Taiwan Tech Arena (TTA) is a flagship startup ecosystem building program launched by the Ministry of Science and Technology. Through integration of various resources, TTA strives to promote Taiwan into a vibrant international startup ecosystem by supporting startups through our networks of partner accelerators, mentors, investors, and corporate members while expanding their global reach to create more business opportunities.

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TAiWAN TECH ARENA

TTA

The Development Trend of AI in Sports Technology

AI empowers the sports industry to establish a service workflow centered on data analytics and forecasts.

Thriving TTA Black Card Community

Now with 35 members, TTA continues to work closely with Black Card members to connect even more global resources.

TAiWAN TECH ARENA

JAN. 2022

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TTA SOUTH UNVEILED: BRIDGING NORTH AND SOUTH

TTA Launched its 2nd Location in Shalun, Tainan with the Goal to Bridge Resources between Northern and Southern Taiwan and the World.

TTA KICKS OFF 2022 WITH 100 STARTUPS AT CES AND THE UNVEILING OF TTA SOUTH

2022 is going to be one of the most exciting years for TTA! As the world adapts to its coexistence with COVID-19, TTA continues to pave the way for startups, local and international, to connect with the global market. This month, TTA led 100 startups to take part in CES 2022 in Las Vegas, USA, on January 5-8. And we are pleased to announce that our startups have been awarded with 7 CES Innovation Awards, bringing the total number of awards we've received since 2018 to 30. This is truly a remarkable accomplishment for us all.

Last month on December 24, TTA achieved a very important milestone with the official opening of our second location in Tainan, so called TTA South, which is located on the 6th floor of the Cybersecurity & Smart Technology R&D Building in the Shalun Smart Green Energy Science City. TTA South aims to support startups in Smart Tech, Precision Medicine as well as Clean & Circular Tech and offers Taiwan's most comprehensive tech verification and demonstration sites. Our goal is to connect startups with the local industries and to bridge resources between northern and southern Taiwan to boost the growth of startup ecosystems in the Greater South.

Also, we are thrilled to introduce two more of our Black Card members – Jerry Chen and Christopher Teng Balmaseda, two VCs who have started engaging with startup ecosystems in Southern Taiwan. Discover their incredible journeys and the exciting reasons that have led them to Southern Taiwan. What's more, the startups we proudly present in this issue are startups in the limelight on global stage for their outstanding performance at world-renowned Hello Tomorrow deep tech competitions in addition to startups that have successfully raised funds from high profile international investors.

TTA believes technology and innovation are the keys that will help the world develop towards a better future and industries grow sustainably. TTA is committed to our mission in serving as the platform that connects technology, talent, market, and capital to drive entrepreneurship forward and empower global tech startups to realize their moonshot ideas. Join us in our mission and let's make Taiwan startup ecosystem the place to be onwards!

On behalf of TTA, I'd like to wish everyone a prosperous new year. May 2022 bless you, your family and loved ones with health, wealth, and happiness.

Andrea Hsu

Director General, Department of Academia-Industry Collaboration and Science Park Affairs

Andrea Hsu

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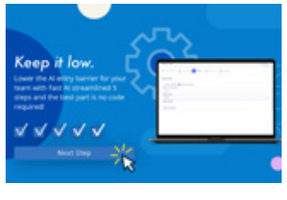

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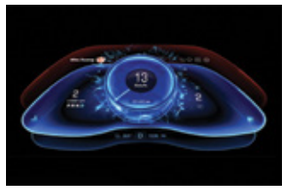

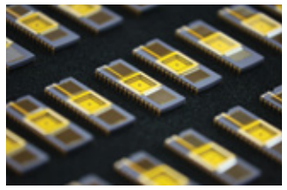

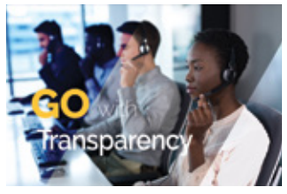

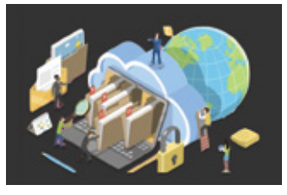

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TAIWAN TECH ARENA EVENT SUMMARY

Online, in person, and hybrid - TTA organizes events on a regular basis to provide startups with the opportunity to present themselves and build the networks they need to thrive.

TTA SOUTH

Located on the 6th floor of the Cybersecurity & Smart Technology R&D Building in the Shalun Smart Green Energy Science City, TTA South aims to bridge resources between northern and southern Taiwan to boost and accelerate the growth of startup ecosystems in the Greater South.

TTA South

Diverse Demonstration Sites to Satisfy the Verification Needs of Startups

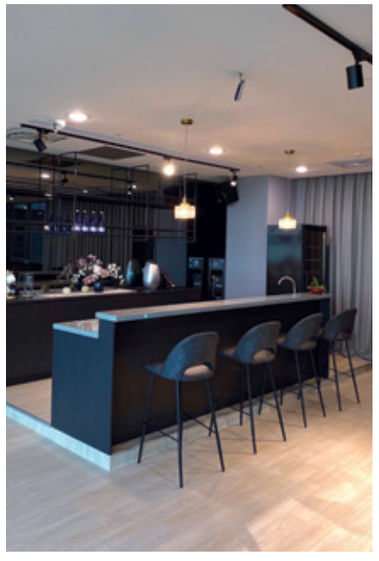
In response to the government's promotion of six core strategic industries and the Great South, Great Development policy, the expansion and growth of Southern Taiwan's startup ecosystem has been accelerated by the introduction of world-class startups looking to develop Southern Taiwan's emerging industries and transform traditional industries. Since current large-scale science and software parks are mostly concentrated in Northern Taiwan, the clustering of resources in the north has caused a development gap between the north and south. The Executive Yuan has gathered 13 ministries, including the Ministry of Science and Technology, Ministry of Economic Affairs, and National Development Council, to build the Shalun Smart Green Energy Science City. The program is focused on providing a venue to perform testing and verification of R&D in green energy technologies and is expected to create green energy industry chain clusters.

Along with the launch of Shalun Smart Green Energy Science City, TTA announced the establishment of TTA South on the 6th floor of the Cyber Security & Smart Technology R&D Building in Zone C. The vision of TTA South is to connect universities and research institutes in Southern Taiwan to strengthen the overall development of the tech startup ecosystem. Full assistance will be provided to startups including connections with international capital and markets, thereby creating a more comprehensive ecosystem in both the north and south.

TTA South focuses on three major industries: smart technology, precision medicine, and clean & circular tech; and three major principles: co-creation, demonstration, and globalization, which will serve as the foundation to attract top-notch startups into the hub. In addition, TTA is currently creating a list of key features and resources in the south such as industry clusters, associations, and enterprises. Matchmaking for startups, forging alliances between big and small companies, and utilization of the many demonstration sites in Shalun Smart Green Energy Science City will support startup landings, help incubate world-class startups, and give a voice to Southern Taiwan's tech ecosystem.

Since its founding, TTA has operated at an exceptional pace, accelerating over 500 startups and helping to raise more than NT$10 billion in funding. In terms of exposure, TTA has supported hundreds of local and international startups to attend major events in the US, Europe, and Asia. Furthermore, TTA has attracted over 200 international startups to land in Taiwan through its accelerator partners who have built up a network of 38 startup support organizations worldwide to provide additional assistance to Taiwan startups in terms of global expansion.

TTA South boasts a total space of 4,291 m^2 with 2,208 m^2 of operation space. The space has been designed based on 4 key attributes: surroundings (promoting co-creation between startups and corporations), resonance (boosting innovation resonance), gravitation (providing demonstration sites to draw startups), and continuation (continuing and maintaining TTA's brand image). The site includes exhibition space, conference rooms, office lounges, recreation room and VIP lounges. Startups can apply to rent one of the 24 private offices of various sizes, 8 office booths for individuals, or the 51 co-working space seats. Additionally, TTA South has integrated private 5G networks, information security facilities, smart access, cloud services, and more into the site, so that resident startups and corporate members can enjoy services at both TTA in Taipei and TTA South through a single device.



Currently, TTA is supporting startups primarily through accelerators with programs ranging from four to six months. TTA South will also provide longer residency periods considering the number of universities and research institutes in the south which include the Industrial Technology Research Institute, National Applied Research Laboratories, National Chung-Shan Institute of Science and Technology, National Cheng Kung University, and National Yang Ming Chiao Tung University. Startups are limited to a two-year stay with eligibility to apply for a one-year extension; enterprises are limited to a three-year stay with eligibility to apply for a three-year extension. TTA South will become Taiwan's only diverse and forward-looking demonstration site. Aside from private 5G networks that can be utilized in innovative experiments for unmanned vehicles and Fintech, Shalun Smart Green Energy Science City also has a site for self-driving vehicles to test Internet of Vehicles (IoV) applications, a green energy tech demonstration site to verify smart green lifestyles, a long-term care facility for the verification of healthcare technology, Taisugar Circular Village to verify business models for co-sharing services, and the Mitsui Outlet Park, which provides technology verification services. All in all, the science city can be regarded as Taiwan's current most comprehensive demonstration site. It is the optimal venue for startup to develop and grow into successful businesses.

AIPLUX™

Smart IP Platform: One-stop Solution for Global IP Protection

The pandemic has brought about many changes on a global scale. Most interactions have become virtual bound, and business transactions are no exception. This trend has accentuated the importance of globalized intellectual property (IP) rights protection. AIPLUX™ is the first smart IP service platform in Taiwan that makes applying for IP rights across linguistic and national borders easier than ever. Compared to traditional consultation fees, the new solution vastly reduces costs so that even individual creators can protect their IPs internationally. Going forward, the company aims to become the preferred tool for IP applications not just in Taiwan, but in the broader Chinese-speaking market.

Legal services for intellectual properties have a high entry barrier that is even less accessible in cross-border scenarios due to linguistic, legal, and procedural complications. Even for established enterprises, it is difficult to apply for IP protection to secure their rights in a foreign market. In Taiwan, complicated legal and administrative procedures have made applying for trademark or patent protection a convoluted mess that is usually left to IP or legal firms to deal with.

The challenge is even greater for Taiwanese enterprises looking to apply for IP protection in foreign markets due to Taiwan's exclusion from the World Intellectual Property Organization (WIPO). This results in applications needing to be submitted through the U.S. or China, greatly increasing costs and time. For those who are willing to undertake this mammoth task, they are still met with the fact that Taiwanese IP firms usually do not offer such international services, leaving enterprises to fend for themselves.

All of these difficulties have greatly obstructed the ability of Taiwanese enterprises to expand globally. Compared to neighboring Asian nations (Hong Kong, Korea, or Singapore i.e., the Four Asian Tigers), Taiwanese enterprises have the lowest rates of foreign IP applications.

LOFA: Bringing Down Barriers to the Democratization of IP Applications

To overcome these IP pain points faced by individuals and enterprises, AIPLUX™ introduced the AI-powered LOFA international trademark application platform. AIPLUX™ founder Alfred Wu said that the LOFA platform can help all types of entities, small- to medium-sized enterprises, startups, personal brand studios, young innovators, and even night market stalls. They simply need to go to the platform, select the country they would like to register the trademark, specify the category and quantity, and the system will automatically provide an estimate of the total cost and guide them to complete the application process on the platform. Compared to applying for trademarks through traditional IP firms, which can take up to one week for documents and forms to be filled out and sent, the LOFA multinational trademark application platform takes only 5 minutes to complete the process.

Furthermore, AIPLUX™ has released auxiliary platforms for LOFA that are now entering the test stage. One is a matchmaker platform that can help connect inventors and enterprises with professional patent drafters and submit international patent applications. The other is an intellectual property management platform that lets users monitor all of their patents, trademarks, and copyrights using one single unified interface with lower costs and higher efficiency.

Connecting Taiwan to the Rest of the World

AIPLUX™ maintains a dual-track approach by making sure its expansion to the international market takes place alongside its efforts to increase IP protection in Taiwan. Alfred said that because legal and accounting resources in Taiwan are heavily centered in the north Taiwan, enterprises in the central or southern regions may have a hard time accessing them. While the online platform can circumvent geographical limitations and support applicants to apply remotely, certain functions and services still need to be provided in person. To fulfill this unmet needs, AIPLUX™ has applied for a space at TTA South and established an office near Kaohsiung City's Central Park. In the future, the company will organize events and activities to connect with southern enterprises, helping them utilize IP protection to increase their competitiveness.

For the international market, the company plans to provide, among others, multi-language service on the LOFA platform to make it more easily accessible for international users. Their service is especially well-suited for enterprises looking to conduct business in Taiwan, Japan, Singapore, China, Hong Kong, and Macau, serving as a single platform that manages international trademarks at lower costs and reduced complexity. According to WIPO estimates, these countries account for 60% of the global trademark application market. This new service perfectly fills the void in the market to help strengthen IP protection globally.

