Preface

WILDERNESS IS NOT A LUXURY.

We've all experienced exhaustion and helplessness, dragging heavy pieces of equipment, walking tens of thousands of steps, falling behind on a gorgeous track, and ending up destroying the mood and the plan; we got used to limited freedom and hitting the paved road just like everyone else did. Deep inside, we yearn to get rid of the natural limitations, walk deeper into the forest, climb higher mountains, and challenge the unprecedented speed limit.

Introducing HyperShell

ADVENTURE AWAITS. BE READY.

Meet the most advanced and capable robotic exoskeleton ever.

With aircraft aluminum body, 66lbs weight offset, up to 25km range, AI motion engine, and 1hp (800w) turbo power, HyperShell packs state-of-the-art robotics, ergonomics, and AI into an extremely compact form that provides unprecedented experiences for everyone with an active lifestyle.

Equipped with HyperShell Omega, you can walk with fewer efforts, hike longer trails, climb higher mountains, run faster, and carry more along the way. Say goodbye to sore legs and knee pains after shopping, visiting museums, theme parks, or exhibitions. From a mountainous trek to a day at the museum, HyperShell provides power and strength to those who need it, when they need it.

Design

THE HYPER POWER YOU'VE BEEN WAITING FOR.

We design HyperShell to be an entirely new generation of exoskeleton. It packs state-of-the-art robotics, ergonomics, and AI into an extremely compact form that provides uncompromising power when needed. HyperShell saves you from tired walking, physical work, long trips, and mileage limits so that you can explore more options outside your comfort zone.

Omega® System

SHAPING THE NEW SPECIES.

For the first time, super-powerful, ultra-lightweight, and elevated flexibility has become a reality in one.

The innovative Omega® system makes HyperShell lightweight and powerful. Patented and created for lower limb exoskeletons, the Omega® system brings numerous advantages that make HyperShell distinctive from others. The central motor is invented in combination with 8 passive joints, doubling the assist effectiveness and weight/power ratio of the exoskeleton.

Adventure

NO PLACE TOO FAR.

For backpackers, HyperShell can be your power bank. Recede fatigue, expand your radius and freedom, travel through jungles, deserts, and snowy mountains, and explore the untouched depths of nature.

For professionals such as photographers, HyperShell can multiply your productivity. It makes your work easier by offsetting your pack weight, helping you go further, stay longer, and take the closest shot.

For mountain climbers, HyperShell can be the sherpa in your backpack, offsetting a massive amount of weight above the snow line while reducing altitude sickness and the risk of accidents when you are exhausted.

Performance
GO WILD, FOR A WHILE.
Looking for more outside the zone? The HyperMode is specially designed for those who love to challenge their status quo. Simply hold the buttons on both sides to call for the HyperMode. HyperShell will instantly answer with an output equivalent to 1 horsepower, 50% torque increase, and quadrupled motion acceleration capability.

At the same time, the AI Motion Engine inside HyperShell will act more aggressively, boosting reaction frequency from 1000HZ to 3000HZ. This brings an added max running speed of 20km/h, a 60-degree slope sprint, a steady 30kg weight offset, and 10kg of thrust to make a history of your own.

Performance
MONSTER IN THE SHELL.
To get the monstrous performance, we created monsters of our own. The M-One motor inside HyperShell is the world's smallest high-precision PMSM capable of boasting one horsepower and 32NM of torque. This power is equivalent to lifting three cars (4,400 kg) by 1 meter within 1 minute.

Unlike the 50w motor from market walking exoskeletons, HyperShell demands stronger performance to aid you in extreme conditions. The M-One motor is specially developed for high-performance wearable robots. It is highly integrated, ultra-lightweight, high-precision, and provides astoundingly strong power.

With a low copper consumption coil and a precision speed reducer, the M-One motor outputs up to 800W, 20 times the power redundancy, and 32NM of torque, a true monster made for extreme sports.

The built-in high-precision field-oriented motor control, internal temperature and position sensors, and closed-loop monitoring with multi-dimensional force sensors guarantee M-One with pixel-level accuracy and smoothness in every move.

Sensor
A ROBOT YOU CAN WEAR.
HyperShell uses a unique sensor architecture incorporating torque, position, and environment sensors to understand your movement. This sequence delivers lower limb

kinematics and dynamics information and realistically models the human body in milliseconds.

Compute
MACHINE HEARTS, HUMAN MINDS.
The brain of HyperShell is made with not one but two powerful processors, one handling complex real-time motor control and the other acting as an external cerebellum, housing the proprietary motion engine. HyperShell can therefore model your body and maintain an acute awareness of your body movement.

