Taiwan Tech Arena (TTA) is a flagship startup ecosystem building program launched by the National Science and Technology Council. Through integration of various resources, TTA strives to transform 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.

ISSN 2663-9076
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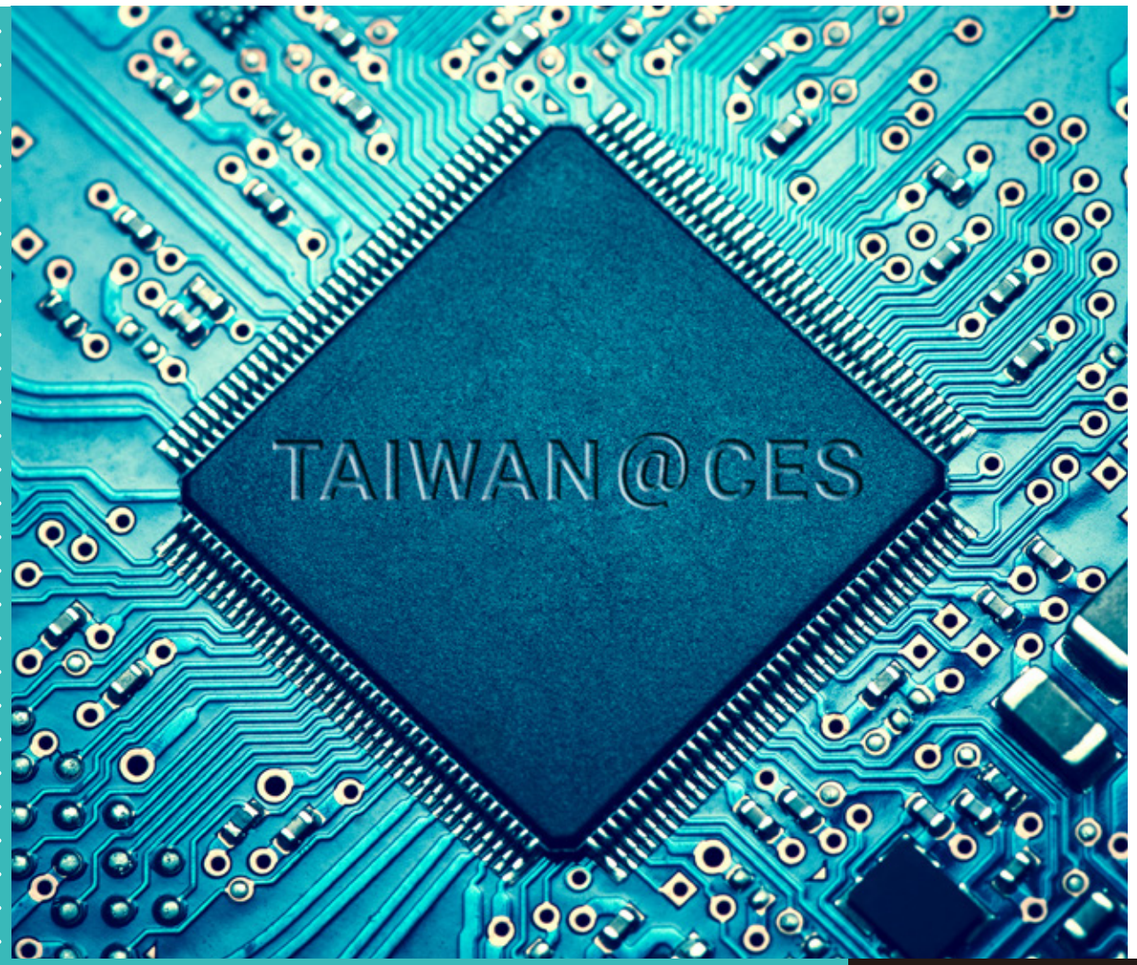
TAiWAN TECH ARENA

TTA



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Co-Innovating the Future: Synergizing Taiwan's Innovation Ecosystem and Global Ventures.

Embark on a journey through 'Co-Innovating the Future,' where Taiwan's innovation ecosystem converges with global ventures, illuminating the synergy shaping tomorrow's technological landscape.

Advanced Process Technologies Driving End-Application Innovation and Market Competition

Powering Tomorrow's Tech: A Deep Dive into Advanced Process Technologies and Market Dynamics

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

Marching to CES 2024, Taiwan's startups are poised and ready!

The Consumer Electronics Show (CES) in the USA is one of the most anticipated global tech events each year, attracting industry elites, professionals, and mainstream media from around the world. Since its inception in 2018, TTA has been actively promoting Taiwanese tech startups on the international stage by participating in global events like CES, providing them with a platform to showcase their innovations and connect to global business opportunities. In 2024, the National Science and Technology Council (NSTC), along with various ministries, will lead internationally competitive Taiwanese startup teams to this prestigious event for the seventh consecutive year.

This year, over 200 teams registered for CES 2024, with 96 passing the rigorous selection process, highlighting the fierce competition with an acceptance rate of less than 50%! The participating teams cover six major fields: AI/Robotics, Digital Health, Smart Home, Smart Cities & Sustainability, Sport Tech, and Vehicle Tech & Advanced Mobility. We anticipate that all teams will embody the spirit of 'Think Big & Go Global' to showcase the rich diversity of Taiwan's tech startups and open more international collaboration opportunities.

In this issue, we are honored to interview the new Executive Director of the Canadian Office in Taipei, Mr. Jim Nickel who look back on his first year in Taiwan, shares his observations on Taiwan's startup environment and his views on future collaboration opportunities in tech innovation between Canada and Taiwan. Canadian startups are highly active, such as Blumind, an AI-based semiconductor chip development startup, which won the 2023 InnoVEX Pitch Contest, serving as an inspiration for Taiwanese startups.

TTA celebrates its fifth anniversary this year, continuing as a steadfast ally in Taiwan's startup ecosystem, and expanding its network of startup connections. This issue will introduce two Black Card members, Jeffrey Chu and Lyle Fong, both passionate entrepreneurs actively linking TTA with the local and international startup ecosystem and who recognize AI innovation as a future opportunity. Additionally, this edition will feature seven outstanding startups from various fields, each a rising star in their respective domains with promising growth potential.

With the robust support of the NSTC and its commitment to promoting innovation and entrepreneurship, optimizing the entrepreneurial environment, cultivating diverse talent, and encouraging the entrepreneurial spirit among youth, TTA will continue to nurture and drive the growth of Taiwan's startup ecosystem."