AIPLUX™ has acquired close to NT$20 million through Headline Asia in its seed round funding and plans to focus on Japan and the U.S. as its first foreign markets. In November 2021, AIPLUX™ was awarded the HLF No.1 Award in France. Alfred said that the French and Spanish markets will be major focuses as well for the company in the future and that they seek to globalize their services beyond the Chinese-speaking market as they continue to promote upgrades to the IP ecosystem.

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FlowVIEW Tek

Groundbreaking Proprietary Liquid Sample Inspection Technology Meets Cross-industry Application Demands

Since the invention of semiconductors half a century ago, they have become an integral part of our lives. Be it smartphones or automobiles, everything runs on semiconductor chips. As semiconductor architecture becomes more advanced, companies are investing heavily on research to improve their yields. Throughout it all, ensuring the quality of the slurries used for silicon wafer polishing is a major challenge for manufacturers. To solve this issue, FlowVIEW Tek has introduced its FlowVIEW AOI total liquid sample solution, which aims to accelerate the industrial transition towards higher-end architectures.

The optical microscope, which has existed for more than a century, has three major problems in the context of nanotechnology that remain difficult to solve today. First, samples smaller than 200 nm can not be observed under optical microscopes. Second, optical microscopes are affected by interference caused by nanobubbles, resulting in degradation of the optical signal and inaccurate measurements. Third, optical microscopy readings of small particles lack precision, which makes them unfit for the latest cutting-edge architectures. As a result, the semiconductor, energy, battery, biomedical, and cosmetic industries are all gradually switching to electron microscopes. However, electron microscopes have their own limitations when dealing with liquid samples. As samples need to be vacuum suspended, this means they cannot be observed in their original state, and they need to be dried. Both of these restrictions have driven companies to search for better solutions.

FlowVIEW General Manager Kyle Lee said that the vacuum environment that electron microscopes samples are placed in will cause the liquid samples to dry out and produce distorted images. Therefore, liquid samples have to go through a series of complex pre-processing steps including drying, freezing, and slicing just to barely keep the sample structure from collapsing. Even after taking all these measures, it is still impossible to directly observe the actual appearance of liquid samples. To overcome this pain point, FlowVIEW combines its three core technologies—In-situ Liquid Microscopy, Liquid Automation, and AI Image Processing—to form the Flow AOI total liquid sample solution. This solution uses an exclusive microfluidic chip system to create an atmospheric environment in the vacuum chamber of an electron microscope that preserves the original appearance of the liquid samples. It also integrates high-end AI image analysis software to provide raw, nano-level image results with the highest resolution available in the industry (resolution at 160,000x magnification).

Exclusive Patented Technology Raises the Bar for Global Nanoscale Inspection Instruments

FlowVIEW, a spin-off of the Center for Measurement Standards under the Industrial Technology Research Institute, was founded in 2017. The company aims to use exclusive patented technology to overcome traditional liquid material inspection restrictions to meet the demands for nanoscale liquid inspections in various fields. Since its inception, the company has received many awards such as the Computex d&i Award and the Audi Innovation Award. It was also a finalist for the Skydeck Berkeley program in 2019. The company has received industry recognition because its solution allows for an accurate observation of liquid materials in their original state. Combined with other exclusive technologies, the solution is able to provide a fully automated smart analysis service for nanoscale liquid materials that meets the needs of many industrial applications.

According to Kyle, FlowVIEW's Flow AOI total liquid sample solution is made up of the Aquarius Starter Kit, AI Particle Imager, and In-line Multi-Channel Liquid Particle Inspection System. The most notable selling point of the Aquarius Starter Kit is that it allows liquid samples to skip conventional pre-processing since it can prepare liquid samples for electron microscopes in just 30 seconds; in addition, it is compatible with samples as small as 7 nm, making it ideal for the semiconductor, energy, battery, biomedical, and cosmetic industries.

As for the AI Particle Imager, it is currently the only AI image optical microfluidic total solution in Taiwan. The Imager overhauls traditional reliance on interpretation through indirect measurements to directly give readouts of accurate first-hand data. It is capable of identifying translucent particles, bubbles with irregular contours, microbial species, among others, and thus can be used in applications such as LCD panel factory etching solution analysis, translucent material accumulation analysis, and microbial species identification in factory wastewater. It can analyze more than 100,000 pieces of data in one minute, making it suitable for applications in the environmental engineering, biomedical, pharmaceutical, semiconductor, energy, and battery industries. Lastly, the In-line Multi-channel Liquid Particle Inspection System is a tailor-made solution for the semiconductor, biomedicine, and cosmetics industry. It can be directly integrated into the production line to provide automatic multi-point analysis and a 24-hour real-time data feed to accurately monitor changes in the number of micro- and nano-particles, track the status of the water quality and treatment tank system, and improve the efficiency of the cleaning process.

Thanks to its unique arsenal of exclusive world-leading technology, FlowVIEW has established close relationships with semiconductor and chemical companies in Taiwan, Japan, Korea, Europe, and the United States, and the company's customer base is rapidly growing. FlowVIEW has also expanded its presence in Taiwan with an office at TTA South as the company plans to continue working with its customer base in Taiwan while accessing the international markets. The company aims to become the leading brand in nano-biosafety testing instruments and hopes to set new standards for nano-detection instruments in the EU and the U.S. in the coming years.

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THE DEVELOPMENT TREND OF AI IN SPORTS TECHNOLOGY

Artificial intelligence (AI) empowers the sports industry to establish a service workflow centered on data analytics and forecasts. AI algorithms provide fast and accurate analysis to effectively boost athletes' performances.

IEK Consulting
Jenny Lu

1. Development trends in the sports industry

Technological evolution has been driving the global sports industry toward smartness and data. Many sports analytical tools and techniques are gradually taking shape and amassing an increasing amount of sports data. The sports technology market has shown significant growth as a result. According to the sports technology market report by MarketsAndMarkets, the global market value reached US$15.7 billion in 2020 due to COVID-19, and it is estimated to reach US$40.2 billion by 2026 at a CAGR of 17.5%. Over the forecast period, the sports analytics segment is expected to report the highest CAGR of 26.4%, followed by the smart stadiums segment at a CAGR of 21.2%.

Many professional sports organizations have been using new technologies such as data analytics, smart stadiums, wearables and esports to enhance team performance, attract fans and provide smart infrastructure. Due to the increase in the number of sports events, smart stadiums have become one of the drivers for the development of the global sports technology industry. The innovative technologies for smart stadiums have initiated many R&D projects around the world. This helps the development of the sports industry in Europe and Asia Pacific and creates great growth opportunities for the sports technology market. The emergence of wearables promoting man-machine interactions also pushes the growth of the sports technology market. Such equipment includes activity trackers, smart clothes, smart glasses, smart watches and virtual/augmented reality devices. Wearables allow for hands-free operation, network communication, data analytics and real-time data monitoring. In the sports technology market, the growth of esports is primarily due to increasing penetration and promotion of electronic games.

The CAGR numbers indicate the sports industry's emphasis on sports data analytics. In fact, the use of statistics and data analysis has come a long way in the sports industry. In the example of baseball, the statistical analysis of baseball players' performance was already popular in the U.S. back in the late 1970s. The Society for American Baseball Research (SABR) named the series of sports statistics and analyses "Sabermetrics" or baseball statistics. As the various sports data collected serve as the foundation for quantitative analysis, this becomes the catalyst for the development of artificial intelligence (AI) in the sports technology market. Countries around the world were forced into a lockdown status at the outbreak of COVID-19. Whilst sports events resumed months later, the audience was still unable to enter the stadiums to watch live games. This meant that players had to compete in an empty stadium. HearMeCheer, a sports start-up in Canada, came up with a solution so that players could hear cheering as if the stadium were packed with fans. This technology combines AI and VR (virtual reality) and transmits a collection of audience cheering sounds to the stadium during live games. Meanwhile, IBM's Watson also uses the cheering sounds from previous tennis games to train AI models, in order to provide audience cheering for live games of the U.S. Open. AI and machine learning technologies are generating new applications in sports technology for the post-pandemic era.

AI and machine learning technologies enhance the ability of information gathering and analysis and empower quick decision-making with minimum human intervention. Machine learning techniques are used to perform statistical analysis on datasets to gain a deep understanding of a team's overall performance. The development of high-performance computing capability makes it easy and practical for sports organizations to use predictive methods to analyze games. AI is also being used to process game data and analyze which circumstances are more likely to cause sports players to suffer injuries. Hopefully, this will eventually prevent injuries.

In sum, the sports technology market will continue to develop with AI technology powered by high-performance computing. The growing application of AI and machine learning will help to analyze

players' performance enabling the timely adoption of corrective measures in order to boost their overall performance.

2. Main AI applications in sports technology

The sports industry had limited sources of data in the past, and most analysis was conducted by humans. However, the emergence of many smart technologies allows the use of wearables or peripheral sensors to track and record the speeds and trajectories of balls as well as the gestures and motions of players. AI technology enables the sports industry to establish a service workflow centered on data analytics and predictions. Whilst it is not a panacea for all challenges, AI algorithms provide fast and accurate analysis to effectively enhance the performance of players. It assists in the initial talent selection and training and supports the judging decisions in sports events. Injury prevention analysis can assist players in avoiding health problems due to overloading. Based on relevant use cases in sports competitiveness, health management and prevention, there are four major categories of AI applications in sports technology – talent recruitment, training programs, virtual referees and injury prevention.

Talent recruitment

Investing in sports players is essentially a bet. It is necessary to identity and screen talents for recruitment. In the past, ball teams tended to manually record the sports data of players and predict who might be the next rising star. However, the use of AI technology can predict players' performance using multiple factors. This affects the future careers of players at the outset. Peripheral sensors collect relevant data such as facial recognition and sports images. Therefore, teams can constantly monitor data, compare with historical data for analysis, use AI to predict the performance potential and market value of players. This serves as a reference for teams to make investment decisions. NBA Global Scout is an AI application and platform that analyzes videos uploaded by users and determines their performance in specific exercises. AI-empowered talent predictions also reduce the human bias in the recruitment process. This is fairer for players. It also helps to uncover hidden talents in countries where these specific sports are not popular.

Training programs

When a coach assists sports players in the formulation of training programs and competition strategies, the use of AI in performance analysis and predictive modeling creates greater benefits. Wearables and AI-enabled smart cameras can collect a large amount of sports data (such as ball passing, scoring and ball trajectory) from players during their routine practice. This data can be analyzed with machine learning and deep learning algorithms to provide the coach with useful predictive suggestions. The forecasting of an opponent's regular playing style helps players to make timely adjustments to their own training programs. According to the 2019 report by MarketsAndMarkets on the sports industry, AI technology will enhance individual performance by 17% and team performance by 28%, respectively. It has been deployed in a variety of sports. For example, IBM Coach Advisor integrates physical indicators, traditional tennis data and sports videos into a real-time viewing and predictive tool for coaches with the U.S. Tennis Association. This provides an insight into the relationship between physical output and the performance of players, so that the coaches can quickly plan the physical training of individual players.

Virtual referees

One of the earliest use cases in sports events of the introduction of technology was to help referees to make more accurate judgements. Different types of AI-assisted image interpretation technologies have been deployed at international games such as cricket and tennis. The Hawk-Eye technology helps umpires to determine whether a tennis ball lands inside or outside the court. Virtual Assistant Referee (VAR) is the technology used in football. These AI technologies enhance the objectivity and fairness of judgements in sports events. The rough human judgement of umpires in cricket matches of the past often caused anger among players. The emergence of AI technology has significantly enhanced the fairness of cricket. The VAR technology allows playbacks in slow motion for referees to facilitate accurate judgement, at the expense of slowing down the matches. The newest AI algorithms have even resolved this problem, with quicker and more accurate review of action in games.

Injury prevention

AI analytics and prediction can also be used in medical diagnosis. Health is the fundamental factor of performance and happiness among sports players. AI systems can go through a long list of physical parameters (e.g., movements) to assess the physical condition of players or even detect the timing of physical injury and its impacts even before the players themselves become aware of it. The use of a variety of sensors to collect data is particularly important to medical and health data analytics. The data gathered by wearables and sensors within a stadium can be used for data analytics and feedback and injury management after sports events. Sensors are placed underneath clothing to monitor the player's heart rate and fatigue level, in order to facilitate injury prevention and analysis. When attached to clothing or implanted into the player's body or skin, AI devices incorporating microprocessors can send or receive data as part of the Internet-of-Things (IoT). This technology has been widely used to provide real-time responses for players. In other words, players can retire from a match to avoid injuries based on AI-enabled injury prevention and analytics. The great ease-of-use and declining costs are making wearables increasingly popular, with the addressable market expanding from professionals to amateurs. The MarketsAndMarkets report suggests that wearables are the fastest growing segment of the sports equipment market.

