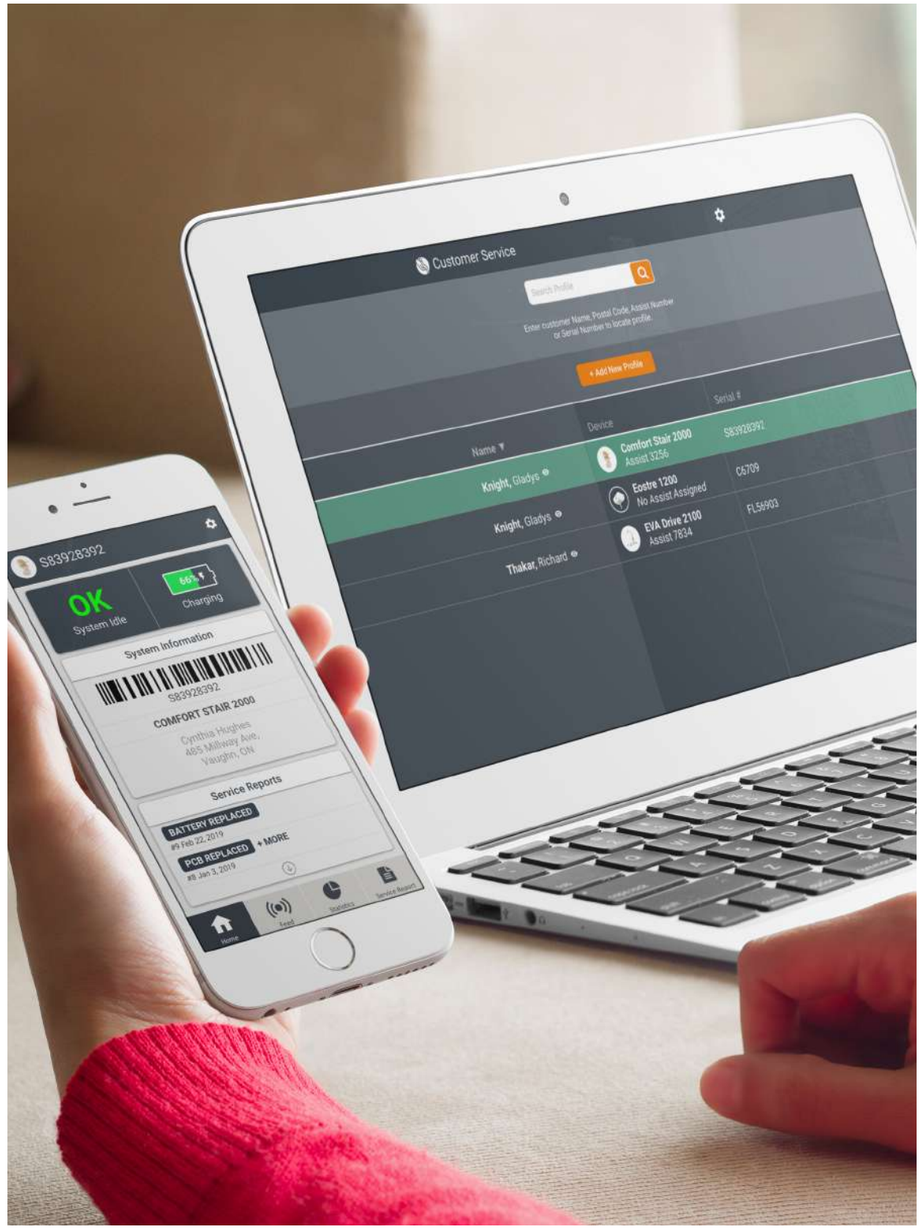
Handicare offers solutions and support to increase the independence of physically challenged or elderly people to enable them to live active lives on their own terms. They make medical devices in two areas: accessibility and patient handling. Handicare develops multiple devices in these areas including stairlifts, vehicle conversion products, wheelchair lifts, and patient transfer systems.

Brash's partnership with Handicare has spanned five years. During this time, Brash has worked to develop and innovate multiple Handicare products. As Handicare's centralized development t team, Brash has added innovation and new technology to existing and upcoming product lines. Projects have ranged from developing new haptic control interfaces for ceiling lifts, to developing web and mobile applications for caregivers, and brand unification across all product lines.