Andrea Hsu

Andrea Hsu

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

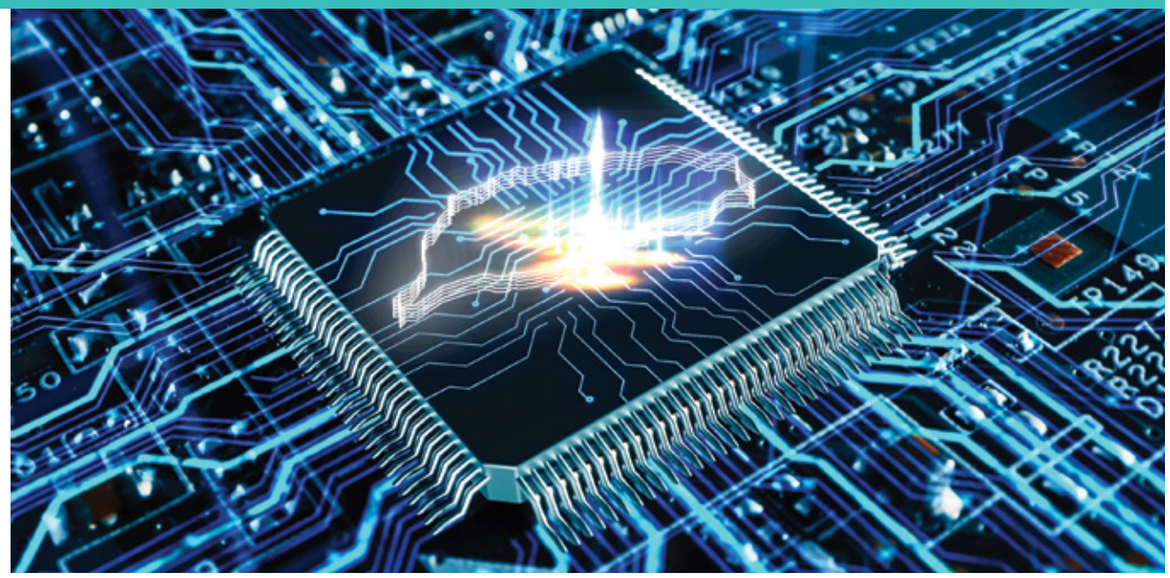
CONTENT

DEC 2023 13

Advanced Process Technologies Driving End-Application Innovation and Market Competition

Amid global economic uncertainty, the semiconductor market's resilience, fueled by innovations in high-end electronics and automotive semiconductors, foretells a compelling long-term growth trajectory.

IEK Consulting
Hui-Hsiu Huang



Worldwide Shipment of Electronic Devices Grows 3.4% in 2023

According to Gartner's statistics in October 2023, the worldwide shipment of electronic devices is expected to total 26.39 billion units in 2023, up 3.4% year-on-year. Computing electronic products account for the largest segment, with 10.69 billion units shipped, followed by industrial/military/aerospace/other electronic devices, with 9.68 billion units shipped in 2023.

In terms of annual growth by segment, industrial/military/aerospace/other electronic devices reported the highest growth rate in 2023, reaching 8.9%. The electronic devices for use in industrial, military and aerospace applications are typically high performance and highly reliable. Automotive electronics products posted the second highest growth rate of 7.4%. These electronic products are usually for safety, control and entertainment in cars. The demand for auto electronic products continues to rise as cars become smarter and increasingly electrified. Communications, computing and consumer electronics all show positive growth for the year. In sum, the global market of electronic devices continues to grow in 2023, albeit at a slower rate.

According to Gartner's preliminary statistics, the worldwide shipment of personal computers in the third quarter of 2023 declined 9% year-on-year to approximately 64.3 million units and reached the lowest point of the market for the past two years. That said, the personal computer market is expected to rebound starting in the fourth quarter. Despite the annual decline in PC shipments, it holds a significant share in the electronic device application market. High-end computing electronic products continue to be crafted with the most advanced process technologies for chip manufacturing.

High-end electronic products manufactured on advanced nodes to compete in the market

Computing applications

1. Intel's new Core Ultra Meteor Lake processors using Intel 4 Process Technology

Intel said at Intel Innovation 2023 in September 2023, that it would launch its new Core Ultra processor, formerly code-named Meteor Lake, in December 2023. It will be capable of supporting generative AI (artificial intelligence) on a laptop, without the need to access the computing power of data centers on the cloud.

The Core Ultra Meteor Lake processor is the first processor to be built on Intel 4 process node. It is packaged with Intel's Foveros technology and with NPU (neural processing unit) and Intel Arc Graphics integrated to meet the computing performance requirements of AI personal computers. Core Ultra is not only the first processor using Intel 4 process node, but also the first that Intel has manufactured using EUV (extreme ultraviolet lithography). Compared to Intel's previous generation technology on Intel 7, the footprint of the processor has been reduced by half and the energy consumption performance improved by 20%.

2. Apple's M3, M3 Pro and M3 Max personal computer chips manufactured on 3nm process node

Apple unveiled its state-of-the-art M3, M3 Pro and M3 Max personal computer chips at the end of October 2023. These three chips are created using leading edge 3nm process technology, enabling more transistors to be packaged into a smaller chip to enhance speed and efficiency.

Apple's launch of its M3, M3 Pro and M3 Max speaks volumes of its significant progress and breakthroughs since the release of its M1 series chips for Mac computers.

The M3 series chips come with a new generation of GPUs, offering faster speeds and higher efficiency. They are also equipped with new dynamic caching technology. The M3 is the first chip for Mac featuring new graphic functions such as ray tracing and mesh shading. Rendering speeds are up to 2.5x faster than on the M1 family, performance core and efficiency core of its CPU are 30% and 50% higher, respectively, and the performance of the Neural Engine is 60% better than the M1 series.

3. NVIDIA H100 GPU manufactured on TSMC's 4nm process node

NVIDIA H100 Tensor Core GPU was launched in the first half of 2022 for data centers. Manufactured on TSMC's 4nm process technology, it contains 80 billion transistors to empower AI and HPC (high-performance computing). It comes with the PCIe 5.0 I/O interface and 80GB HBM3 memory.

The H100 GPU is based on the Hopper architecture, which offers significant improvements in performance, energy efficiency and AI support. Additionally, the H100 GPU comes with newly designed computing cores. Unlike the third generation Tensor Core adopted by the A100, the H100 uses the fourth generation Tensor Core, capable of up to six times higher computing speeds.

On a per SM (streaming multiprocessor) basis, the H100 Tensor Cores deliver double the matrix multiply-accumulate (MMA) computational rates than the A100 SM on equivalent data types, and provide 4x the rate of the A100 when using the new FP8 data type.

In terms of AI performance, the H100 GPU Tensor core is equipped with DPX instructions to accelerate dynamic programming to 7x that of the A100 GPU.

The H100 GPU is primarily used for AI model training, inference and other high-performance computing processing purposes in multiple domains, including:

AI: NLP (natural language processing), computer vision and machine learning, etc. HPC (high performance computing): data analytics, scientific computing and financial simulations, etc. Cloud computing: containers and machine learning, etc.

In summary, the H100 GPU is currently Nvidia's most powerful GPU offering a significant step-up in performance, energy efficiency and AI.

Communications applications

1. Qualcomm's Snapdragon 8 Gen 3 manufactured on 4nm process node

In October 2023, Qualcomm launched its new-generation flagship compute platform "Snapdragon 8 Gen 3", manufactured on TSMC's 4nm node. Snapdragon 8 Gen 3 is Qualcomm's first mobile platform designed with generative AI as the focus and has significant improvements in CPU, GPU and AI.