3. AI start-ups emerge as providers of value-added sports and health services

Zone7: development of an AI platform to accurately predict sports injury risks and effectively prevent injuries

1. Background: Prevention is better than cure. An increasingly accepted concept and the pursuit of "accurate" solutions to prevent sports injuries

Sports injuries affect the body and alter the risk profile of subsequent injuries. "Prevention is better than cure" has become an increasingly popular concept during recent years. For professional athletes, the prevention of sports injuries is particularly important. One injury may suspend a player from practice and matches for weeks or months. The worst consequence may be the early end of an athlete's sporting career. Zone7 was founded in 2017 in Silicon Valley, California, as a developer of an AI and machine learning platform to help sports organizations predict sports injuries and boost players' performance. To date, Zone7 has worked with more than 50 teams in North America and Europe under different sports leagues such as the National Football League (NFL) in the U.S, the Premier League in the U.K., La Liga in Spain and Serie A in Italy. Team bosses invest millions or billions of U.S. dollars on players and naturally do not wish to see poor performance or departure due to injury. Sports data analytics protects the interests of the teams and the value of players. The success of the sports industry depends on the health and performance of players. Previously, the use of data to boost performance was in the preliminary stage. Zone7's technical team has pushed AI-driven sports data analytics to a new level for the prediction of injury risks.

The company raised US$2.5 million in early 2019 and raised US$8 million in Series A funding led by Blumberg Capital, a venture capital company based in San Francisco, to help with the expansion of its influence in the sports industry. Other investors Resolute Ventures, UpWest, PLG Ventures and Joyance Partners all participated in Zone7's seed funding.

2. Services: prediction of injury risks with AI and data, to quantify and monitor the relationship between a player's performance and health in order to achieve the perfect balance

Zone7 strives to enable sports players to safely fulfill their potential. Its AI platform gathers and analyzes data collected when players train, compete and sleep, generates health reports for each player, predicts near-term injury risks and advises their coach or medical personnel on ways to provide assistance to players.

Zone7's AI platform analyzes health and sports injury data. Professional athletes suffer injuries typically due to multiple factors. A general management system for sports players or a simple statistical model helps to visualize the workload trends but cannot identify the various reasons for injuries. Injuries are usually caused by insufficient biological preparation; historical injuries; unhealthy lifestyle; and the schedule of games. Therefore, the plotting of each player's risk profile requires big data from differ-

AI and machine learning technologies enhance the ability of information gathering and analysis and empower quick decision-making with minimum human intervention

ent sources in order to fully understand injury risks. The analysis of multiple dimensions of data is highly complex. Without the use of AI, it is virtually impossible to identify the correlations.

Zone7 provides an AI cloud service platform for data collection and analysis primarily in three aspects: data gathered with day-to-day devices connected to games, training, medical and performance indicators. Risk profiling is established with data analytics for each player. Objective risk intelligence is provided on a daily basis. The real-time perception of the player's physical condition serves as a pre-warning system. This can be used for dynamic management of training loading and enhancement of the player's performance (Figure 1).

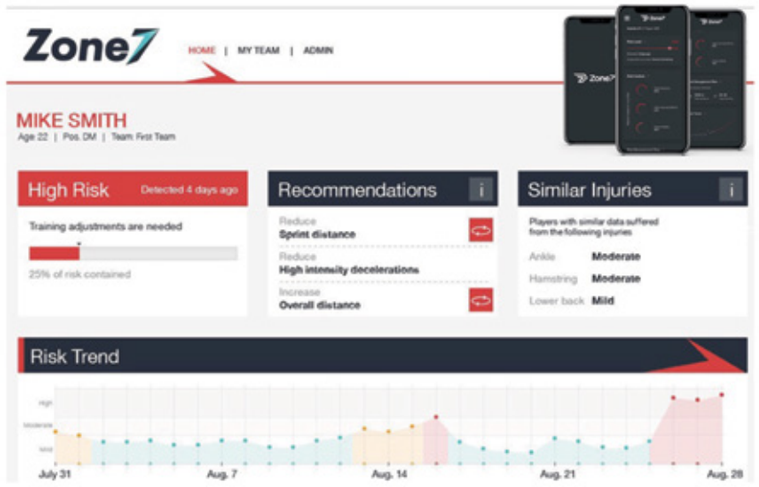

Figure 1. The Zone7 AI platform provides predictive services on sports injury risks - risk profiling **Source: Zone7's official website**

Zone7 has collected over 100 million hours of physical and performance data from thousands of players using Garmin wearables and Apple Watches. The data is analyzed with AI to identify the key factors attributing to injuries or performance issues behind the data in order to produce predictions. The analytical results can discover potential risks early, avoid injuries to players and enhance the team's performance. Zone7 collaborates with the medical personnel of the sports team and suggests immediate adjustments to sports activities to reduce injury risks. For example, advice is given on how fast or how far a player may be required to run during the next training session in order to avoid injury due to over-exercise. The combination of AI-driven sports technology and data science can successfully identify the patterns of injuries. Zone7's AI platform has been tested and used by 12 leagues and proven to be able to reduce the number of injury days by 70% and the injury rate in sports teams by 75%.

Meanwhile, the Zone7 platform can establish comprehensive risk profiling for specific teams. Each risk alert identifies the parameters with a significant influence on injury risks. The findings suggest that the medical conditions of players are the biggest factor affecting injury risk. These parameters include the number of past injuries and the time since prior injuries for each player.

3. Technological innovation: AI platform enhances risk management and competitiveness and offers effective services for sports injury prevention

a. Data access and validation methods

With the data from teams or players, Zone7 establishes medical and biomechanical profiles of individual players. In addition to personal data, Zone7 applies quantitative techniques to analyze the amount, the intensity and the stress of exercise for players over a period from four days to six months. The dataset generated in this stage consists of only relative values, in order to compare and contrast the amount of exercise at a given timepoint against the standard amount of service.

b. Injury risk predictions powered by AI and machine learning

Pattern recognition as a mathematical technique is used to train AI and machine learning algorithms and assess injury risks. The optimal injury risk point can be identified according to different input parameters and the correlations between parameters.

c. Risk management solution

Three steps are carried out after the prediction of sports injury risks. First, all risk inducing factors of high/medium risks levels are extracted. This is followed with the exploration of the team data and the identification of a suitable workload template. Duplication of this template resolves injury risks. Finally, a comparison is conducted on the data leading to specific risk alerts and the data of historical injuries to provide the players with warnings for the most likely types of injuries (Figure 2).

Catapult – Athlete Management System (AMS) combined with wearables to monitor the health and training of sports players and enhance the performance of teams

1. Background: integration of sports data collection and analysis to provide a total solution for the health and performance of sports players

Catapult was founded in 2006 by the Australian Institute of Sport (AIS) and the Cooperative Research Centres (CRC) in Melbourne, Australia, with the initial purpose of optimizing the performance of Australian athletes ahead of the Sydney Olympics. At the outset, the company developed wearable technologies only to resolve basic issues concerning the sports performance of athletes. Catapult has evolved from a startup to the global leader in sports technology and offers total solutions that influence the sports performance of athletes. It started with the tracking of training statuses by using wearables and has developed into athlete management and sports video analysis. Catapult strives to provide new technologies for athletes of different levels to enhance their performance. In addition to cooperation with the world's largest sports teams and organizations, Catapult has extended its services to the consumer market so that amateurs can also constantly monitor their performance in the same way as professionals. With strategic acquisitions, Catapult has maintained its leadership in sports technology and innovative applications. The company (ASX:CAT) has been listed on the Australian Stock Exchange Limited (ASX). It has over 340 employees at 30 locations and works with 2,970 teams in 39 sports.

Catapult's wearables are must-haves for many NBA teams, for the tracking of running distances, speeds, jumps, heart rates and ankle pressures. The data is transmitted to the AI-powered Athlete Management System (AMS) for further analysis. This helps coaches and team doctors to stay on top of each player's exercise amount and physical condition allowing them to adjust the timing of the player being in the game or sitting on the bench. This also allows players to know how to find the ideal balance between training and resting. The system's program can be customized for the physical condition of each athlete and provides warnings for likely injuries. As the top-notch company in sports technology, Catapult's equipment and systems are the most widely used AI-enabled wearables in the world of sports today.

2. Services and Technological innovation: Combination of the wearable technology and the AI platform to provide health management services to athletes in order to enhance sports performance, reduce injury risks and help with a quick return to the game

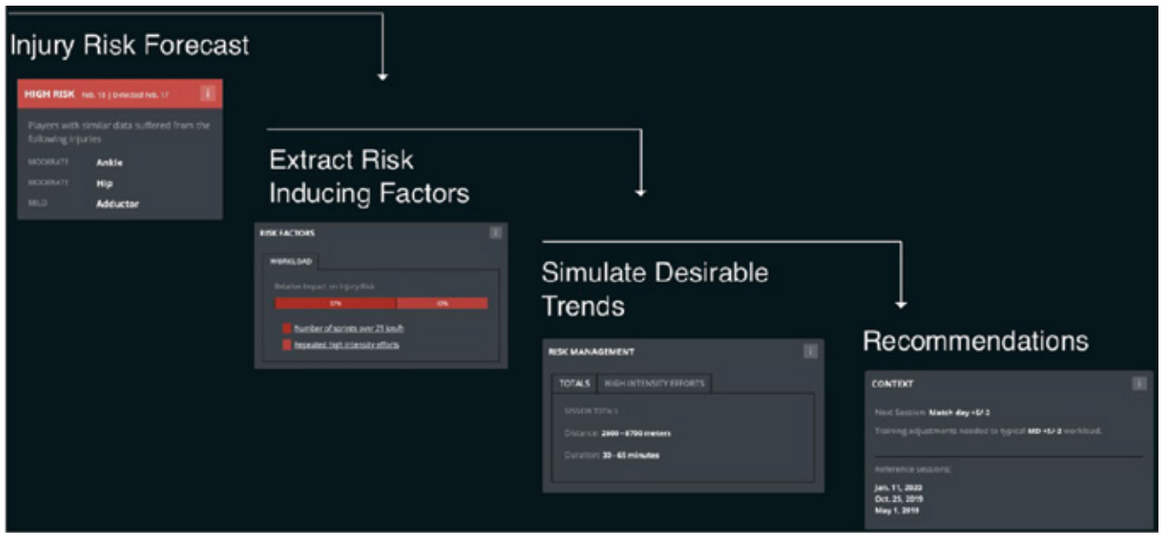

Figure 2. Service flows of AI-enabled predictions of sports injury risks **Source: Zone7's official website**

Figure3. AI-powered Athlete Management System (AMS) interface

Source: Catapult's official website

The AI-powered Athlete Management System (AMS) is designed for athletes to store information, interact and communicate. Different from the previous mode of interactions across the organization, the sports data is viewed on the platform in a real-time manner. This effectively helps teams to streamline workflows and reach the right decisions. The automated API services integrate all the data from athletes from mobile devices such as mobiles and tablets. Health data from athletes is analyzed and tailormade reports are generated. It is also possible to set up a warning mechanism based on the analysis of data from multiple sources. The platform facilitates easy communication, so that players, teams and doctors have the same information. This helps sports event scheduling and review of sports performance reports.

The AI platform primarily provides three services: wearable technology, video analysis and athlete management (Figure 3).

a. Wearable technology

Sports data that cannot be measured cannot be managed. The use of Catapult wearables optimizes sports performance, effectively reduces injury risks and assists in a quick return to the game. Its wearable technology has been independently validated and is trusted by over 2,500 teams around the world. The collected data is utilized for the management of athletes' health and exercise routines. This enables sufficient preparation before competitions and boosts the performance of sports players. It also establishes a further understanding of injury risks and avoids preventable injuries by monitoring exercise loading through quantitative training. Injuries caused by carelessness can be objectively managed for recovery through certain indicators that help athletes to safely return to the game.

b. Video analysis

Catapult Vision is a solution in video analysis. Its clear and powerful analytical strength can simplify the workflows and processing time by 24%, so that coaches have more time to interact with players. Catapult Vision accelerates the workflow and enhances the efficiency of video analysis and also encourages the athletes' engagement in the training process. The data collected by wearables and the image analysis and prediction from the AI platform encourage conversations with players and reduce the team's spending on video analysis.

c. Athlete management

Catapult's athlete management solution improves the collection, storage and sharing of critical sports information and the efficiency of workflows.