The relationship between Brash and Handicare is one of integration, with engineers and designers from both teams working together across the world to make the most successful product possible.

A more detailed case study of Brash's work is available by request.

User Experience Design
User Interface Design
Brand Strategy
Concept Generation
User Research
Testing
Manufacturing
Parts Sourcing
System Architecture
Asset Tracking IoT
PCB Design
Dashboard
Mechanical Design
Enclosure Design
Firmware
Development
Dev Ops



Handicare™ Assist Portal: Imbuing existing healthcare with smarter tech.

Handicare Assist Portal is a new application developed by Brash to help customers, dealers and manufacturers track their Handicare device usage and maintenance. Assist enables real-time monitoring of devices, identifies potential problems, and facilitates remote diagnostics.

The Assist project is part of an ongoing partnership between Brash and Handicare. In developing Handicare's 'products of the future', questions arose in how to create smarter, more innovative and technological methods of patient handling. Part of this initiative was to create a better support experience for customers, dealers, and manufacturers. Brash developed dedicated hardware that enables real-time monitoring of Handicare devices, provides alerts, and enables remote diagnostics of problems such as battery issues. This proactive approach allows for a better customer experience through preventative device maintenance.

Once again, Brash's team worked to provide a completely integrated solution to multiple design and engineering challenges. Cloud-based infrastructure was built to relay data from existing devices to an interface that interprets data and displays information to users and technicians. Advanced sensing and algorithm development built in intelligence to be proactive by measuring, identifying and predicting events. UI/UX was designed within a dashboard to best display information to clients and technicians.

Brash's work on Assist allows Handicare to explore new business models, and opportunities to generate recurring revenue. By leveraging connectivity and modern technologies, the company benefited with opportunities for new revenue. Devices could also be updated without having to replace preceding units, thereby reducing costs to customers.

Concussions and Brain Injuries with Kinarm™.

Our team at Brash had the privilege of collaborating with Kinarm, a Canadian research and robotics company. Our Industrial Design team partnered with the brains behind Kinarm to develop the enclosure design for one of their high-performance robotics, the Kinarm EP Lab. Users operate the machine through engaging tasks and games, allowing the device to gather valuable data on their cognitive performance.

The design process involved extensive ideation and meticulous requirements gathering from all stakeholders. We collaborated closely with Kinarm to weigh the long-term project considerations, including aesthetics, cost, and manufacturing feasibility. Additionally, we had to ensure the design facilitated easy assembly, kept shipping costs to a minimum, and allowed for flat packaging. Hygiene was paramount, given the device's medical application, necessitating a design that could be easily cleaned between patients, but still ergonomic and reflected a welcoming aesthetic.

Our chosen concept emphasized the use of sheet metal, aiming for a design as soft as possible with an inviting visual language through the use of continuous curves, minimal parts, light colours, and rounded corners. We then proceeded with the design for manufacturing, requiring close collaboration and clear communication between our team, Kinarm and the manufacturer. The result was a state-of-the-art device that seamlessly combines functionality, aesthetics, and the needs of the patients.

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User Research

Mechanical Design
Enclosure Design
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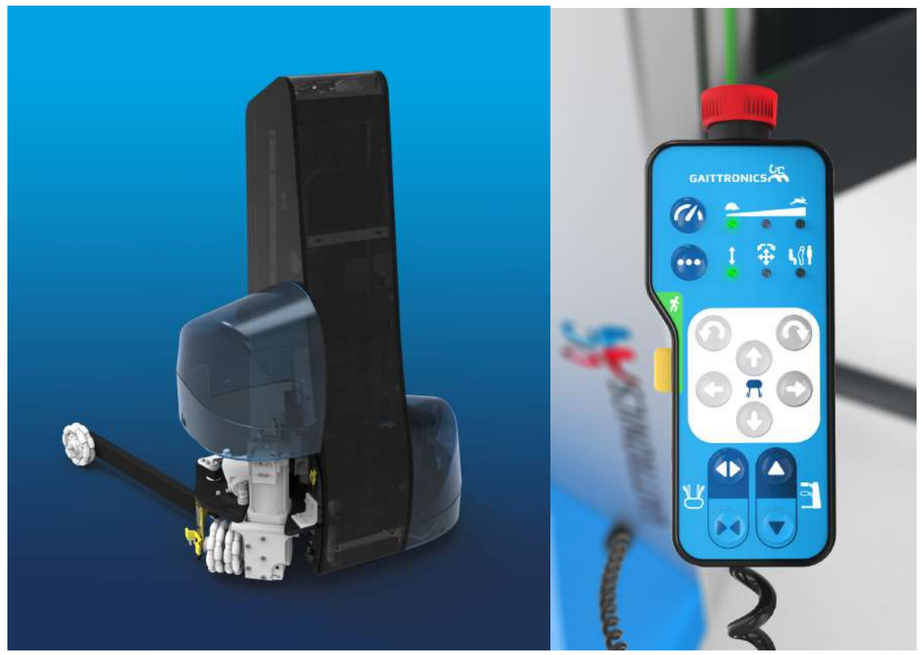
Parts Sourcing