Snapdragon 8 Gen 3's Kryo CPU adopts a 1+5+2 core configuration. A prime core operates at a 3.3GHz clock speed, the five performance cores are as fast as 3.2GHz, and the two efficiency cores operate at up to 2.3GHz. The overall computing performance is approximately 30% higher and the energy efficiency is 20% better than the previous generation.

Snapdragon 8 Gen 3 uses an Adreno 750 GPU yielding a 25% improvement in graphics performance and 25% lower energy consumption compared with the previous generation. Moreover, Snapdragon 8 Gen 3 supports LPDDR5X memory and UFS 4.0 storage enabling faster data transmission.

2. MediaTek is expected to launch its flagship Dimensity chip on 3nm node in 2024

In May 2023, MediaTek launched its new flagship 5G chip "Dimensity 9200+", manufactured on TSMC's second-generation 4nm node. Dimensity 9200+ offers a performance improvement in both CPU and GPU of up to 10%.

Dimensity 9200+ adopts the Armv9 instruction set, along with one large Arm Cortex-X3 performance core at a clock rate of up to 3.35GHz; three Arm Cortex-A715 cores at a clock rate of up to 3.0GHz and four Arm Cortex-A510 efficiency cores at a clock rate of 2.0GHz. In addition, Dimensity 9200+ comes with an 11-core GPU Immortalis-G715 for ray tracing.

A joint announcement by MediaTek and TSMC in September 2023 revealed that MediaTek's first 3nm flagship chip will be manufactured by TSMC. The design has been completed and mass production is scheduled for 2024. Manufactured with TSMC's newest 3nm process, N3, this chip will provide an improvement in both performance and efficiency.

3. Apple iPhone's newest A17 Pro chip manufactured on 3nm process

Apple iPhone15 Pro comes with the A17 Pro chip, the first smartphone chip manufactured on a 3nm process, which is the most advanced semiconductor process today. It boasts higher transistor density, lower energy consumption and greater performance. The adoption of the state-of-the-art 3nm process by A17 Pro indicates a significant breakthrough in smartphone chip technology.

The A17 Pro comes with a six-core CPU, a six-core GPU and a 16-core Neural Engine. Equipped with 19 billion transistors, the A17 Pro's CPU is 10% faster and its GPU is 20% quicker than its predecessor the A16. The A17 Pro provides a smoother experience on iPhone 15 Pro for gaming and image editing applications.

One of the A17 Pro's greatest features is its support for ray tracing, a state-of-the-art graphics rendering technique for vivid images. The A17 Pro's GPU significantly enhances the graphics quality with the ray tracing feature activated. This empowers better image presentation for games and image creation on a smartphone.

Automotive applications

1. NXP's S32 series as the next generation automotive processors manufactured on 5nm process

In June 2023, NXP launched its S32 series processors, its next generation automotive processors manufactured on TSMC's 5nm process. This series boasts higher performance, lower energy consumption and greater security to meet the demand for increasingly complex auto applications.

Many customers including Continental, Leapmotor and Applied EV have adopted NXP's S32 as the next generation automotive processors for development. New car models equipped with this series of processors will be launched on the market within the next 18 to 24 months.

NXP chose to create its next generation of automotive processors on 5nm because compared to the previous generation on 16nm and above, the 5nm process provides higher transistor density. A larger number of transistors integrated into a single chip yields improved performance and energy efficiency.

Meanwhile, NXP indicated that linewidth reduction is likely to be a sustained trend for automotive chips in the pursuit of better performance and energy efficiency. As cars are increasingly smarter and more electrified, auto chips will need to process and compute more and more data in real time and using less power.

III. The global semiconductor market will grow at a CAGR of 5% in 2022-2027

According to Gartner's forecast in October 2023, the global semiconductor market is expected to be US$534.5 billion in 2023, down 10.9% from 2022. Communications applications remains the largest segment with a market size of US$154.6 billion, accounting for 28.9%. Computing applications is the second largest segment with a market size of US$14.2 billion, accounting for 26.6% of the total.

The automotive semiconductors market size is US$78.6 billion, accounting for 14.7% of the total. It is the only segment in the semiconductor industry that enjoyed double-digit growth in 2023. The automotive semiconductor market is forecast to grow at a CAGR of 12.7% in 2022-2027, higher than the 5% CAGR of the overall market. This shows the strong growth momentum of the automotive semiconductor market going forward.

IEKView

The worldwide shipment of electronic products continued to grow in 2023 but at a slower pace, primarily due to global economic uncertainty, inflation and the resulting weakness in end-market demand.

Despite the weak demand, the leading players are still creating chips manufactured with the most advanced process technologies for high-end electronic products offering both enhanced product performance and improved energy efficiency, and to obtain competitive advantages in the different verticals in the marketplace. In the HPC and communications segments, Intel, Apple, Nvidia, Qualcomm and MediaTek are launching chips manufactured on 4nm or even 3nm nodes to meet the market demand. These leading-edge processes enable chips to achieve higher computing power and lower energy consumption and to provide a better experience for users.

In the automotive semiconductors segment, NXP and Tesla have launched automotive processors manufactured on advanced nodes to satisfy the need for increasingly complex automotive applications. These automotive processors on advanced nodes not only boast faster processing speeds and lower power consumption, but also help to provide safer and more sophisticated functions for vehicles. The automotive semiconductors market shows a strong momentum going forward. As cars are fitted with increasingly advanced control systems, the demand for automotive semiconductors is poised for continuous growth.

In general, the worldwide semiconductor market maintained its growth in 2023 despite adverse factors such as the global economic recession. As the market of high-end electronic products and automotive semiconductors continues to grow, the global semiconductor market can still anticipate a long-term growth trend.

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Bridging Excellence: Canada and Taiwan's Partnership Can Provide Startups a Springboard to Worldwide Success.

After his first year as the Executive Director of the Canadian Office in Taipei, Jim Nickel reflects on a busy and fruitful year of strengthening existing ties and establishing new connections between Canada and Taiwan.

DIGITIMES Asia, Taipei
Judy Lin

Canada and Taiwan have a history of fruitful collaboration in technology and innovation, with partnerships spanning several decades. Jim Nickel, the Executive Director of the Canadian Office in Taipei, has had a successful first year in his Taiwan mission and expects synergies in the bilateral collaboration to facilitate startup success in the coming years.

Executive Director Nickel also pointed out that Canada and Taiwan are fully complementary partners, and his office aims to strengthen that bond to create even greater value.

"Our idea is to bring together Canada's cutting-edge research and Taiwan's manufacturing prowess in a way that we can work together to add value and perhaps gain access to third markets," said Executive Director Nickel. "As the Taiwanese market is a certain size, but maybe not big enough - you need international markets. Canada's kind of in the same way; we have a large country but a very small population, so we can't rely on our domestic market either."