Artificial Intelligence
RIGHT AS TERRAIN.
Adventures are sometimes tough. With HyperShell, you can seamlessly shift gears between different terrain conditions and paces because it understands how you move and calculates your optimal output.

The MotionEngine technology utilizes AAF algorithms based on deep learning models to foreknow your next move. Simulation technology and extensive data training generated by Human in the Loop allow the MotionEngine to handle a variety of complex terrains intelligently.

Simulation technology allows us to quickly coach and prepare HyperShell's control system for real-life complex terrains. It also protects a safe environment to test against edge cases, making it more accessible in the real world.

HyperShell will actively learn and adapt to your motion habits as you spend more time using it. Take the first step, and leave the rest to HyperShell.

Range
GOING BEYOND RANGE LIMITS.
HyperShell integrates high-polymer lithium batteries with a kinetic energy recovery system to provide an extra 16 miles range when you feel you can't go further.

Thanks to high-density ternary lithium battery technology, we are able to squeeze 100Wh into an ultra-compact volume inside HyperShell. At the same time, it has an ultra-high cycle life and maintains 80% capacity after two years of intense use.

HyperShell can get you covered even in multi-day hiking or long trips. The hot-swappable battery design on both sides of HyperShell is compatible with a mixture of new and used batteries, so you can switch batteries anytime during use.

Size
A SHERPA IN YOUR BACKPACK.
We designed HyperShell with uncompromising portability in mind. When folded, HyperShell only sits at the size of A4 paper and can be easily put in almost any backpack. With only 6.5 liters and 1.8kg in your bag, HyperShell can free you from the edges of

discomfort so you can hike farther and more comfortably, cover wider terrain and see more.

Battery
ENGINEERED FOR MORE.
The smart BMS on HyperShell supports universal USB-C PD fast charging. You can use a phone charger to charge HyperShell while traveling and get a 15% battery level in just 10 minutes, which provides a 5km functional range.

The built-in kinetic energy recovery system promptly intervenes to recover excess energy during the downhill. At the same time, providing comfortable damping and protection, which reduces the impact on your knees and toes.

HyperShell also incorporates intelligent battery monitoring technology that provides accurate power management. HyperShell simulates a slight pressing feel when the battery level is low as a silent reminder.

Lightweight
AIRY AND COMFORTABLE.
Every ounce counts. To create a lightweight, high-strength fuselage for HyperShell, we used Tesla's integrated aluminum-magnesium alloy die-casting method with hundreds of simulated design iterations. Together with Omega systems, HyperShell only weighs 1/2 of the products of the previous generation.

Less contact with the body brings more comfort. When fitted, you will feel the HyperShell almost floating on your hip. The Shell body is connected to the belt through two flexible attachment points, with elastic waistbands and leg straps to fix securely in a stealth look.

Rugged
RAIN, WIND OR SNOW.
When adventures are taken outdoors, they must withstand all weather conditions. Whether heavy rain or sandstorms – many weather conditions can damage electronic parts. Water or dirt must not enter the motor. This requires a very special configuration of the connections, the electronics, the mechanical structure, and the enclosure.

HyperShell has gone to great lengths to make weatherproof products and offers these features: waterproof screw connections, specially coated circuit boards, weatherproof aluminum enclosures, and polyurethane coatings including UV protection. This ensures optimum protection of the product at all times. The weatherproof-certified products of HyperShell comply with protection class IP54 according to IEC 529 / EN 60529.

Measure
ONE SIZE FITS ALL.
The waist width and leg length on HyperShell can be freely adjusted to fit almost anyone. You only need to refer to the size of your clothes to quickly locate the most suitable settings. Intelligent algorithms will detect whether the wearing and adjustment positions

are appropriate and adaptively adjust torque control strategies, so each of your fit is the right fit.

HyperGO
ALWAYS ON TRACK.
Take your adventurous lifestyle to higher ground with HyperGO. Its multi-parameter data insights and real-time control (speed monitoring, machine status, steps record, mileage monitoring, assistance, statistics, firmware upgrade) allow you to uncover your personal best along each adventure.

HIGHLIGHT
1. OTA: unlimited new features and tips
2. Route History: Record your breakthrough and add markers on the map with friends
3. Smart Copilot: Real-time modeling and recording of motion posture data
4. CustomShell: fully customizable and automatically generates an appropriate assist characteristic curve based on your body data
5. Data Panel: Machine status, Steps record, Mileage monitoring
6. System Compatibility: Android and iOS

ESG
NATURE BASED ECOTOURISM.
HyperShell encourages nature-based ecotourism.