Revolutionizing rehab with GaitTronics™.

GaitTronics Inc. is an innovative rehabilitation robotics company that develops products to enable safe and effective rehabilitation therapy for patients. Together, we designed a unique robotics powered gait trainer that empowers patients to walk and participate in physical therapy immediately after an acute illness or surgery.

Brash's involvement with SoloWalk started at the very beginning, and resulted in a complete turnkey solution. The project was a unique challenge in not only advanced human-robot interactions, but also in designing a look, shape and feel that addressed concerns about patient safety. All enclosure designs had to meet all requirements for medical devices and safety.

The advanced algorithm, novel haptics, and human-robot interactions within SoloWalk move with the user to support all their movements while they walk. The patient's safety is guaranteed by a proprietary intelligent control system that automatically prevents falls. For caregivers, SoloWalk automates the process of lifting patients out of bed, increases mobilization, prevents injuries and reduces care costs.

SoloWalk is commercially available and is one of Brash's most challenging and advanced products to date. GaitTronics continues to develop innovative rehabilitation technologies that improve patient care, minimize staff workload, and reduce patient care costs.

Research
Use Cases
Concept Generation
User Analysis Material
Research CMF CAD
Models Prototyping
UI/UX Design
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System Architecture
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Battery-powered wearables for Intrex™.

Intrex develops technological solutions for personal, health and medical related care services. Their mission is to enable individuals to age safely by developing innovative solutions to improve the measuring, monitoring, and delivery of care.

Intrex approached Brash to develop a replacement alert system and wearable device for aging individuals. There were numerous requirements to consider, as well as keeping top-of-mind aging individuals and their specific health needs. The result was a complete cloud-based monitoring system with a custom mesh network to allow for accurate location capabilities and alerts. This system works seamlessly with the device, which is easy to use, and fits into the lives of elderly individuals in care facilities.

The Brash and Intrex partnership is ongoing, and together they are developing a whole ecosystem of cohesive health monitoring solutions to improve the lives of the people who use them.

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Ensuring proper dosage with BreathSuite™.

BreatheSuite, a startup out of Newfoundland, founded with the mission to increase proper use of inhalers-- as about 94% of inhalers are used incorrectly. We teamed up with the budding entrepreneurs at BreatheSuite to create an inhaler add-on that helps patients use their inhalers correctly. The add-on specifically focuses on developing a proper breathing technique and attaches to all different types of Metered Dose Inhalers (MDI).

Partnering with BreatheSuite to create an effective medical device required a multi-pronged approach. In addition to designing the firmware, hardware and PCB to ensure proper function, improving battery life and developing advanced algorithms to enhance the machine's learning capabilities, our team also developed a device that needed to comply with medical device standards and is compact enough to carry around for everyday use.

BreatheSuite's add-on also comes with enhanced usability and personalization through a paired mobile app that allows users to measure and track real-time usage and ongoing adherence of inhalers while improving technique. The mobile platform allows users, doctors and caregivers to track usage and easily integrates with electronic medical records.