Taiwan has been chosen as one of the eight key economies by Canada for its Science, Technology and Innovation (STI) partnerships. Canada's National Research Council (NRC) led 40 researchers to Taiwan to discuss projects in areas of AI, green buildings, and life sciences. Taiwan and Canada also signed MOUs to collaborate on AI policies and the exchange of young researchers between Canada and Taiwan.

Canadian technology has helped build iconic structures like Taipei 101 and the Taipei Metro system years ago. Major infrastructure projects continue to showcase Canada's engineering expertise today. For example, Taiwan's offshore wind industry leverages Canadian companies' project development capabilities, with Northland Power holding a vital role in the country's largest offshore wind project.

"But Canada's collaboration with Taiwan does not stop at the bilateral level," said Executive Director Nickel. "Canada, as a member of the supranational R&D program called the Eureka Globalstars, is bringing Taiwan in as a partner to commercialize innovative R&D together."

On November 15, 2023, a call for proposals was launched under Globalstars, with sectors including semiconductor and photonics, digital health and biotechnology, telecommunication (5G/6G), advanced manufacturing, mobility, and circular economy, in many of which Taiwan has demonstrated its strength. Executive Director Nickel said that Canada's NRC will work with Taiwan's Industrial Technology Research Institute (ITRI) to implement joint R&D in the coming months.

Strengthening the Ties Between Canada and Taiwan's Tech Ecosystems

Taiwan Tech Arena (TTA) has been a key partner to the Canadian Tech Accelerator (CTA) and the Canadian Trade Office in Taipei (CTOT), providing support for Canadian startups that come to Taiwan in the CTA cohorts every year since 2021. This collaboration holds significance not only for TTA but also for the National Science and Technology Council, which has high expectations for future opportunities and synergies between the Canadian and Taiwanese startup ecosystems.

Annually, the Canadian Technology Accelerators (CTA) in Taipei selects high-tech startups from Canada interested in participating in the Taiwan program through two cohorts, held in spring and autumn. Themes such as sustainability, life sciences, and artificial intelligence have been explored. In 2023, two cohorts attracted over 60 applicants, with 28 selected. The upcoming 2024 Spring cohort will emphasize AI, while the Autumn cohort will maintain its focus on life sciences.

Executive Director Nickel highlights a positive reception and increasing enthusiasm in the Canadian innovation community and the startup ecosystem to actively engage with and participate in the Taiwan ecosystem.

With shared political values around democracy and transparency, coupled with complementary economic strengths, the outlook appears optimistic for Canada and Taiwan to build the industries of the future hand-in-hand via co-innovation. Evolving startup partnerships and intensifying corporate linkages also bode well in energizing two-way flows of capital, ideas, and talent.

The prospect of enhancing startup collaborations between the Canadian Technology Accelerator (CTA) and Taiwan Tech Arena (TTA) holds promise. Executive Director Nickel has expressed full support for this initiative. This involves not only facilitating the entry of Canadian startups into Taiwan but also establishing connections for Taiwanese startups in Canada.

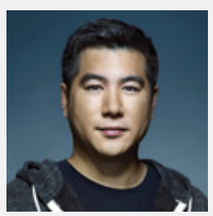
Taiwan's growing startup ecosystem could benefit from testing concepts and accessing export markets via Canadian cities. Similarly, Canadian innovators stand to gain from Taiwan's manufacturing base and hardware capabilities.

Executive Director Nickel advises Taiwanese entrepreneurs to take advantage of what Canada has to offer. As Canada has 15 Free Trade Agreements covering 51 markets, it can provide a gateway to the North American market (including the US and Mexico), the EU, and the Asia-Pacific regions. "By partnering up with Canada or setting up a presence in Canada, Taiwanese companies will have full access to all those markets."

Canada offers many opportunities and programs specifically designed for startups, and Executive Director Nickel said CTOT would be happy to help facilitate the connection for Taiwanese startups interested in venturing out to Canada.

Cultivating Innovation and Connections: Jeffrey Chu's Vision for Taiwan's Startup Ecosystem

How strategic connections between startups and industry leaders could define the next chapter in Taiwan's startup saga.



Jeffrey Chu

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Jeffrey Chu, a Managing Director at BRV Capital Management (BRV) and a distinguished member of Taiwan Tech Arena's (TTA) illustrious Black Card program, stands as an inspirational figure in the realm of Taiwan's burgeoning startup ecosystem. In this narrative, we embark on a captivating journey through Jeff's insightful experiences and his visionary recommendations that could help Taiwan evolve into a global innovation hub.

In his role as the steward of BRV, a tech-focused growth equity arm of BlueRun Ventures, Jeffrey highlights the company's journey. Established in 1998, BlueRun Ventures has identified and led a number of iconic technology investments as the first institutional investor, including PayPal (PYPL), Waze (GOOG), Coupa (COUP), Kabbage (AMEX), Topsy (AAPL), and Chomp (AAPL). BRV Capital in parallel focuses on technology-powered growth opportunities in Asia, and its current select investments include Ecopro Materials (leading EV battery component technology provider in Korea), LINE MAN Wongnai (top O2O platform in Thailand), and Silicon Box (advanced semi packaging fab in Singapore).

Jeffrey leads BRV's US and Taiwan effort, and focuses on the Mobility growth sector which includes EV, Semiconductor and AI. BRV's global presence extends from the United States to Japan, Korea, Hong Kong, UK, and now Taiwan. He plans on returning to Taiwan in November, contemplating the possibility of establishing an office in the country due to Taiwan's unique position as part of the global supply chain.

AI opens up opportunities for Taiwan

Jeffrey notes that AI, as a transformative force, is deeply intertwined with semiconductor technology. While Nvidia might appear to be an unassailable titan, the world of AI has myriad dimensions. It's not confined solely to data centers; it extends into the burgeoning field of edge computing.

Generative AI, voice assistants like Amazon Alexa, smartwatches, cars, and smartphones are all essential elements in this unfolding narrative. He believes this is the golden opportunity for Taiwan.

It is within this dynamic context that Jeffrey identifies a "blue ocean market." In his view, this market unfurls opportunities that could open new doors for countless companies. Taiwan's deep-rooted history as a manufacturing hub for consumer electronics

"A crucial component of Taiwan's ascent in the startup ecosystem is collaboration with European and American startups."

components and modules provides a fertile ground for these opportunities to take root and flourish.

Jeffrey categorizes the technology industry under the intriguing label of "Mobility." The evolution he outlines is compelling. The first generation witnessed the transition from feature phones to the era of smartphones. In the second generation, the scope expands exponentially, encapsulating not just smartphones, but also electric vehicles, two-wheeled electric scooters exemplified by Gogoro, self-driving technology, and more.

EV and semiconductor

When contemplating the international expansion of Taiwanese startups, Jeffrey identifies semiconductor and EV-related areas as prime domains for growth. While the development of Taiwan's electric vehicle ecosystem under the MIH initiative is still in its early stages, the ambitious intent is unmistakable.