Catapult Form is a wellness solution for athlete feedback and management. It captures athletes' feedback on mobile devices and enhances warning specifications via the digital dashboard and data analytics package of the platform. This helps teams to obtain essential data and make immediate decisions. Data is collected with wearables. All the important data is safely gathered onto the platform for analysis. Catapult Form prioritizes information security and ensures data processing in compliance with the GDPR and HIPAA regulations.

IEK View

During recent years many industries have explored the idea of developing AI use cases. People are more concerned with the suitability of applications and the solvable problems. This can be divided into two aspects: the use of AI to resolve problems previously not solvable and for new services and use cases emerging in the wake of AI. Many startups overseas are seeking to further integrate sports and healthcare. System integration and service flows reengineering can bring about transformations and innovations to the sports industry.

AI empowers feasible solutions in many industries. Its technological characteristics address two issues, i.e., health status tracking and risk predictions in the workflow of the sports industry. The two international benchmarks, Zone7 and Catapult, mentioned above, have come up with technological innovations and services by using AI in sports health management and injury prevention workflows. Performance can be effectively optimized by predicting the health condition and risks of sports players. This avoids potential risks, assists the smooth operation of teams, and reduces the cost of monitoring athletes.

Sports are more popular overseas, where there is a well-established ecosystem of sports technology. More resources are available for the development of sports data analytical software to help further augment the construction of the sports technology ecosystem. In contrast, the sports industry in Taiwan is still faced with digital transformation. Most tech startups are in the fledgling stage, and there is a shortage of multi-disciplinary talent with domain knowledge of sports. As a result, there is inadequate experience for the development of a diversity of sports platforms. As sports in Taiwan are gradually expanding from professional players to general leisure activities, the industry will continue to grow. Taiwan can assist startups with policy support, help in the synthesis and integration of domain knowledge and platform development in the sports industry and continue to promote new use cases in sports technology. This will make sports part of the new norms of life for the public, make Taiwan the training center for professional sports in Asia Pacific and establish a strong presence in sports technology development.

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Mucker Capital to Launch its Accelerator – MuckerLab in Taiwan to Support Startups over the Long Haul

Jerry Chen is an investor at Mucker Capital, a premier early stage venture fund investing in companies like Honey (acquired by PayPal for $4B) that power the digital world. He brings strategy and operating expertise gained through experience working across three continents including Asia, Europe and America.

Jerry Chen

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Prior to joining Mucker Capital in the US, Jerry held a global strategy role at Bayer in Germany, Taiwan and China. His proficiencies span across sales & marketing, new product launch, supply chain, and M&A. Before building up his own digital health startup, Jerry worked at McKinsey & Company and National Taiwan University. He holds a BS in Electrical Engineering from National Tsing Hua University in Taiwan and a MS in molecular photonics for bio- and nanotechnologies from École Normale Supérieure Paris-Saclay and a MBA from Collège des Ingénieurs in France.

Mucker Capital started its startup accelerator program – MuckerLab, in 2012 and currently manages more than US$300 million (NT$9 billion) in funds. MuckerLab is not your typical accelerator program where hundreds of companies are “accelerated” each year using a cookie cutter approach.

“We don’t churn through hundreds of startups every three months in order to help just a handful of top companies.” Jerry stated. “Instead, we work with a small number of companies per year, doing whatever is necessary -- for as long as necessary -- to ensure that each and every company achieves the operating milestones required for the next round of financing,” he added.

“Our hands-on, boutique approach has allowed us to achieve extraordinary success rates and founder satisfaction scores. In fact, MuckerLab was ranked the number two accelerator in the United States. Our bespoke support model allows us to deeply embed ourselves as adjunct operating executives in companies at their earliest stages as well as those going through major inflection points,” Jerry continued.

Jerry believes that startup ecosystems around the world should look to discover their own unique selling points. Since Mucker Capital has long focused on investing in software/internet-enabled businesses, software-as-a-service (SaaS), and digital transformation, the company has observed first-hand the characteristics of startups in different regions and cities as well as the value that comes with their respective application scenarios.

After returning to Taiwan in 2020, Jerry began investing in startups in the Asian market, such as GoFreight, freight management SaaS for international freight forwarders. According to Jerry, it provides real-time freight visibility and all-in-one software solution for freight forwarders. Mucker Capital has also helped GoFreight scale its business and build up a capable team in the US. GoFreight’s freight management software for freight forwarders helps manage the planning and execution of import and export shipments for all modes of domestic and international transportation. Having raised over US$4M, GoFreight will continue to help unleash the potential of freight forwarders.

As entrepreneurs, Jerry and his partners know how to help startups find their product-market fit. He is familiar with how to start a business and help it grow. Jerry understands as well as appreciates the intricacies of risk management and assessment. Jerry said that investing in early-stage startups entails higher risk but also promises a higher return.

Presently, MuckerLab has already invested in academic research teams under the Ministry of Science and Technology. For Jerry, helping startups is more than just monetary investment; more importantly, the goal is to help startups expand internationally and find landing opportunities abroad.

There is no formula for innovation; it's all about trying. During his time as a student in Taiwan, Jerry observed that education consisted mostly of teaching to the test. Nonetheless, he encourages new startups in Taiwan to find their own way and be proactive and dedicated to their entrepreneurial endeavors despite the absence of a sure success formula. It is imperative for startups to be able to tackle problems head on and find ways to deal with the situation fearlessly when things don't go according to plan. Jerry said that this was the difference between an owner mindset and a guest mindset.

Startups need to actively look for answers to things they don't understand while coming to terms with the fact that there may be more than one answer to any given problem. Pursuing a solution to a problem without a fixed answer is probably one of the most valuable experiences one can have. For Jerry, this key to success was something he learned after years of working with professionals from different countries.

Besides the startup ecosystem in northern Taiwan, MuckerLab is also actively engaging in the ecosystem in central and southern Taiwan thanks to TTA and its Black Card membership which provides him with access to pipelines of startups across Taiwan.

Jerry compares the startup ecosystem in northern and southern Taiwan to that of Silicon Valley and LA. Back in 2012, startups and funding were concentrated in Silicon Valley, but lately, LA has become one of the top 5 startup ecosystems in the US. Similar trends can be seen when comparing the US to Taiwan, and Taipei to the south.

Jerry is quite optimistic about the traditional industries in Southern Taiwan where, in fact, a number of global hidden champions are located. He hopes to help local startups while introducing global startups to the region to disrupt the status quo, ultimately making the startup ecosystems in both Taipei and the greater south more vibrant. His goal is to help traditional industries find a clearer path towards digital transformation and become aware of resources that are available for them to make that change.

Jerry said with confidence that in areas where capital and resources are scarce, one must find unconventional ways to start a business. That is exactly what MuckerLab does best: building good companies by making the most use out of every bit of capital.

Jerry also shared his experience in working with startup communities. He said that throughout his time working as an entrepreneur, as an employee in large companies, and as a friend to innovative minds in the West, he would find streams of out-of-this-world inspirational ideas which later turned reality through hard work, grit, and perseverance. For entrepreneurs, the process is what enables them to actualize their vision and what makes them realize that anything is possible.

This is why since the beginning of 2021, Jerry has been holding monthly events—as he often did in the US—for investors, startups, and people interested in innovation and investment. These gatherings are not just opportunities for people to network but also the place for venture capitalists, startups, and entrepreneurs to exchange and spark new ideas which may eventually become the fundamental building block of future entrepreneurship and cross-disciplinary collaboration.

In the next five years, Jerry said that MuckerLab and Mucker Capital will continue to invest in North America and Asia. With the addition of more talents, they will be able to help startups anchor their positions in the market and help them define their strategy and products. As more early-stage investors join the scene and the government's support, Taiwan's startup ecosystem will continue to grow.

Infinio Capital: Building Taiwan's Next Titan Industry

COVID-19 has forced business owners around the world to either close down or start a new business from scratch, giving rise to startups in different industries everywhere. Christopher Teng Balmaseda, a venture partner at Infinio Capital, a venture capital firm, and a member of TTA Black Card community, shared some of his observations and outlooks on the startup ecosystems in Taiwan.

Christopher Teng Balmaseda

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Christopher graduated from UC Berkeley and completed his graduate program in Biochemistry and Molecular Biophysics at California Institute of Technology. After receiving his Master's Degree, he started working at a battery supplier in Taiwan, where he gained in-depth knowledge and experience about the high-tech supply chain as well as developed expertise in business expansion and industrial development.

Christopher founded his own company, an energy solution provider, in 2009. Despite the company's initial success, Christopher kept longing to realize change and make the world a better place. Therefore, he continued analyzing and learning about a variety of technology services and products, such as TikTok and other online platforms. In the end, he decided the best way to help companies attain success and pass on his business acumen and experience was by joining a venture capital firm.

Christopher has connections with a lot of people in Taiwan and has established ties and entered into collaboration with a wide range of business groups as well as leading global high-tech companies. As a member of the chambers of commerce in both Taiwan and the U.S. and the Overseas Community Affairs Council, he often exchanges ideas with his counterparts and other leading figures to integrate resources and foster mutual development with the goal of forming a global technology supply chain.

A venture partner at Infinio Capital, Christopher returned to Taiwan to establish a business in order to create new business opportunities and help Taiwan gain visibility at a global scale. The first things that come to mind when people think of Switzerland are watches, chocolates, and army knives. But what about Taiwan?

Taiwan is an important link in the global supply chain of semiconductors, hardware, and smart/precise manufacturing, with a reputation for its cost efficiency. With the current inflation and skyrocketing prices of commodities and goods, now more than ever, enterprises are in search of cost-effective manufacturing and corporate management. Christopher believes that Taiwan has been and will continue to be the best industrial partner of the world.

The aerospace sector was driven by the dream to send people to the moon and outer space. Christopher spoke about the ecosystem and investment aspects of the aerospace sector. For instance, an important reason why no second moon landing was planned is that such an aerospace project implies unimaginable costs. Yet, as stated in the novel The Alchemist, "When you really want something, all the universe conspires in helping you to achieve it." Christopher feels really excited about the maturity of the manufacturing technology in Taiwan and its cost-down capability. This can help the aerospace sector become more affordable for not only for the government and academic institutions, but also for citizens globally.

In reality, the aerospace sector is not just about landing on the moon, shooting rockets, and traveling to outer space. It encompasses industries such as satellite manufacturing, 5G applications, information and communications technology, geospatial information sharing, Big Data, and so forth. "Satellites above the sky could be able to predict the frequency of earthquakes precisely some day in the future, helping to save lives," Christopher said.

With its cost-effective manufacturing capability, Taiwan is an ideal partner for aerospace businesses around the world. Using Jeff Bezos and Elon Musk as examples, Christopher mentioned how Blue Origin and SpaceX—two cutting-edge aerospace companies—are eager to make it possible for more and more people to get off the surface of the Earth.

In 1969, the Space Race was a competition in which the Soviet Union and U.S.—the two largest powers at the time—vied to show off their technological capabilities and the outcomes of their scientific research. It was a pyrrhic victory, however, for the U.S. to some extent. Nowadays, such aerospace competition, ineffective in terms of cost, is barely feasible.

Nonetheless, Christopher believes that with the emergence of AI, AIoT, Big Data, and plenty of other new technologies and applications, the aerospace sector can finally accomplish cost-

effectiveness. With this hope and ideal, Infinio Capital and Christopher have focused on investing in aerospace-related startups and are eager to help connect them with multiple stakeholders in the aerospace sector worldwide.

Taiwan's outstanding handling of the COVID-19 pandemic—it is one of the least affected nations worldwide—has greatly impressed Christopher. He is fascinated by the friendly people, the great public safety, and the large number of experts in different industry verticals within the country. Furthermore, the Tsai administration and the Ministry of Science and Technology have opened their arms to experts from abroad and striven to create a welcoming environment for international talents. Christopher is a member of TTA Black Card community and is really grateful for the opportunity to get to know and interact with numerous other renowned entrepreneurs, such as Steve Chen, the co-founder of YouTube and Patrick Lee, the co-founder of Rotten Tomatoes.

As a venture partner, Christopher has observed some differences between the startup ecosystems in the U.S. and Taiwan. Firstly, "fit tech" is more important than "high tech". Entrepreneurs in Taiwan are good at developing technologies and manufacturing products of extremely high quality, but do higher specifications mean the product is the best or perfect for customers?

Apple Inc. can teach us all a valuable lesson: a product suitable for customers does not always include the most cutting-edge technology but the fittest one. The iPhone does not come with the largest screen nor the best camera, yet it is still one of the most popular smartphones in the world. In Christopher's opinion, instead of high specifications, startups should put more emphasis on the unmet needs of clients or customers. This would increase their probability of successful sales.