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Interface Design
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Manufacturing
Parts sourcing

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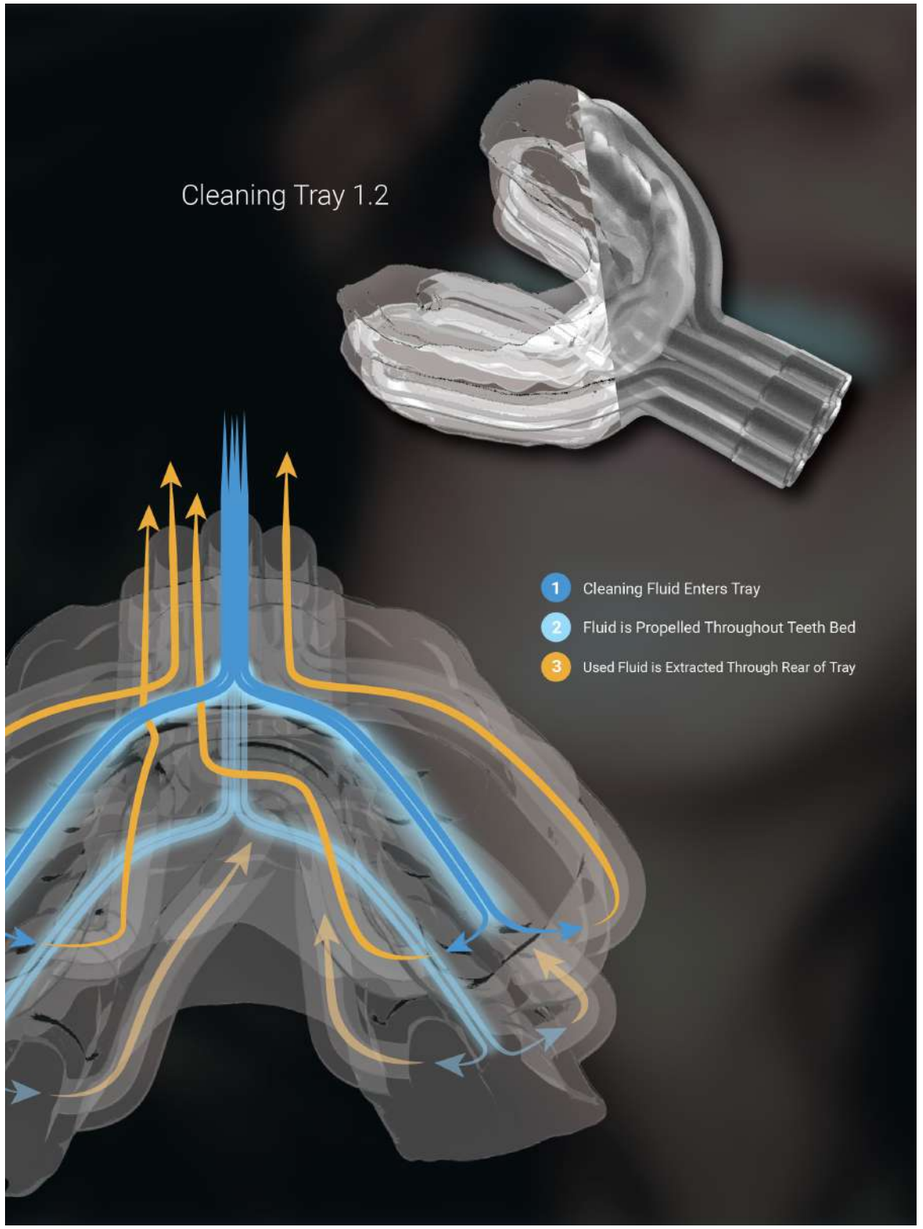


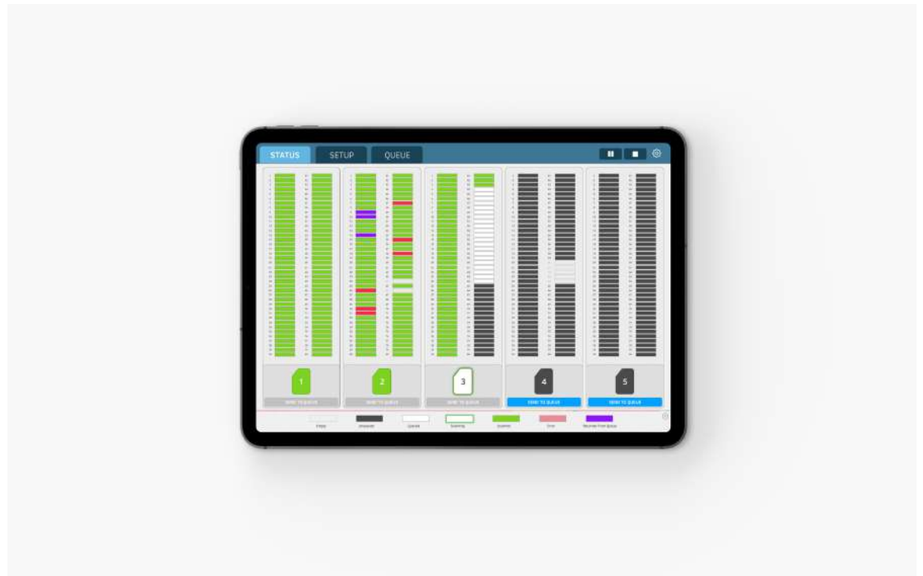
PlaqueZero™ and teeth cleaning of the future.