Taiwan's push into the EV landscape creates new opportunities for collaboration, spanning diverse aspects such as charging infrastructure, electric vehicle motors, automotive semiconductors, and materials like silicon carbide. This is a frontier where Taiwan's established strengths in manufacturing can create a significant impact on global markets.

Empowering businesses is another focal point for Jeffrey. In the semiconductor field, he points to a remarkable example – an AI company in San Diego offering low-power solutions for security cameras. Taiwan, home to numerous companies providing security camera hardware, can potentially integrate this technology to offer comprehensive AI-based security solutions.

A crucial component of Taiwan's ascent in the startup ecosystem is collaboration with European and American startups. However, this requires meticulous planning, grounded in strategic objectives. Jeffrey acknowledges that for some companies, the commitment to travel to Taiwan for such collaborations may depend on the scale and impact of the investment.

The creation of valuable connections between different facets of the tech world presents a unique challenge. Jeffrey recognizes that stitching and linking these connections is perhaps

the most intriguing aspect of the venture. The global landscape is shifting, with traditional supply chains giving way to novel value chains. This transformation is particularly evident in the semiconductor sector, where new relationships are being forged.

Taiwanese companies are responding to this dynamic environment by positioning themselves to seize opportunities in the EV and new semiconductor domains. These enterprises are evolving to keep pace with the ever-changing tech landscape, and Jeffrey is excited to play a role in this evolution.

Connecting Taiwan Tech Industry Players With Startups

Taiwan possesses an entire industry with boundless potential. To realize this potential fully, Jeffrey emphasizes the need to interconnect all established tech industry players in Taiwan with the startup ecosystem.

The knowledge, experience, and familiarity with international markets that these corporate giants bring to the table make them invaluable assets for startups. Taiwan's information and communication technology ecosystem is indeed distinctive, with its unique mix of resources. To this end, Jeffrey poses a question that beckons innovation: How can we establish meaningful connections between startups and industry leaders like Delta Electronics, Wistron, and Lite-on?

While acknowledging that this may not be an easy task, he sees an opportunity. These corporations are essentially in their own backyard, and the creation of mechanisms to facilitate the exchange of knowledge, resources, and experiences between established industry players and emerging startups would be a significant boon.

Amidst these reflections, Jeffrey Chu's appreciation for the investments made in Taiwanese startups becomes apparent. He echoes the sentiment that a successful partnership in venture capital is not just about providing financial backing; it's also about nurturing and aiding the growth of entrepreneurs and their projects. It's a two-way street, where the investor benefits just as much as the startup. The ideal outcome, as Chu expresses with enthusiasm, is helping companies combine forces to offer holistic solutions to global markets.

Unlocking Entrepreneurial Wisdom and Emerging Trends with Lyle Fong

Insights from Lyle Fong: Spotlight on Entrepreneurial Resilience, Angel Investing, and Shaping the Future of Taiwan's Startup Scene.

Lyle Fong

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In the dynamic world of entrepreneurship, few individuals have journeyed as extensively and successfully as Lyle Fong. Born and raised in the California Bay Area, Lyle's entrepreneurial spirit was ignited at a young age, ultimately leading him to Taiwan, where he's become an esteemed member of the Taipei Tech Arena (TTA) community. In an exclusive interview, Lyle shares his entrepreneurial odyssey, insights into venture capital, and thoughts on Taiwan's burgeoning startup ecosystem.

From Berkeley to the Startup World

Lyle's path to entrepreneurship began when he and Patrick Lee, another Black Card member of TTA, embarked on their first venture during their time at the University of California, Berkeley. Their initial endeavor aimed to create computers tailored for students and hobbyists. Despite not yielding significant profits, Lyle's parents encouraged him to pursue this passion, granting him the opportunity to defer his studies and delve further into entrepreneurship. This pivotal moment set the stage for a lifetime of innovation and risk-taking.

His journey continued with the launch of Gamer Stocking, a pioneering gaming website that, at the time, stood as the largest in its category. However, this venture faced its share of challenges, ultimately concluding without the desired success. Undaunted, Lyle transitioned to his next venture, Lithium, a B2B SaaS company specializing in community software. He bootstrapped Lithium for the first six years, nurturing it to $10 million in Annual Recurring Revenue (ARR). Subsequent funding rounds saw investments totaling over $200 million, catapulting Lithium's ARR to $100 million. Eventually, the company was successfully sold after 12-13 years of dedicated effort.

Venturing into New Territories

Following his tenure at Lithium, Lyle embarked on a new adventure alongside Patrick Lee, co-founding Hobo Labs, a gaming company. This venture added diversity to his entrepreneurial portfolio, showcasing his adaptability and willingness to explore new opportunities.

As his journey evolved, Lyle transitioned to the world of venture capital, first as a visiting partner at Y Combinator (YC) and later as part of EQ T Ventures in London. Although he appreciated the experience of working closely with founders, the role came

"the region possesses the necessary ingredients for success: a thriving ecosystem of hardware and technology, a supportive community like TTA, and the potential for breakthroughs in various sectors."

with its own set of challenges, including administrative responsibilities and collaborative decision-making within partnership structures. After three years in venture capital, Lyle found himself at a crossroads, contemplating whether to continue in the investor realm or return to entrepreneurship.

Angel Investing and Exploring New Horizons

Lyle's recent ventures have seen him dive deeper into angel investing and exploring promising startups, including at 886 Studios and Orbit. While he has met numerous intriguing startups in Taiwan, he has yet to make personal investments as an angel in the region. However, his extensive experience and keen eye for potential certainly position him as an invaluable resource for budding entrepreneurs.

Challenges and Adaptation in Taiwan's Startup Landscape

Relocating from Silicon Valley and Europe to Taiwan presented Lyle with a unique set of challenges. He observed cultural differences in entrepreneurship styles, where founders in Taiwan often exhibited humility and understatement compared to the more assertive and self-promotional approach seen in Western startups. Navigating these distinctions required Lyle to put in extra effort to fully uncover the potential of local startups.

Language barriers also posed a hurdle, given Lyle's less-than-fluent Mandarin. Additionally, some of the most promising startups in Taiwan operate in sectors like semiconductors and hardware, which lie outside his expertise. These challenges necessitated ongoing adaptation and the pursuit of software-oriented companies where Lyle could lend his expertise more effectively.

Empowering Taiwan's Startup Ecosystem

Lyle's involvement in the TTA community has been a rewarding experience. He commended TTA's proactive approach in fostering connections, sharing opportunities, and highlighting the achievements of member companies. This sense of community, support, and information-sharing has created a conducive environment for growth and collaboration.

A Vision for the Future

Looking ahead to the next five years, Lyle envisions himself remaining in Taiwan. His personal aspiration is to start a family here, marking a significant life milestone that he has postponed due to his entrepreneurial pursuits.

Professionally, Lyle aims to deepen his involvement with Taiwanese startups, whether through angel investments or potentially returning to venture capital. The direction he chooses will depend on his evolving interests and where he believes he can make the most impact.