Transportation is often complex in the wild. You can only rely on large-displacement off-road vehicles or riding animals for commuting, which runs counter to the purpose of ecological protection.

HyperShell allows more people to get close to nature with the most environmentally friendly commuting solution.

Encouraging nature-based ecotourism that increases visitor appreciation and understanding of natural and cultural values, which contributes to the well-being and conservation of natural areas and local communities, and increasing awareness towards the preservation of natural and cultural and local assets to among.

BRAND STORY
Curiosity and the desire to challenge it is the cornerstone of the development of human civilization.

Using technology to empower people with unprecedented abilities and enhance interaction between people and the world

Wilderness is not a luxury but a necessity of the human spirit.

DESIGN CONCEPT
HyperShell has undergone dozens of major design changes and hundreds of detailed optimizations. "Nature" has always been our core design concept. Using the perfect

combination of function, mechanics, and ergonomics as our standard, the final product has no minimal superfluous or deliberate design. It was comfortable and naturally combined with a sense of sports technology, exhibiting the most metaphorical form of the Omega architecture.

Like the design language of HERMAN MILLER, smooth lines fit the human body most comfortably. It is natively unobtrusive and blends well into the existing clothing vision system. At the same time, the CMF process of HyperShell eliminates treatment methods that are more cost-effective but pollutes the environment, such as painting. Instead, it uses the metal material's most natural color and texture. While it is environmentally friendly, it also stands for scratches outdoors.

It is always challenging to complete the design of a new product species, especially for a startup. Achieving one size fits all and being perfectly compatible with everyone's body shape is one of our biggest challenges. With the help of hundreds of users who participated in the early process, we are able to collect and test hundreds of sample body data. Based on these data, we've developed a unique one-click adjustment solution to the Omega architecture. Users can quickly adjust their HyperShell just like in the fitting room.

Outdoor environments can often be busy with lots to carry. The interaction of HyperShell should be simple and intuitive. We designed a unique one-button solution for HyperShell. Both sides of the fuselage are equipped with a button with the same function, so even in gloves, users can operate with either their left or right hands. For all weather condition indications and mileage reminders, HyperShell has 16 self-adaptive brightness indicators.

ABOUT US

HyperShell started in 2018 when the core members discovered extraordinary possibilities in simulation research on the interaction of exoskeletons and human bodies. Backed by the data and Y-Combinator China, HyperShell is on a mission to continuously promote human progress. Since its establishment in 2021, HyperShell has been innovating technologies and products in the field of the exoskeleton to reshape people's lifestyles and enable technology to empower life.

Team members have over 10 years of experience in robotics, consumer electronics, and EV. We have created over 20+ hardware products that helped over 100,000 users in 30 different countries worldwide.

TEAM

Kelvin, Founder

As a pioneer in exoskeleton simulation research, Kelvin increased the accuracy of exoskeleton simulation by 90% and invented the Omega architecture for exoskeletons. He has a Master's degree in exoskeletons research and 10 years of experience in robotics and the consumer robots industry. Products created by him have helped over 100,000 users around the world. Full stack robotics engineer, avid traveler, and adventure enthusiast. His solid experience in robotics and exoskeleton simulation ensures HyperShell's excellent architecture design and impressive booster effect.

Song, Chief Experience Officer

As a product manager in a leading EV giant, Song's most recent masterwork is the world's fastest luxury electric MPV. He has over 10 years of experience in consumer electronics. His ability to oversee the user experience details has guaranteed HyperShell's ultimate requirements are met even with the most demanding users.

Angelo, Chief Technology Officer
As an expert in robotics and AI, Angelo worked as the leader of XX's AI algorithm department. He developed parallel robotic arm products and AI image recognition technology such as Eagleeyes and Haskylens from 0-1. His cross-understanding of traditional robot control algorithms and artificial intelligence is the foundation for the smooth development of HyperShell's AI Motion Engine.

Frank, Chief Structural Specialist
Previously as the AR/VR glass structural leader in a leading metaverse company, Frank has designed over 100 consumer electronics and smart wearable products, impressing tens of millions of users. He brought precision design experience and standards such as mobile phones/VR headsets into the field of exoskeletons, ensuring HyperShell's leadership in ergonomics and manufacturing process and squeezing all components within an ultra-compact size with IP54 waterproof and dustproof capability.