Plaquezero wanted Brash to create an alpha prototype of their patented Plaque Zero oral irrigation Pump Unit. The dental system is designed to clean teeth by removing dental biofilm through a custom fitting tray embedded with ports. These ports are connected to lines that run a cleaning fluid through the trays using a vacuum to irrigate the teeth. The purpose of this irrigation is to clean the teeth, dissolve dental biofilm, and treat and prevent gum disease.

Brash's team was tasked with creating a prototype of the pump unit. There were several challenges to overcome, such as building a pump that delivered adequate suction force to the tray, but also allowing building in a way to vent the waste fluid. There were also design challenges in making an aesthetically pleasing, ergonomic pump unit that was small enough to fit on a bathroom counter.

PCB Design
Component Selection
Drive Mechanism
Electronic Design to accommodate and features of operation
Material Research
Mechanical Design
Mechanical Assembly
Prototyping
Manufacturing Support

Concept Development
Casing Concepts
Sleeve Design
Materials Research
CMF
Prototyping



Optimizing digital pathology with Huron™.

Huron Digital Pathologies develops clinical imaging machines and software for large- and small-scale labs around the globe. Working with Huron, we updated their primary software used by technicians to scan and manipulate slides and samples. We reimagined their Virtual Tissuescope software to deliver a more intuitive and easy to navigate platform with a lighter and more approachable user interface.

The Brash team began the redesign be assessing who would be using the software and understand their needs. Once the needs of users were established, the development of the system architecture began with wireframing and flow diagrams. With the structure of the software in place, the face of the software began to take shape. We made and tested a number of aesthetic designs to ensure that the icons, features, and menus were all easy to understand and follow. After testing, we refined and tweaked each element in the design. Ultimately, our final, polished version of the software was deployed and is included in all of Huron's machines.

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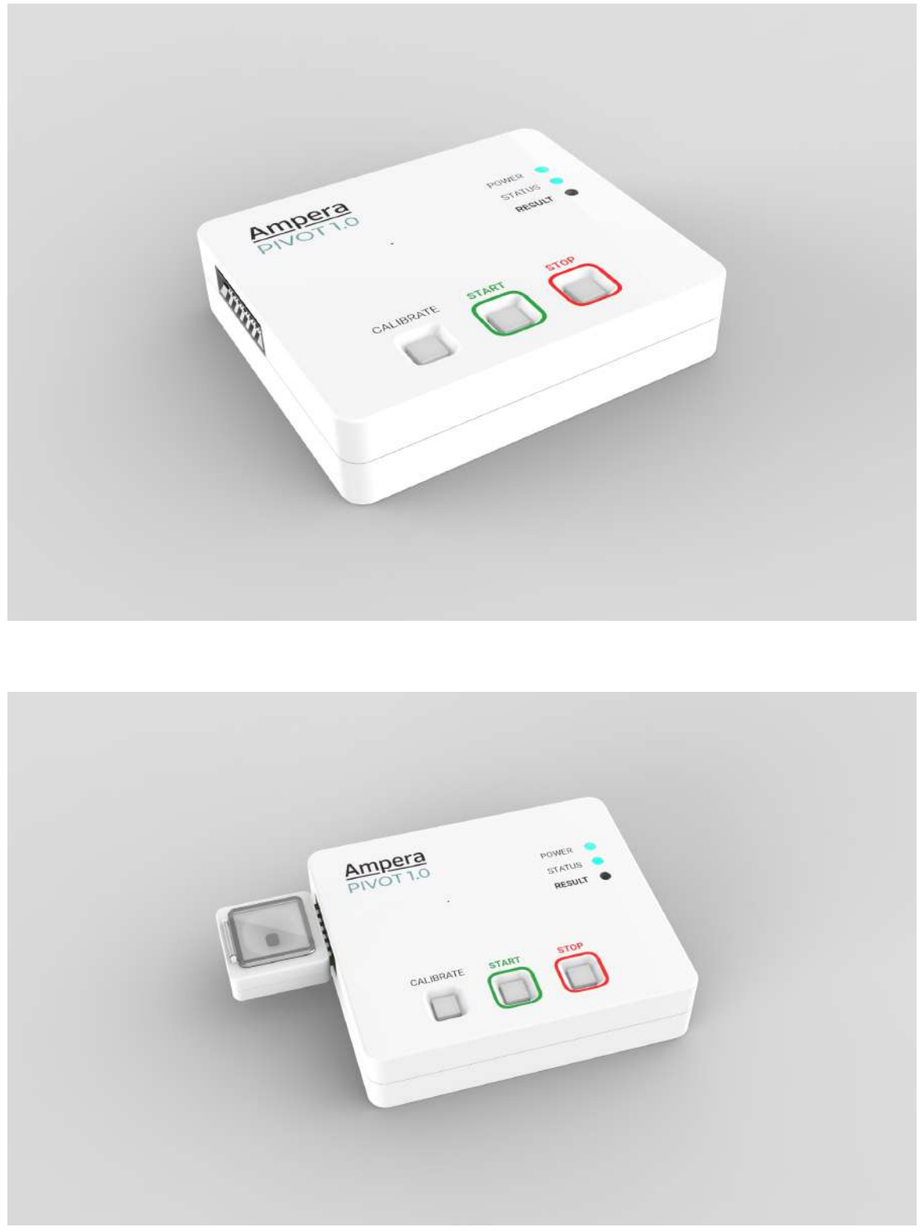