Spotting Emerging Trends: The Power of Location

Lyle's unique perspective on emerging trends stems from his experiences at YC and his exposure to diverse startup ecosystems worldwide. He emphasizes the importance of recognizing regions that are on the cusp of becoming flourishing startup hubs. These areas often undergo a transformative process catalyzed by successful startups that inspire others and attract investors.

He highlights the role of regulation as a strategic advantage, citing examples like the European Union's stringent data privacy regulations and open banking initiatives. These localized regulatory environments can drive innovation and give startups an edge over competitors from other regions.

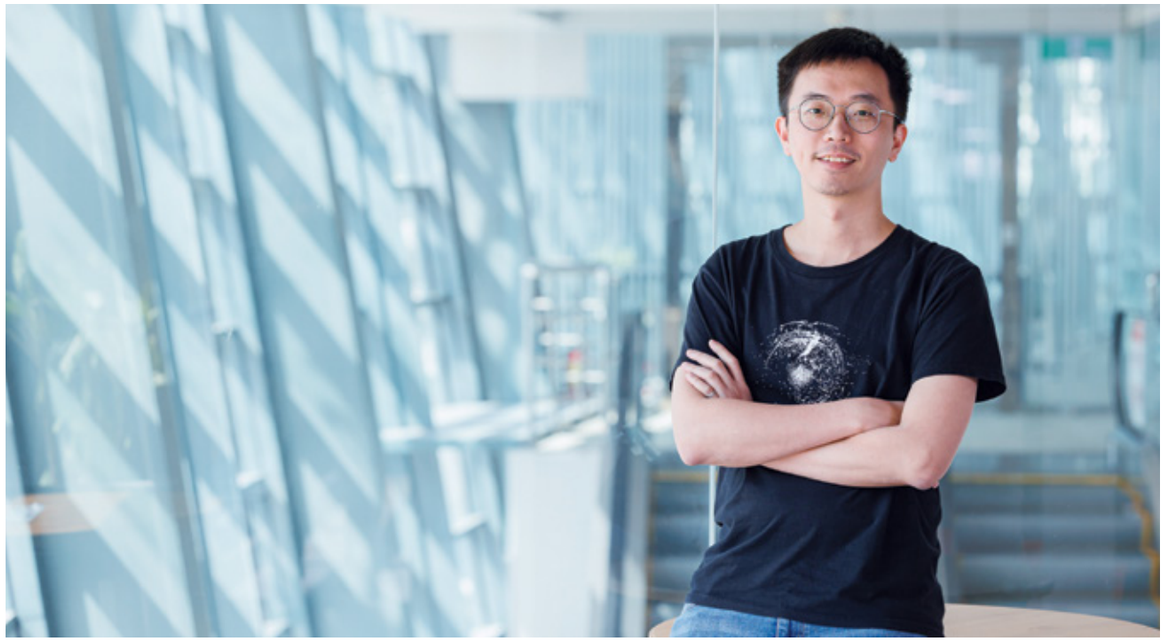
For Taiwan, Lyle envisions the potential for growth in various sectors, including hardware, IoT, software, mobile apps, gaming, and AI. He believes that it only takes a few success stories and cultural shifts to inspire a surge in entrepreneurial activity. Taiwan may be on the brink of a similar transformation, driven by the emergence of globally recognized brands or successful startups that capture the world's attention.

The Road Ahead: Taiwan's Startup Renaissance

While the timeline for Taiwan's significant startup growth remains uncertain, Lyle's optimism is unmistakable. He believes that the region possesses the necessary ingredients for success: a thriving ecosystem of hardware and technology, a supportive community like TTA, and the potential for breakthroughs in various sectors. Taiwan's journey towards becoming a vibrant startup powerhouse may be closer than we think, with Lyle Fong, the serial entrepreneur and visionary, keenly observing the landscape and contributing to its evolution.

STARTUP STORY

Explore the vibrant startup landscape in our featured series, where we delve into the stories of IPO-bound pioneers, Series B trailblazers, accelerator alumni, and collaborative ventures with industry giants.Uncover the strategies and insights driving their scaling success.



DotDot Global

Pandemic Sparks Surge in Takeout, Delivery Platforms: DotDot Global Ventures Overseas after Securing Taiwanese Market

During the three-year pandemic, food businesses had been impacted by decreasing in-person dining and government endemic prevention policies globally. As a result, they have been collaborating with delivery platforms to sustain their survival and increase revenue. Despite increasing diversity in delivery services, people began dining in restaurants or ordering takeout again after the pandemic eased off. To avoid hefty platform fees, food businesses are seeking collaboration with other platforms. They hope that by diversifying delivery channels, they can improve their profit margin and overall revenue.

Bogi Huang, Chief Operating Officer of DotDot Global, pointed out that with the advent of the post-pandemic era, the top two delivery platforms in Taiwan have started offering takeout services. However, businesses still have to pay a fee as high as 18% to 20%, which significantly diminishes the profit of food businesses. These days, we find that businesses are working hard to attract new customers and meet the demands of regular customers. Therefore, apart from maintaining partnerships with delivery platforms, they also indicate additional ordering channels on their menus for regular customers to avoid incurring high platform fees. DotDot Global has launched a smart ordering system that has been integrated with LINE and in conjunction with a complete membership management and payment system. This system has been adopted by chains such as 50 Lan and Old God Kung Food Hot Pot, with more than 10,000 customers.

DotDot Global Maximizes Popularity of LINE

Following the rapid rise of delivery platforms, numerous takeout system solutions for the food industry have emerged. During the pandemic, many cloud-based point of sale (POS) providers introduced online ordering modules to meet a variety of operational demands. Unfortunately, they did not become mainstream systems. Upon in-depth analysis, DotDot Global identifies two major challenges that are hard to overcome. First, online ordering systems are designed for general restaurant operators and are, therefore, less applicable to vastly different food businesses like bubble tea shops, and street vendors. Second, cloud-based POS providers are not familiar with consumers' ordering needs. Most online ordering modules are designed to facilitate business management, causing the interfaces to be less user-friendly. As a result, they struggle to attract consumers to adopt them.

Huang said, "When entering the food market, we decided to launch our own online ordering service through LINE because it is the most popular app in Taiwan." Consumers can order online conveniently by adding the official LINE@ account of the vendor. The platform offers takeout and delivery services, as well as online payment like LINE Pay and JKOPay, making it extremely convenient for both food businesses and consumers. As businesses are facing labor shortages, online payment can eliminate the need to handle cash, make changes, and save businesses from dealing with abandoned orders. Furthermore, DotDot Global has also collaborated with many logistics companies to offer delivery services for food businesses without charging high platform fees.