For instance, NASA still applies PowerPC on its infrastructure in order to mitigate the impacts of low temperature, radiation, vibration, and so forth. To industries such as national security, healthcare, and public affairs, stability and sustainability are sometimes far more important than creativity and innovation.

Secondly, the ability to communicate is the backbone of international business. From the viewpoint of venture capital and global investors, Christopher strongly suggests Taiwanese startups to cultivate English communication skills and enhance their storytelling ability to attract potential investors, as they do not only pay attention to technology; the communication skills of entrepreneurs are equally essential.

Being a compelling public speaker is a must for entrepreneurs. One should talk about the problem and how it is addressed in detail, instead of spending tons of time trying to explain the technology used. Only thus can one catch the eye of investors. Christopher mentioned that 886 Studios is also dedicated to helping entrepreneurs develop their international communication abilities.

Third, one must be willing to spend more on marketing and branding. Startups don't always regard this as a necessity, but if the company would like to sell its products and services abroad, it must make a name for itself in the target market.

U.S. consumers recognize Samsung and LG as Korean and Sony and Panasonic as Japanese, said Christopher. Yet despite being well-known in the U.S., Acer and Asus do not immediately bring to mind Taiwan. Branding and marketing are two of the professional domains that Christopher strongly suggests startups to develop and to find the most suitable way and best timing to promote their business.

The startup ecosystem in Taiwan is unique and so is that in Silicon Valley. Each ecosystem should follow its own path, creating a one-of-a-kind environment for itself and its startups. Only a few venture capital firms tend to invest in foreign early-stage startups, despite the fact that they need more assistance and funds than startups in the Series B or pre-IPO stage. Infinio Capital stands by early-stage startups and believes in investing in companies with high potential for exponential growth. The risk is higher indeed, but the reward is even greater, as the startup may go public or become a unicorn.

When it comes to startup investment, the personalities and traits of entrepreneurs cannot be stressed enough. In Christopher's opinion, an investable founder should be: sharp, smart, has grit, and always wanting to solve problems, no matter how difficult they are. If a solution seems to be unattainable, one should know when to pivot and find a new way out. It sounds merely like the fundamentals of starting a business, but it is the true essence of an entrepreneur.

Also, good business leaders must be able to inspire their peers, persuade and encourage their team members to face challenges persistently. Of course, even introvert entrepreneurs can have an impressive ability to reassure their crew.

"Be wise with your money." Christopher strongly recommends startups to spend their funds carefully, effectively, and correctly. How a startup spends its money speaks to investors about the company's decency and judgement. A cost-effective way of running the business, or you could call it a "lean" strategy, could make a far better reputation for a startup than a team that uses money profligately. "Resources are limited, yet chances are infinite. Put the precise amount of money into a project and cook the ideas with patience."

As a Black Card member of TTA and a venture partner of Infinio Capital, Christopher is now a resident at TTA in Taipei. Infinio Capital has also set up an office at TTA South in Tainan. Christopher loves TTA in Taipei and really looks forward to spending time in TTA South, especially because of the aerospace talents in southern Taiwan, mainly from National Cheng Kung University in Tainan. Christopher praised the aerospace talents of National Cheng Kung University, the faculty members, graduate students, and undergraduate students included. Additionally, the Taiwanese government plans to invest NT$25.1 billion (equivalent to US$900 million) in the aerospace sector over the next decade.

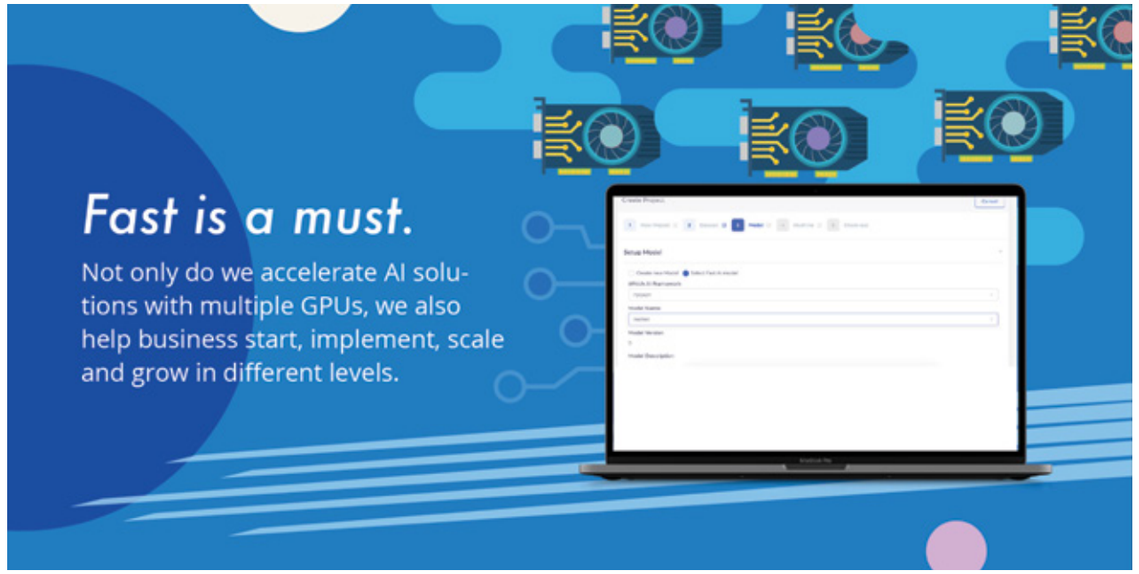
It is the best chance for talents in southern Taiwan to collaborate and build a new booming industry and an innovative ecosystem in the 10 years to come. The flow of numerous talents to northern Taiwan has overpopulated the region. Thus, Christopher expects to see a brand-new atmosphere in Tainan, Kaohsiung, and Pingtung, the major cities of southern Taiwan.

But the infrastructure in certain areas of southern Taiwan needs to be more modernized and prepared before these cities become ready to welcome talents from around the world. There should be more stores, restaurants, shopping malls, or schools in the science parks, said Christopher. With more integrated, comprehensively-structured, and multi-functional public services conducive to work-life balance, the innovation-, talent-friendly atmosphere there could draw an increasing number of people, resources, and creativity to simultaneously pour into the region.

In the next 5 years, Christopher would like to help Taiwan build a world-class startup ecosystem for the aerospace and other software-related sectors. Christopher's dream is to boost the aerospace sector in Taiwan so that it parallels the astonishing progress of the country's semiconductor industry. It might take some time for foreigh investors to take a closer look at Taiwan, but Infinio Capital and Christopher look forward to serving as intermediaries and give wings to entrepreneurs and the startup ecosystems in Taiwan, so that they fly across the globe and out into space.

STARTUP STORY

When TTA was officially launched in June of 2018, many of the startups we supported were early stage startups looking to raise seed capital. Three and a half years into our program, TTA is proud to see that many of our alumni startups are still going strong and now raising Series B and even Series C funding as well as winning internationally recognized awards.

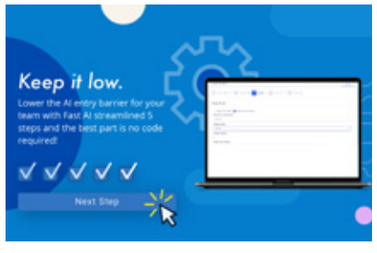


Avalanche Computing

Haisten AI—Bridging Innovation with Reality and Shortening Project Timetables

AI has become an indisputable trend in the technology industry. The market has been swamped by a stream of AI-based smart services such as smart transportation, smart medicine, and self-driving cars. Many research institutes are also encouraging enterprises to adopt AI technology in order to accelerate their internal digital transformation process. With GPU performances rising rapidly and open-source AI algorithms more accessible now than ever, enterprises can enjoy much lower entry thresholds into the field of AI than ever before. However, it is also true that many challenges still remain and that not all enterprises can transition smoothly into the age of AI.

Statistics show that enterprises hoping to integrate AI technology will likely face the following obstacles: lack of human resources, availability of computation resources, and time constraints. Currently, there is a fierce competition for AI talents, especially against major IT companies, and a shortage of engineers for AI teams. In addition, data scientists are too overwhelmed with work to focus on AI application development. Secondly, computation resources are expensive, development environments are complicated to set up, and optimization can be a daunting task. Finally, Training AI models is both costly and time-consuming. The lengthy training times often cause projects to take exceedingly long periods of time. Given such circumstances, it typically takes at least one year for enterprises to complete AI-related projects, while cases that take over two years are also extremely common. The Haisten AI software from Avalanche Computing is designed to tackle the aforementioned issues to help enterprises quickly access AI-driven results.



According to a study published by AI 100 in 2020, more than 70 percent of AI developers have to spend a lot of time building AI application environments and debugging development environments, said Jay Chen, Avalanche Computing CEO. To combat this problem, Avalanche Computing has introduced Haisten AI. This software service allows AI developers to focus on the AI model design process rather than waste time assembling hardware, setting up software environments, or optimizing the execution environment.

Haisten AI—Accelerating the Commercialization of Products

The team of Avalanche Computing is made up of engineers that formerly worked at NVIDIA's pursuit engineering solution architect (PESA) team. This has given the company an exceptional edge on deep learning technology and supermassive computation. The Haisten AI service provided by the company uses a software-as-a-service (SaaS) model that acts as a low-code AI development platform that is both fast and easy to use. Domain experts and AI engineers in various fields from different enterprises can all access one intuitive AI computing environment directly without having to work with complicated code. They can simply use the optimized AI computation environment to quickly and efficiently finish the training and deployment of their AI models. By doing so, enterprises can skip the AI environment construction and system optimization processes. Furthermore, Haisten AI can automatically access multiple GPUs and combine their computing resources for AI model training, significantly reducing training times. The one-click large scalable deployment function allows for the simultaneous deployment of various AI models to a large number of devices using a graphical user interface to facilitate not only AI development, but also application deployment.

In other words, Haisten AI allows domain experts and AI developers to focus on their professional work, dramatically increasing their productivity, making their programming life easier. This innovative technology has also made Avalanche Computing one of the 10 finalists in the Qualcomm Innovate in Taiwan Challenge (QITC) 2021 and one of Hello Tomorrow's Deep Tech Pioneers. The company has also been selected to join world renowned Berkeley SkyDeck Global Innovation Partners (GIP) Program with the support of the TTA team in Silicon Valley.

Thanks to the prevalence of public cloud services, enterprise users can save the heavy work of building AI computation hardware by renting GPU resources. However, debugging and optimizing the AI computing environment, AI model design, AI model training and deployment are time-consuming tasks that can delay projects. Jay stated that the goal of Haisten AI is to remove these troublesome tasks to let professionals focus on more meaningful work, so that computation resources can be effectively utilized to turn innovation into business models. Avalanche Computing has already entered into partnerships with manufacturing and medical vendors, and will continue to expand the applications of the company's software service to sow more seeds of success.

Avalanche Computing, for instance, has worked with a medical startup that focuses on providing breathing monitoring systems for medical professionals. The startup's smart stethoscope combines professional recording equipment with AI to give healthcare professionals the most accurate real-time information. In order to achieve accurate predictions, the team's data scientists had to repeatedly try different AI algorithms and adjust AI model parameters, which inevitably lengthened the product development cycle. Luckily, after introducing Avalanche Computing's Haisten AI software, they were able to overcome many of these problems. The startup also decided to move the development of their AI model to a cloud platform with Haisten AI. Haisten AI was then able to utilize multiple GPUs for the training process to validate the performance of each algorithm in much lesser time. In the end, data showed that the startup was able to accelerate their AI model development speed by more than three times, helping them to promptly seize market opportunities.

As AI becomes more and more prevalent, Avalanche Computing plans to keep working with its existing Taiwanese customer base while striving for more exposure and fundraising opportunities to enter the U.S., Japan, and Europe markets, among others, to create a better life for people around the globe through AI.

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Mindtronic AI

Backed by Multiple CES Awards, Mindtronic AI Enters Auto Supply Chain

With the deadlines approaching in various countries for bans on the sale of gas-powered automobiles, the global auto market is now looking to electric vehicles and their rapidly growing sales. Vendors in Taiwan have also stepped up to form an electric vehicle alliance to integrate Taiwan's industrial capabilities, in order to seize the huge business opportunities that come with this fast expanding market. Compared to the pricey electric vehicles, gas-powered cars with partial self-driving capabilities have been much more appealing to consumers with their promise to offer a next-generation smart driving experience paired with an affordable price tag. The launch of Ford's fourth-generation Focus, which is strategically equipped with level 2 self-driving capabilities for sweet spot global market positioning, immediately attracted other carmakers to follow suit with similar products. Priced at around NT$800,000, nearly half the price of an electric car, the Focus has pushed global smart car development to new frontiers.