Rapid COVID Testing with Ampera™.

Ampera, a healthcare technology company, created impressive proprietary technology that facilitates testing for COVID with near instant results. Our job was to work closely with our new client to design the device enclosure and ensure the reader's functionality in an operational setting.

The reader works in tandem with a mobile/web app that allows users to scan their tests, log the date, and connect with the testing management system. This key integration with enterprise testing management will enable communication with lab systems for further analysis. Our team was responsible for incorporating wireless connectivity for that essential and seamless data transfer, including both WiFi and Bluetooth capabilities. In this project, the electronics design played a vital role, as the design relied on us skilfully handling analog circuits to amplify very small voltage signals — crucial for detecting minute volumes and achieving higher accuracy.

Another key focus in our work with Ampera was addressed design-for-manufacturing challenges within a short time-frame that still reflected a clean, minimalist design. This included finding solutions that considered assembly, scalability and manufacturing for mass production, but still created a finished product that works with Ampera's branding. This would result in a product enclosure that is white in colouring with rounded corners and a smooth, glossy finish that assured users that the product was hygienic, approachable and modern.

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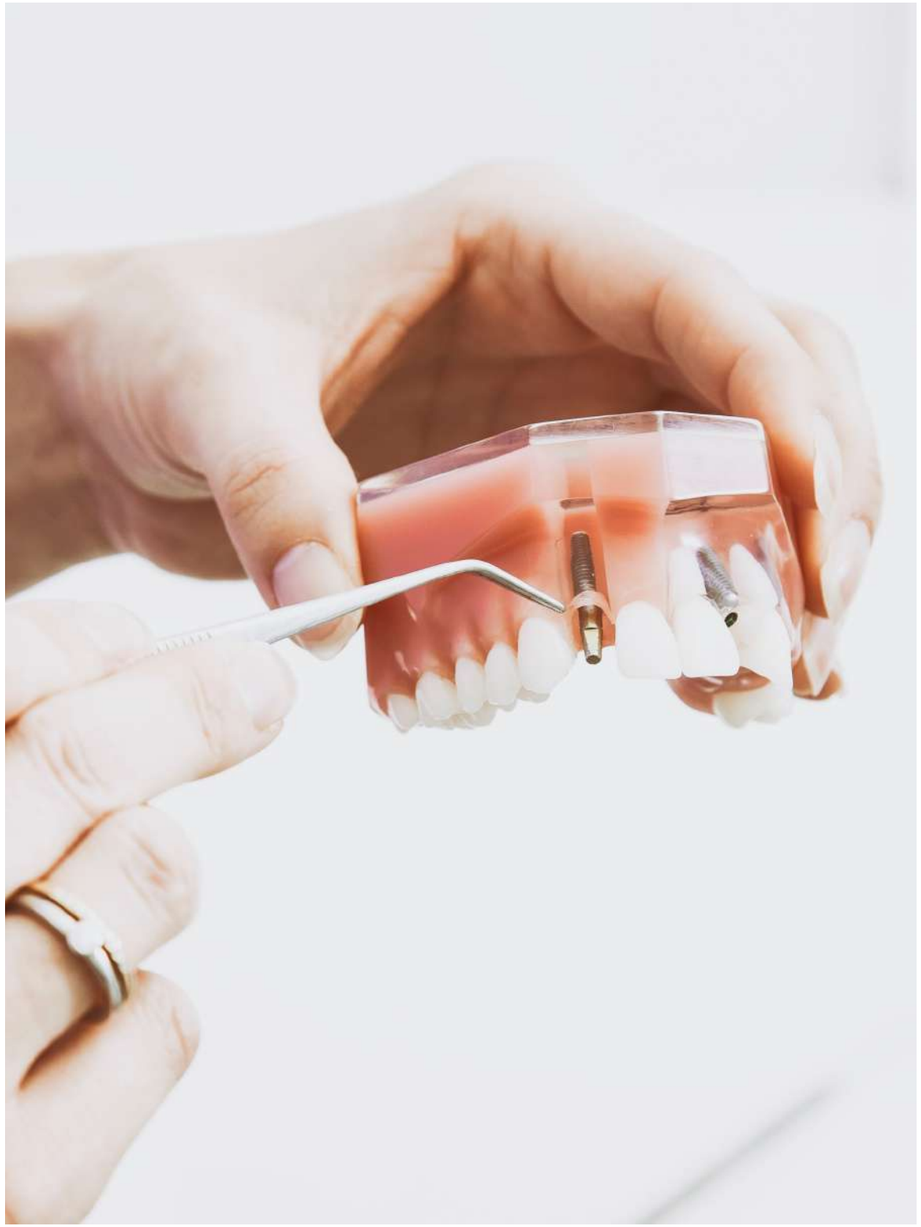

Ensuring beautiful smiles with CFT™.

Craniofacial Technologies (CFT) is a medical equipment startup that solves cranio-structural health problems such as a narrow upper palate. Often these conditions are treated in childhood using orthodontic devices, but as an adult treatments are limited to invasive surgeries and painful bone remodelling.