From the Philippines to the Entire ASEAN Market

DotDot Global offers a one-stop solution for food businesses, covering the POS system of stores, online ordering, in-store WiFi, digital payments, integrated delivery services, food delivery logistics, and marketing strategies for attracting customers. Food businesses can customize these services according to their needs. Take the online ordering system as an example. For stores that have limited operational space and staff, DotDot Global provides cloud-based order-taking and printing machines. Once the equipment receives an order from an online platform, it automatically prints the receipt, and the store can prepare the order on the receipt without changing its workflow. This process is also very easy to learn.

The LINE ordering service introduced by DotDot Global caters to the needs of different types of food businesses. Over the years, it has gradually incorporated various customization settings into its ordering system. Take bubble tea shops as an example. The online ordering system provides options for different sugar and ice levels. For braised food shops, the system offers a discount option of three products for NT$50. After its launch, the LINE ordering service immediately attracted users with all kinds of dining preferences. Furthermore, in 2023, DotDot Global introduced the SoftPOS payment service, adding contactless credit card payment to existing POS machines. Dine-in customers can safely make payments without any physical contact.

Huang pointed out that DotDot Global was founded in 2014 and has since joined two to three accelerator centers. In recent years, there has been noticeable growth in Taiwan's entrepreneurial environment. The number of accelerator centers has significantly increased since ten years ago, offering a more diverse range of services for startups. Whether it is acquiring venture capital, reducing time to market, or transforming creativity into actual products or services, these resources provide tremendous help that can significantly increase the success rate of startups.

DotDot Global recognizes the immense global opportunities in the food delivery and takeout industry. After achieving notable success in the Taiwanese market, DotDot Global plans to expand its operations overseas, starting from the Philippines. DotDot Global is currently conducting proof of concept (POC) verification with Philippine partners in local food courts and has received positive feedback overall. The company plans to expand into other food industries in the future.

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DeepMentor

2As Generative AI Sweeps Across Globe, DeepMentor's DeepExpert Lowers Threshold for Enterprises to Implement Generative AI Projects

Launched in late 2022, ChatGPT showed the world the almighty power of generative AI, thus paving the way for the AI 2.0 revolution. At the heart of generative AI is so-called the large language model (LLM), which is trained on large amounts of data. ChatGPT, for example, is based on either GPT-3 with 175 billion parameters, or GPT-3.5 with 200 billion parameters. Currently, apart from Open AI, Taiwan Web Service's (TWS) Formosa Foundation Model (FFM), and other paid LLMs offered by domestic and foreign companies, there are many more open-source LLMs on the market, such as Hugging Face's BLOOM and Meta's Llama 2. These LLMs are equipped with 7 to 176 billion parameters and can be used legally in commercial environments.

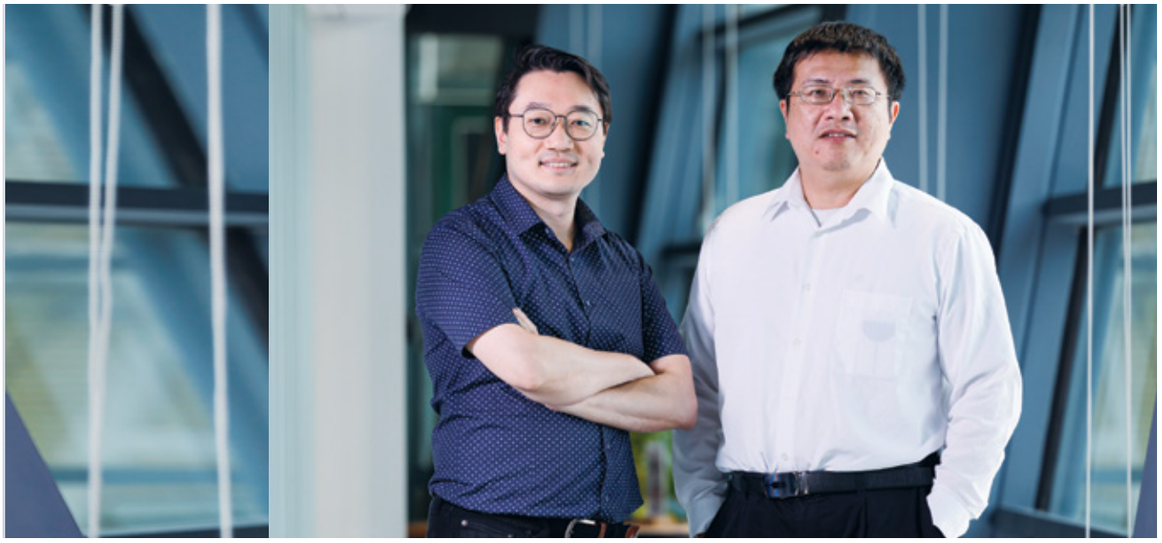
Both commercially licensed and free open-source LLMs, once trained on proprietary data, can be utilized by companies in a variety of ways. For example, LLMs can be used for intelligent customer service, code writing, or improvement of efficiency of corporate information utilization. Such applications have significant potential to increase business productivity and industrial competitiveness. Therefore, numerous providers on the market have claimed to help with the implementation of generative AI. However, only a few companies have invested in such projects, while most are adopting a wait-and-see attitude.

Leo Yang, Chief Marketing Officer of DeepMentor, pointed out that despite the strong demand for generative AI and the urgent need for its early adoption to improve industry competitiveness, companies are still hesitant for three main reasons, i.e., confidentiality and security considerations, high implementation costs, and lack of AI talents. Even if companies are interested in moving forward with generative AI projects, most do not know where to start, as there is a frenzied scramble for AI talent worldwide. In addition, most vendors offer generative AI services on cloud-based platforms, leaving companies concerned about the potential leakage of confidential data. Finally, the cost of training AI models in the cloud can easily reach Hundreds of thousands or even millions of dollars, as most proprietary models need to be trained three to five times to meet customer requirements. These high costs deter many companies from implementing AI projects.

Customized Generative AI Designed for Cloud or On-Premises Use Drastically Reduces Project Costs and Time

To summarize the three factors mentioned above, only a few large companies have enough AI talents and capital to invest tens of millions of dollars at a time in AI servers to satisfactorily perform in-house AI model training and inference. Most medium-sized companies can only look on in envy, not to mention small and medium-sized enterprises with limited budgets and manpower.

To help more enterprises and educational institutes adopt generative AI, DeepMentor launched a comprehensive hardware and software solution for designing generative AI, the Mentor series (basic to advanced versions). Customers can select to conduct different levels of all-parameter LLM training (please see the diagram below) based on hardware on the Mentor Series. DeepMentor helps customers verify the training results versus actual application needs. Take the basic Mentor-100 as an example. Mentor-100 is a product of collaboration with a major industrial computer brand, Axiomtek, which specializes in creating small-scale edge computing AI servers that are quiet, energy-saving, and optimal for office hardware and software architecture. Used in conjunction with Fine-tune Expert, a training software in DeepMentor's pre-installed GAI application software package, DeepExpertTM, as well as the training counseling curriculum, enterprises from different industries and units of different levels can easily adopt applications that cater to their internal needs.