Major car manufacturers have been able to launch cars packed with a variety of smart features with just a few years of R&D. This is not only due to the rapid advancement of semiconductor architectures driving down the price of chips and sensors, but also thanks to assistance from startups making clever use of AI technology. Among the sea of startups from around the world, Mindtronic AI was able to win for itself an award against intense competition at the Consumer Electronics Show (CES) 2020 for its self-developed Driver Monitoring System (DMS), Advanced Driver Assistance Systems (ADAS), and Human Machine Interface (HMI). In fact, the company has already received five CES awards in the four years since its founding, which is a testament to the company's outstanding technological innovative capability.

Mindtronic AI technical director Mike Huang said that car makers typically specialize in areas like transmission systems, chassis, vehicle designs, production, and sales. AI-based intelligent vehicle monitoring systems, however, are completely alien to them. Since car brands are unlikely to get immediate results from their in-house R&D teams, and it is also doubtful that they will be able to compete with outside organizations that are already familiar with AI technology, seeking external help naturally becomes the best option for auto makers. Mike said that after winning the CES award, Mindtronic AI started to work with Japanese, European, and Chinese car manufacturers. They have already made their way into the auto supply chain and are expecting to see their products used in new cars by 2022.

Mindtronic AI has been working in the field of artificial intelligence for many years with a focus on applying AI applications to automotive safety. In early 2018, the company launched its first smart AI dashboard solution. Later in the same year, it was nominated as one of the 10 most promising startups in the world by the CES Consumer Technology Association (CTA). Backed by its strong R&D capabilities, the company was selected as one of the Hello Tomorrow APAC Challenge Finalists in France. In 2021, it was selected by the German Trade Office Taipei as the best startup in Taiwan and one of the top three in Asia.

Overcoming Vehicle AI Challenges with Proprietary Edge AI Solution.

The smart car market has extremely high potential, so it has attracted many startups to enter the market, but few have been successful in working out deals with car brands. The reason is that AI technology alone is not enough to overcome challenges of real-time processing, uneven lighting, and unstable in-vehicle environment. Mike pointed out that when a vehicle is in motion, the system needs to be able to continuously recognize its surroundings, which means being able to make at least 30 calculations per second to ensure driving safety. Secondly, image clarity suffers greatly if the camera is capturing footage in uneven lighting. The AI must be able to correct the footage and make corresponding judgments in real-time to prevent the environment from impacting driving safety.

Mindtronic AI uses a lightweight deep learning framework/model that is fast, accurate, and power-efficient, which will automatically initiate self-driving system takeover if it detects that the driver is engaged in dangerous behaviors while the vehicle is in motion. Furthermore, the company has also introduced a self-driving edge computation AI technology that monitors the driver's facial expression and eyes to detect driver fatigue, making the self-driving takeover mechanism even more accurate.

In 2020, Mindtronic AI received mentorship support and startup resource assistance from TTA, the Ministry of Science and Technology, and the Ministry of Economic Affairs to help the company grow. TTA, in particular, connected the company with National Yang Ming Chiao Tung University's IAPS accelerator program. This led to the company's participation in the Taiwan Excellence Awards and other activities for increased global brand visibility and exposure to international fundings. Mindtronic AI plans to continue to invest in product optimization and look for collaboration opportunities with U.S. automakers to seize the huge business opportunities of the smart vehicle market.

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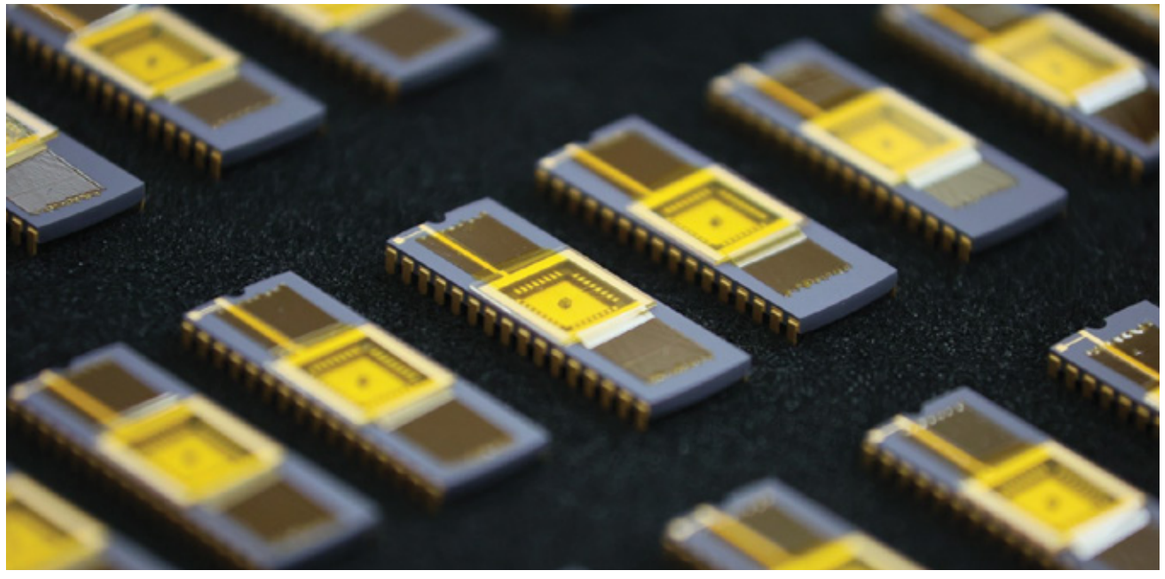

DeCloak Intelligences

De-Identification Technology: Securing Personal Information While Allowing Business to Analyze Consumer Behavior—A Win-Win for All

The ability to grasp data has become one of the key indicators of the increasing operational efficiency in the world of business. As public awareness on privacy issues continues to grow, businesses must identify solutions that can maximize data value while protecting people's privacy in order to enhance their competitiveness and establish a foothold in fiercely competitive environments.

The rapid popularization of digital technologies has led businesses to develop new business models that are becoming increasingly reliant on data, regardless of the industry. For instance, software platforms such as Google and Facebook utilize algorithms to analyze their users' search content and browsing behaviors to design software functions or push ads based on user preference. E-commerce platforms also analyze purchase records to recommend products that may interest consumers. In addition to commercial uses, data has been used in different fields for several other purposes. Medical research institutes use massive amounts of medical history data and physiological imagery to develop medical technology that are more effective and accurate. Transportation systems, on the other hand, are able to consolidate pedestrian and vehicle traffic data to provide the public with route options and real-time traffic situations.

While data can increase enterprise revenue and optimize social systems, it can also violate people's personal privacy. As such, many countries have enacted laws to regulate the use of data, the most prominent being Europe's General Data Protection Regulation (GDPR), which mandates that enterprises and organizations may not use personal data without consent. The regulation also guarantees the right to erasure, meaning individuals have the right to request the erasure of their personal data, identifying information, and search history on the Internet. This regulation, undoubtedly, has a direct impact on enterprises that view data as a critical asset. Fortunately, an article in the GDPR states that unidentifiable or de-identified personal data or information shall not be subject to its jurisdiction. Most countries have also enacted laws to this effect.

Although businesses may use data with unidentifiable user information, existing technologies and protection mechanisms make de-identification a challenging task. First of all, the rapidly growing capabilities of current processors, especially quantum computing, which will only keep improving, make it easier to crack existing passwords. Obtaining personal data isn't a difficult task as systems are practically undefended. Even when forgoing password protection and directly deleting key information in personal data, interested parties can still infer the erased information through peripheral data, including age, place of residence, etc., which are not sufficiently protected. The solution to this problem requires both hardware and software to effectively mask critical information. DeCloak Intelligences' hardware chipset and software applications achieve data de-identification, allowing enterprises to expand into European and American markets hassle-free and enabling governments to construct regulatory compliant smart cities.

DeCloak Intelligences, founded in 2020, aims to provide microchip-security level de-identification technology and services for user behavior data. In terms of hardware, DeCloak Intelligences has released a PPU (privacy processing unit) chip which has evolved into a USB format PPU-Dongle and an adhesive type PP-SIM PPU chip based on the core technology of differential privacy. This technology can randomly add numbers to destroy identifiable segments of data while maintaining data integrity to achieve de-identification. To operate, the PPU-Dongle just needs to be inserted into a device's USB port while the PP-SIM is attached to the SIM card of a smartphone or mobile device. Data is transferred using a de-identified format to the back-end, allowing businesses to utilize DeCloak Intelligences' predictive AI data algorithm to perform big data analysis or decode data trends.

DeCloak Intelligences Co-President Dr. Yao-Tung Tsou stated that the PPU chip is not only powerful and capable of quickly removing identifying data, it is also small in size, about the size of a rice grain, which allows it to be easily integrated into various electronic devices. The predictive AI data algorithm can ensure that data remains private while being analyzable, making it mutually beneficial for both enterprises and users.

Currently, DeCloak Intelligences' hardware and software solutions have been adopted by several organizations, including Taiwan's county and municipal governments as well as logistics companies to analyze pedestrian flow data within cities. In addition, plans to market the product overseas and partnership with various foreign companies will inspire even more creative applications.

When DeCloak Intelligences was just founded, TTA provided crucial support by paving the way for the company to take part in multiple projects and attend major exhibitions overseas. The company's products earned the attention of a reporter from tech media EETimes at the CES 2020, resulting in an article spotlighting the company's hardware and software solutions which drew the interest of major international companies. Dr. Yao-Tung mentioned that with the support of TTA, DeCloak Intelligences has been able to continue the optimization of their business model and increase its visibility. In the future, DeCloak Intelligences will strive to engage partners from different fields to expand the scope of their products' applications.

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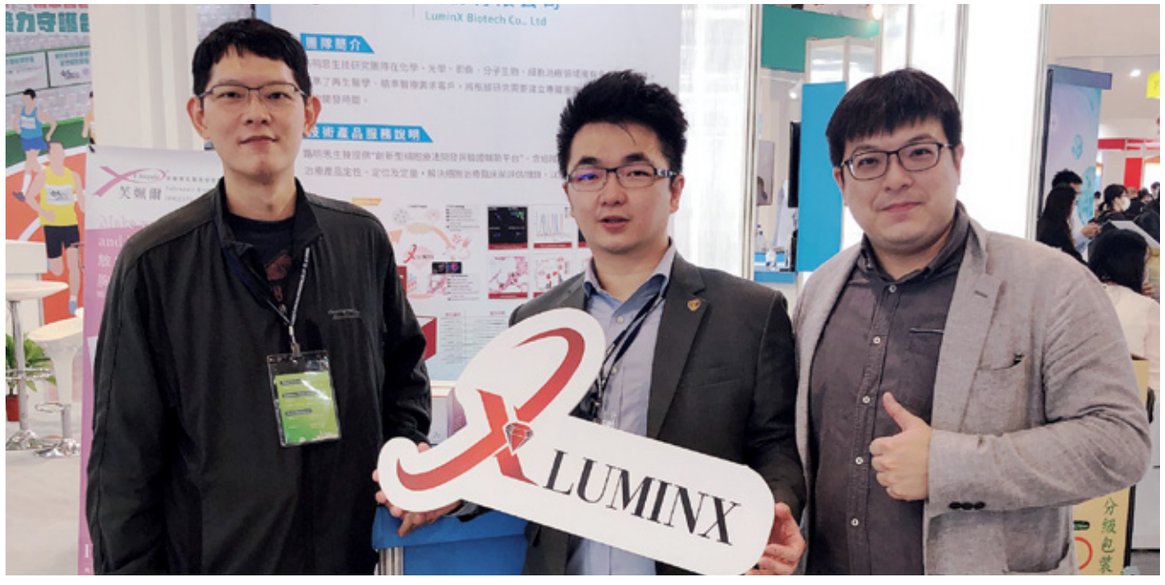