CFT approached Brash with the goal of developing a new solution outside of surgery and bone remodelling. We developed several medical devices for CFT, but our main project was a maxillary expander device, or MARPE (miniscrew-assisted rapid palatal expansion). CFT worked with us to create an orthodontic device that pushed forward movement and growth of the maxillary skeletal complex while maintaining a compact design.

The result was an orthodontic device with two separate pieces– an anchor and expander, that work together to apply pressure to the nine facial bones that articulate with the maxilla to slowly change its structure. This system uses a screw and palate pressure-based system. We completed extensive research and finite element analysis (FEA) to design and optimize the MARPE for stress distribution and biocompatibility. Brash developed every part of this highly specialized product. CFT's MARPE is undergoing clinical trials.

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Advanced algorithms and robotics with B-Temia™.

B-Temia develops, manufactures, and commercializes cutting-edge biorobotic technology for human augmentation systems. Their wearable Dermoskeleton™ technology provides improved mobility, autonomy, and strength to users for military and civilian applications. The Dermoskeleton™ technology incorporates an array of sensors and advanced artificial intelligence software for sensing mobility intentions and generating synchronized movements between the user and the device.

After the hardware platform was established, Brash stepped in to build upon the existing mobility sensing and motion synchronization algorithms. We developed custom algorithms that could readily be integrated into the existing hardware and software architecture. Brash's developments allowed the Dermoskeleton™ to more accurately deliver assistance to the user during critical activities such as standing, crouching, pulling, or lifting heavy loads.

Brash lives on the cutting-edge of technology, especially with advanced robotics. We partner with a number of different firms, corporations and entrepreneurs with their robotic projects, always on the forefront to new technologies and research.

Robotics
Advanced Algorithms
Embedded
Programming

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