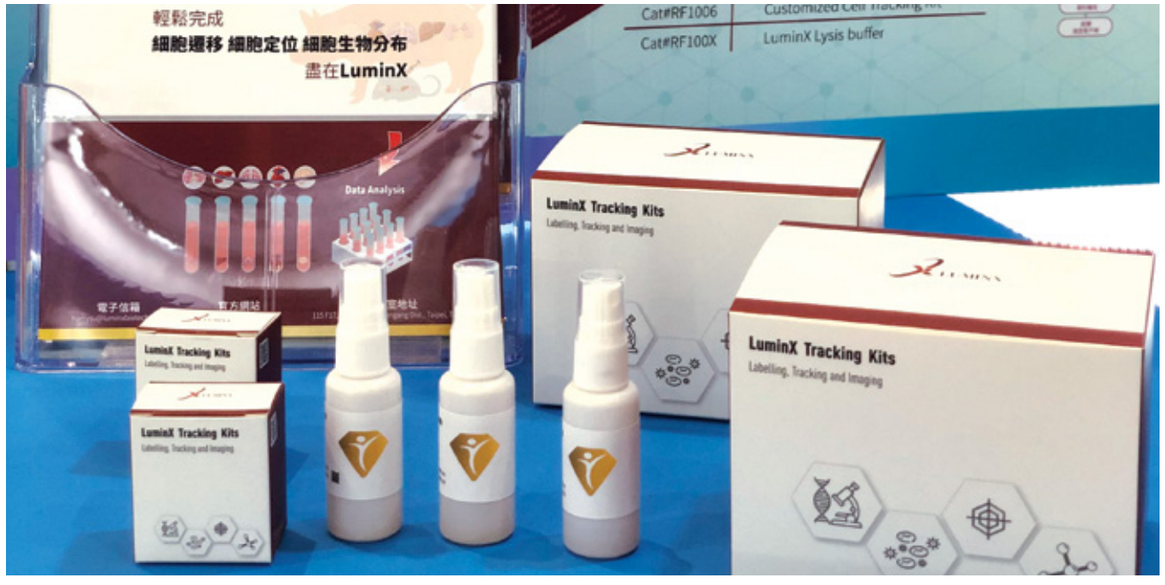

LuminX Biotech

Fluorescent Nanodiamond Marker: A Leap Forward in Cellular Medicine Development

The completion of the human genome sequencing project has opened up new opportunities for drug development. Some diseases that were once difficult to cure can now be treated with targeted drugs. However, targeted drugs are only suitable for patients with specific genes. Furthermore, there are still no suitable drug treatment options available for patients with cancer or other special diseases. This has made cellular medicine a popular global research focus. Despite the fact that many companies are investing in cellular drug development and that cell drug clinical trial designs are largely identical to traditional clinical drugs, the lack of accurate and rapid pre-clinical cellular pharmacokinetic validation had made it impossible to confirm the safety, efficacy, and traceability of developed cell drugs, thus greatly slowing down the development of this new generation of therapeutic methods.

Currently, the development of cell drugs mainly relies on fluorescent markers to track cell flow and efficacy. However, this technology has many problems, including a short fluorescent marking effect, limiting the possibility of extended tracking, background fluorescence interference with accurate localization as well as toxicity of the fluorescent markers, which damages the cells. Because of this, research projects can become highly time consuming and costly. The innovative cell therapy development and validation platform launched by Taiwan-based startup— LuminX Biotech provides a suite of functions after cellular drug injection consisting of in vivo cell GPS localization, in vivo cell biodistribution analysis, imaging and quantitative analysis, and qualitative analysis of the binding polymerase chain reaction. It also provides a cellular drug kinetic and pharmacological analysis platform to address the current lack of pre-clinical cellular pharmacokinetic evaluation in cellular medicine development. This innovative technology has also been presented at the Taiwan Healthcare+ Expo in late 2021 through a partnership with E-DA Hospital.

LuminX CEO Dr. Harry Su pointed out that the technology behind the 『LuminX Cell Therapy Enabling Platform』 which provides cellular therapy pre-clinical development and validation support is based on the nanodiamond marker technology developed by the Academia Sinica in collaboration with National Taiwan University, which was acquired by the company through technology transfer. The company's nanodiamond fluorescent marker can go on for much longer periods of time without any effect on the cells, and works in combination with a backend tracking system to accurately achieve localization and quantification. This technology can help cellular medicine products reach clinical trials by making cell tracking both possible and comprehensively quantifiable.

The company's unique LuminX fluorescent nanodiamond marker has won many awards such as the 17th National Innovation Award in its very first year of operation, the 18th National New Innovation Award in the following year, the 2021 NBRP Demo Day Biomedical New Innovation Award Achievement Exhibition-Industry Pioneer Gold Award, and the 2021 COMPUTEX d&i awards. For two consecutive years, LuminX has also been awarded with the Ministry of Science and Technology's 2020 and 2021 BIO Asia-Taiwan New Innovation Team Participation Grant. This has given the LuminX team the opportunity to participate in startup presentation competitions as well as the chance to collaborate with professionals from around the world.

Success in International Markets — Japan, China, Vietnam

Currently, LuminX is working with over ten academic research institutes, six medical institutes, and five cell therapy companies as it continues to focus on clinical trials. Take wound healing assay as an example; using traditional fluorescence-based imaging technology would mean that projects could take at least two years to complete. Now, by using LuminX's innovative LuminX Cell Therapy Enabling Platform, it only takes two weeks to get results by tracking the flow of cell drugs, which could save at least 50% in costs and 80% in manpower. Besides the platform, the company also provides customized services for molecular biology testing, morphology, cell biology, and experimental animal model testing commissioned to help make cell therapy treatment safer and better.

Harry said that he received a lot of support from the government when he first started the company, namely the encouragement from winning the National Innovation Awards, the funding from Taipei City Government's startup program, residency at TTA in Taipei Arena, accelerator program from IAPS, and the chance to debut its product on the HVC Kyoto 2021. It was during this event that he was interviewed by the Japanese media, which greatly increased the company's visibility. Currently, LuminX has signed MOUs with companies in Japan and China and is actively working with Kyoto University in Japan and the Vietnam Academy of Science and Technology to prepare for its entry into the international market.

In the future, the company will focus on two business models: reagent sales and custom pre-clinical validation services to tap into the trend of global cellular medicine development. LuminX will continue to expand the international market by working with major academic research institutes around the world, while seeking opportunities to collaborate with major clinical trial service providers, contract research organizations, and cell medicine-related companies.

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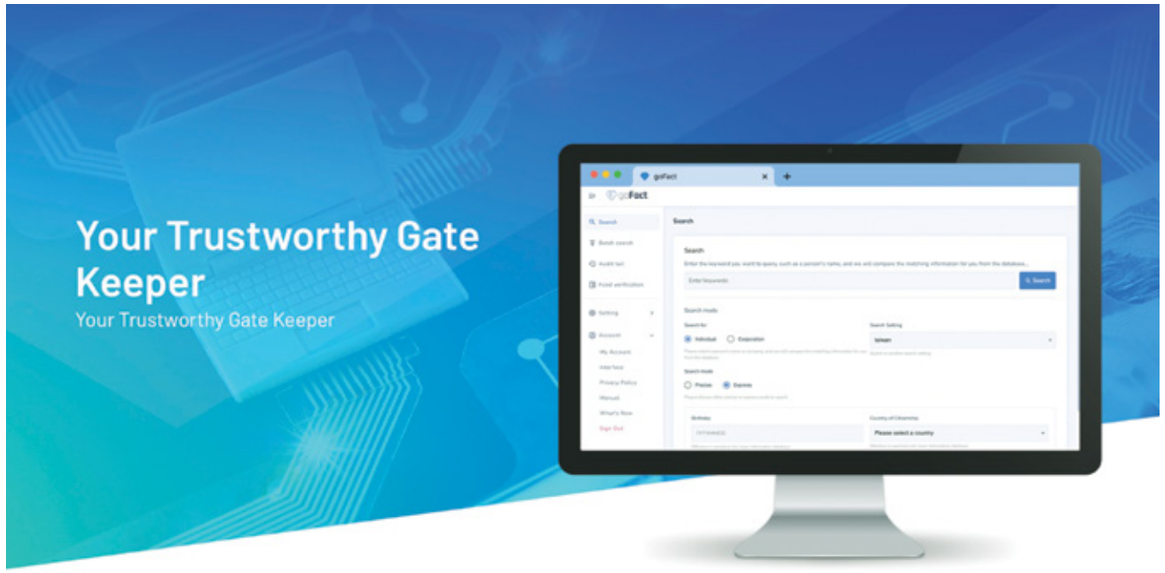

KryptoGO

Redefines Reg Tech with AI-based Blockchain Technology

The emergence of financial technology (FinTech) has encouraged governments around the world to loosen financial regulations which in turn further boosts growth of the technology. As such, technology companies are now able to offer services like mobile payments, robo-advisors, self-service banking, etc. to provide customers with better financial services and promote financial inclusion for all. However, as innovative services are taking the world by storm, offenders have also started abusing new technologies and using them as convenient channels for money laundering and other criminal acts. According to KPMG's 2020 Taiwan Banking Report, the global banking industry spends US$25 billion annually on financial crime prevention and control, most of which goes towards Know Your Customer (KYC) related operations.

With continuously updated global financial laws and increasingly stricter anti-money laundering regulations, financial institutions without proper KYC implementation are at risk of being heavily fined by the authorities. In fact, the New York branch of Taiwan's Mega International Commercial Bank was fined US$180 million in 2020 for failing to comply with anti-money laundering regulations in August 2016. This challenging task has attracted the attention of many technology developers and startups, who are now investing in the development of regulatory technology (RegTech), to assist financial companies to meet the anti-money laundering regulations without exorbitant amounts of time and human resource costs. As winner of five top prizes in the 2020 Taiwan RegTech Challenge (TRC), KryptoGO is a startup that has received considerable attention from the industry.

KryptoGO's Founder and CEO, Kordan Ou said that the biggest compliance challenges in the financial industry in 2020 included overly stringent regulations that are difficult to enforce, insufficient staff trained in reinforcing anti-money laundering, underdeveloped and outdated anti-money laundering financial technology, identical name and last name concurrence in sanction lists matching, and insufficient budget on top of overly strict audits. These challenges have made it very difficult for financial companies to fully comply with the legal requirements and have caused human resource expenditure, at about 70% of the total cost, to become the most expensive aspect of KYC implementation. In response, KryptoGO has developed a proprietary AI-KYC engine to automate the regulatory process and enable the sharing of data between companies, helping the financial industry to quickly identify possible money laundering risks, while reducing operational expenses.

AI Search Engine Quickly Identifies Persons of Interest from Built-in Lists of Sanctioned Individuals

KryptoGO's KYC advanced financial regulatory DD search engine covers the lists of mainstream financial industry sanctions from over 200 countries. The proprietary Chinese natural language processing technology can analyze the digital footprints of each customer in real-time, conduct background research, filter sensitive keywords, emotions, and assess their money laundering risks to effectively reduce alerts for individuals who share the same surname and first name as those on sanctions lists and cuts down on investigation time by up to 80%. For example, KryptoGO can use its AI-powered customized search engine to collate the full range of money laundering risks of each client, then cross-references them with the search results of suspicious targets to easily generate a risk report that can help with money laundering risk assessment. This streamlined process drastically reduces tedious manual auditing tasks since it eliminates the efforts needed to photocopy, authorize, and store manually-generated reports, making anti-money laundering compliance easy and fast. In other words, KryptoGO can help the financial industry swiftly complete risk management, implement legally compliant management, supervise integrated real-virtual capital flow, and meet compliance requirements outlined by the Money Laundering Control Act.

Kordan stated that KryptoGO is led by a team with ICT expertise as well as three certified anti-money laundering (CAMS) specialists with over twenty years of experience in the financial industry. Their contributions allow the company to examine its clients' anti-money laundering processes and analyze potential risks, providing recommendations for improvement. Thanks to its multi-disciplinary team, KryptoGO offers a one-stop risk audit solution that makes the anti-money laundering process both fast and efficient. Moreover, the company can assist the financial industry in accurately grasping risks related to internal and regulatory compliance.

As a four-time serial entrepreneur, Kordan believes that the entrepreneurial environment in Taiwan has improved significantly in the past few years, and that the government is now allocating more funds and offering more comprehensive assistance for entrepreneurs to encourage them to start their own business. However, compared to other countries such as Singapore and the United States, Taiwan still has room for improvement. Regulations, in particular, need to be updated to attract more capital and talents to create a more vibrant startup environment.

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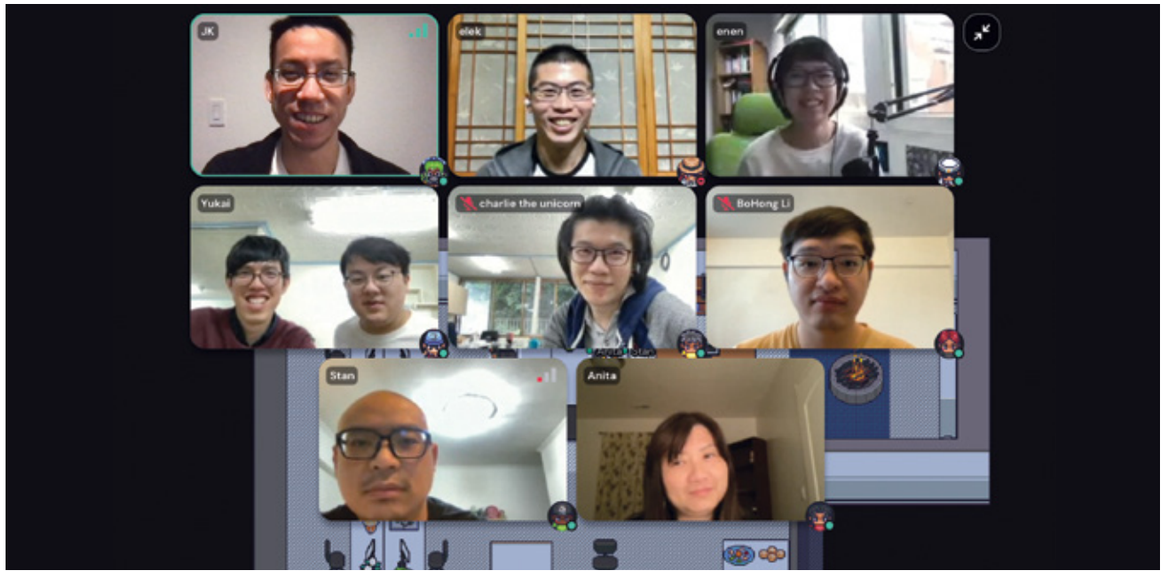
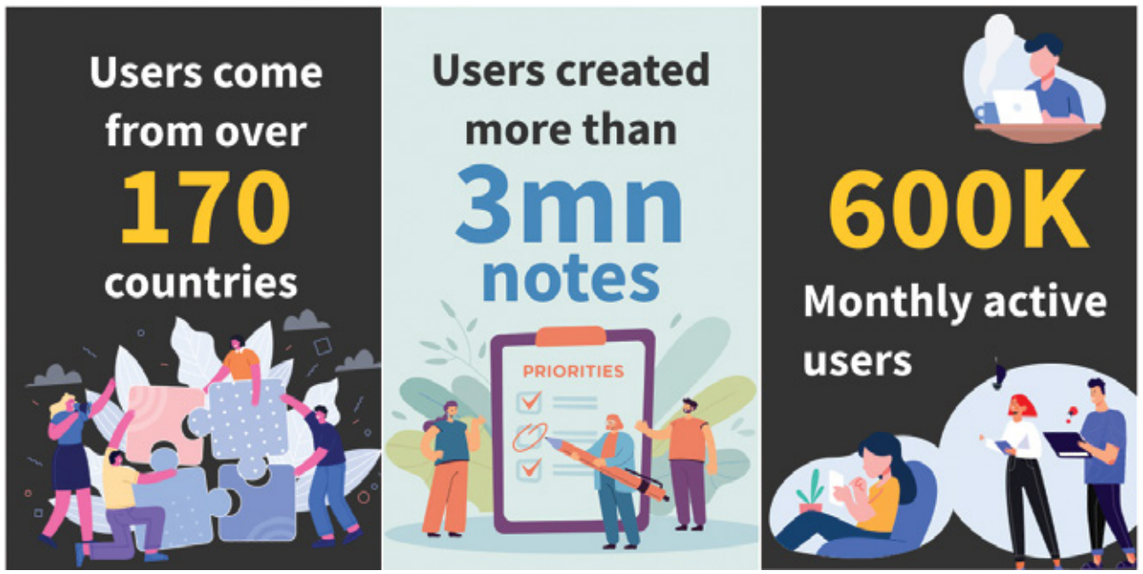


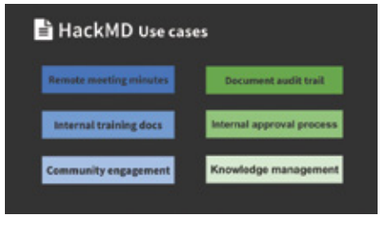


HackMD

Successful Digital Transformation with an Open Collaborative Document Platform

Digital transformation is an essential strategic move for companies to remain competitive in a world full of disruptions. Two things are fundamental to the success of all digital transformation initiatives: digitization and digital optimization. Internal documents and document-based processes, which play vital roles in both, are key factors to the success of a company's digital transformation. Jong-Kai Yang, co-founder and CEO of HackMD, pointed out that document collaboration, management, as well as approval and audit trail are tightly linked to a company's operations and processes; however, these functions are often overlooked in the transformation process.

Looking back at the recent history of internal documents, when Windows first came out in the early 90s, Word, Excel, and other Office tools were quickly adopted by many enterprises. Compared with handwriting or typing methods at the time, these tools enabled users to instantly correct mistakes, and to save files digitally. But at the end of the day, Word is just a typewriter with more features - it still types on A4 paper. More document tools with different features subsequently emerged. Some allow users to send files via email or communications software, among other channels, or to even edit a document in collaboration with other users. The concept of document tools, however, had never been redefined in the digital era, unlike other digital tools. More and more companies now talk about digital transformation and digital optimization; however, documents and document-based processes, the tools and mechanisms that sustain companies' daily operations, are still being neglected and their functions are still limited to just typewriting and printing.



Of course, the current methods seem to work quite well. And if it ain't broke, don't fix it, right? Is it really necessary to redefine and strengthen documents and related processes? Jong-Kai pointed out that there are several pain points users often overlook. Starting with—file format. The format ".docx" is a proprietary format of Microsoft and once a company starts using Word, the company and all of its internal information are locked-in to a single vendor. In addition, Microsoft updates its file format every once in a while, and companies have no other choice but to pay even higher royalties. Moreover, even if a company upgrades to the newest version of Word and all the newer versions are backward compatible, the company still faces issues of documents with legacy formats and inconsistent styling.

The second pain point is information security. A company's internal documents are often stored by employees on their personal or company-issued PCs. This information storage strategy is not only inefficient to manage, but also prone to information security blind spots. Documents, specifically the information contained within, are a company's most valuable assets in the digital era. Many of them must be kept confidential. Yet with the current method, management can only rely on the integrity of each of the company's personnel, which poses high information security risks. Even for less sensitive documents, the trouble of file version naming and the scattered file storage locations discourage sharing between colleagues, placing constraints on knowledge management, let alone maximizing the value of the knowledge.

The third pain point involves process efficiency. A company's daily operations consist of cross-functional and cross-level collaboration on documents. Of which, document signing, approving, and auditing are all important management checkpoints. Mainstream document editing tools don't cater for this. Although there are an increasing number of e-signature tools, the internal sign-off processes of many companies haven't really changed much since the 90s. Digital documents are printed out before physically sent to the other party, who then signs or stamps the documents. The documents are then kept in folders somewhere in the company, never to be seen again. This entire process is delayed if someone is not in the office. Management of these documents is highly inefficient and poses additional risks.

In response to the abovementioned and other pain points of current document management tools, the HackMD team has developed the HackMD document platform. Jong-Kai highlighted that HackMD's most prominent feature is that it enables the entire personnel of a company to access the same file via a single cloud platform. By using a cloud platform, all actions including input, deletion, and amendment, etc. will also be recorded in the cloud. These history records cannot be spoofed or modified. This process is not only much safer than easily forged seals and signatures, but also meets the audit trail requirements of certifications such as ISO or SOC2. At the same time, collaborators and management level personnel can access documents remotely to write, edit, and approve them. The company's internal information assets are no longer scattered and managed on each individual employee's computer. HackMD's solution also allows administrators to grant different task-based permission levels, including document collaboration, approval, or read-only, thus improving process control and reducing information security risks.

The HackMD platform uses Markdown, an open source text file format, so a company's confidential information will no longer be bounded by a proprietary format. Markdown files are compatible on all operating systems including mobile phones and tablets.

HackMD's cloud platform provides a unique tool for companies to master document collaboration and improve their document-based process efficiency. Moreover, its history records provide audit trails, and permission settings reduce information security risks. HackMD is a platform for more streamlined operations and unlocks more value in information. The Sandia National Laboratories in the U.S. and the National Applied Research Laboratories in Taiwan have adopted HackMD into their operations. Jong-Kai added that the support from TTA has been vital for the product being so well received by these two major research institutes. HackMD is also backed by Vitalik Buterin (the creator of Ethereum, one of the major cryptocurrencies) and has gained a strong foothold. In the future, HackMD will continue to strengthen its technology, expand its business model, and promote its products throughout the world.

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TAIWAN TECH ARENA Event Summary

TTA Talk

TTA hosted its first ever TTA Talk at Taiwan Innotech Expo (TIE) on October 16, 2021. We were honored to have Minister Wu Tsung-Tsong, Ministry of Science and Technology join the event and deliver his welcome address. For the talks, we were able to invite two inspirational speakers including Appier's Chief ML Scientist, Shou-De Lin, to talk about the opportunity of secondment service to industry and co-founder of iCHEF, Ken Chen, who shared his view on the turning points on the path of entrepreneurship.

TTA Entrepreneurial Investor Salon #7

TTA hosted the Entrepreneurial Investor Salon #7 - Next Wave in Sports Tech on October 28 at 7pm at TTA 3F staircase. It was an in-person event and was live streamed on TTA Facebook Page and YouTube. Moderated by Tony Tsou, an up-and-coming Sports Podcaster, 3 special guests including TTA Black Card member - Jameson Hsu from Kinetik, Mark Su from MeetAgile, and Ruru C.L. Lin from Jingletek shared their experience and their insights on the development of sports tech in Taiwan.

flyingVest Ventures Demo Day 2021

flyingVest Ventures presented its first Demo Day of 2021 on October 13. Held virtually, the event featured 4 startups - Miraque J, MarkerX, Jacker Cleaning, and MeetAgile presenting their milestones and the roadmap moving forward. Distinguished guests included Kris Peng, President of UMC Capital and David Kao, President of Fungly Capital.

500 Global Accelerator Taiwan with TTA Demo Day

500 Global Accelerator Taiwan hosted its first Demo Day featuring 20 cutting-edge companies which were selected from over 180+ international applicants to participate in 500 Global's 8-week, full-scale global accelerator program. The interactive event was held on October 22 with a livestream of founders' presentations, an exclusive investor virtual space to connect with the startups and fellow investors, and more.

TTA International Forum @Meet Taipei

This year's Meet Taipei was held on November 18 - 20 at Nangang Exhibition Hall 2. In the afternoon of Nov 18 on Tomorrow Stage, TTA hosted an international forum on "The Rise of Southern Taiwan: Driving Innovation and Entrepreneurship in Taiwan" where TTA Deputy CEO, Johnny Fu, introduced the emerging entrepreneurial atmosphere in southern Taiwan. And joining online from Israel, Eli David, CEO of StartupBlink delivered his keynote on "The Importance of the Growth of Taiwan's Southern Startup Ecosystems".

With Dr. Hank Huang, Managing Director of IAPS, as the moderator of panel discussion, NCKU Startup Accelerator Director, Ming-Long Yeh and BigGo's Founder & CEO, Kevin Yen joined in the discussion on how startups in southern Taiwan could develop to go global.

Audi Innovation Award 2021 OpenHaus

Audi Innovation Award (AIA) OpenHaus was held at TTA on December 1. Since 2018, the Audi Innovation Award has sought to empower startups with innovative solutions that impact our daily lives and shape the future of smart mobility. TTA and Audi Taiwan have been actively boosting the Taiwan startup ecosystem by organizing startup community events. This year, 15 startups along with many investors & enterprises joined the open house to discuss the future of AI, AR/VR/MR, and Sustainability.

TTA Tech Goodies Unboxing #06

To help our startups promote their products/services and increase sales, TTA has launched a series of monthly "TTA Tech Goodies Unboxing" livestream VDOs where we invite B2C startups to come on the air and introduce their products/services as well as offer special discounts for the livestream audience.

For the Unboxing #06 on December 3, TTA welcomed Sam Lee, co-founder of USPACE to promote their parking space sharing platform and Allen Ye, founder and CEO of PackAge+, a startup which sets out to solve problems arising from single-use packaging.

TTA x CES 2022 Bootcamp

TTA hosted a 3-day online-offline hybrid bootcamp to further enable the startups heading to CES 2022 to achieve maximum results at the exhibition. The bootcamp was held on December 6 - 8. And we were privileged to have top notch mentors from 500 Global, 10X Innovation Lab, and Startup Junkie host 6 webinar sessions from different corners of the globe; while the in-person workshop was led by 7 mentors from Google and our partner accelerators.

TTA South x 2021 Meet Greater South

TTA shone brightly at the 2021 Meet Greater South x 5G AIoT Expo which took place on December 10 - 11 at the Kaohsiung Exhibition Center. Besides leading 23 startups in the fields of Smart Technology, Precision Medicine, and Clean & Circular Tech to exhibit at the expo, TTA also hosted an international forum to discuss the development of startup ecosystems in Southern Taiwan and how TTA can bridge the resources between Northern and Southern Taiwan.

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EMPOWERING GLOBAL TECH STARTUPS