Jack Wu, CEO of DeepMentor, believes that the ability to perform inference using LLMs with 7B or 13B parameters is an important step in advancing AI projects. First, even if medium or large-sized enterprises have sufficient financial resources, it may not be easy to obtain a project budget of more than ten million New Taiwan dollars if there is no supporting data to prove the viability of the project. Whereas, Mentor-100's favorable pricing is very well suited for companies to conduct early-stage proof of concept (POC) on a small scale internally. For schools, research institutes, and small and medium-sized enterprises, LLMs with 7B, 13B, or 33B parameters are more than sufficient for relatively simple usage scenarios or for performing POCs. In these cases, it is not necessary to use an LLM with 176B parameters.

It is worth noting that DeepMentor, as one of the few companies focusing on providing generative AI solutions with a considerable track record, was invited to participate in the testing and promotion of the TAIDE program, a Taiwanese LLM in traditional Chinese announced by the National Science and Technology Council.

Six Usage Scenarios Accelerate Implementation of Generative AI

DeepMentor's DeepExpert solution has two unique features. First, depending on their business needs, customers can choose to use open-source LLMs of different types and parameters, such as Meta's Llama 2, or FFM, an LLM licensed by DeepMentor's partner TWS and pretrained on traditional Chinese corpora. Second, for the hardware architecture, DeepMentor is working exclusively with Phison Electronics in using their NVMe module, which is specifically designed for generative AI training and can overcome the memory capacity limitations of current GPU cards. This allows AI models to be trained with just two NVIDIA RTX A4000-ada GPU cards instead of the more expensive NVIDIA A100/H100 chips. This feature can significantly reduce the overall costs, allowing even small and medium-sized enterprises or academic institutions with limited budgets to take on generative AI projects and see the results of inference in only approximately two weeks.

Leo Yang pointed out that in addition to the DeepExpertTM solution, DeepMentor also offers pre-trained and optimized AI application modules for six common usage scenarios, namely Document Expert, Code Expert, Customer Service Expert, Meeting Expert, Image Expert, and Fine-Tune Expert. Coupled with the self-developed and easy-to-use No Code tool, these modules help enterprises quickly integrate their data to perform training and inference of their proprietary AI models. As a result, to date, they already have government agencies, financial institutions, publicly listed IC design companies, well-established enterprises from traditional industries, and retailers running point of business (POB) testing with DeepMentor to verify DeepExpertTM's outstanding capabilities as a one-stop generative AI implementation solution.

DeepMentor has been working with Taiwan Tech Arena (TTA) since 2018 and has participated in several business matchmaking events, technical presentations, etc. The collaboration has helped raise the company's profile and secure venture capital investment. DeepMentor hopes to maintain a close and cooperative relationship with the TTA in the future to lay a solid foundation for expansion into overseas markets.

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QT Medical

One-minute ECG from the Comfort of Home: QT Medical Makes Cardiac Screening Easy and Convenient

An electrocardiogram (ECG) is a common physiological monitoring device used in medicine. However, conventional ECGs must be operated by medical professionals and are monotonous and time-consuming to use. The PCA 500 developed by QT Medical, a company based in the United States, is a medical-grade 12-lead ECG system that is easy to use and can be operated by a layperson following simple instructions. The entire process takes no more than a minute. The recorded data is sent to the backend via a mobile device and is available to the physician in the cloud for case management and telemonitoring. In terms of accuracy, the device has been approved by the U.S. Food and Drug Administration (FDA), and clinical trials have proven that its performance is on par with high-end resting ECGs in terms of accuracy.

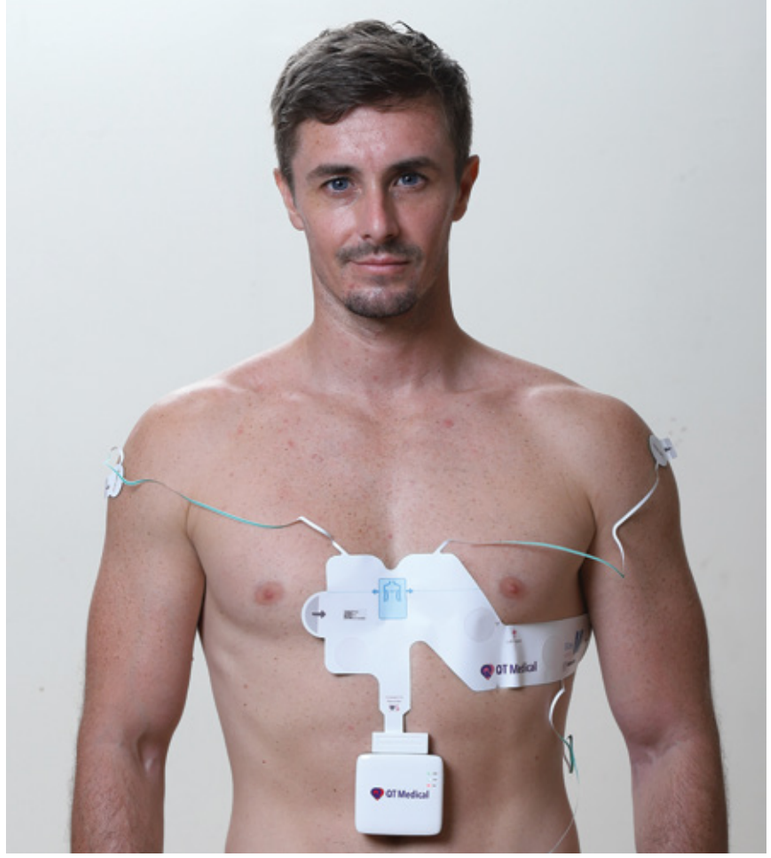
Jackal Chen, senior vice president of QT Medical, pointed out that cardiovascular diseases pose a major threat to human health, with a mortality rate even higher than that of cancer. Fast and affordable, 12-lead ECGs have long been used for preliminary diagnosis and disease classification. According to the medical guidelines set forth by the American Heart Association (AHA), performance of a 12-lead ECG is recommended when an individual experiences chest pain or tightness. Although these common symptoms may seem harmless, they are often the sign of heart disease. A 12-lead ECG provides an initial screening of heart conditions and helps the physician make a diagnosis.

However, as the 12-lead ECG machines are located in hospitals and an ECG screening is usually only part of a complete medical examination, the test must be performed in a hospital. This time-consuming and inconvenient medical procedure often discourages people from being examined and reduces the chances of patients receiving the necessary treatment. In response to this issue, The PCA 500, a medical-grade 12-lead ECG system from QT Medical, was developed specifically to address this problem. According to Jackal Chen, QT Medical's team is committed to making 12-lead ECG devices and services more accessible and user-friendly in small- and medium-sized clinics, community centers, private homes, and even public places. The company wants its product placed similarly to automated external defibrillators (AEDs) commonly found on the street to enable the rapid proliferation of hospital-grade ECG services.

The PCA 500, a medical-grade 12-lead ECG system from QT Medical, stands out for its simplicity. The device consists of a patented one-piece electrode sensor and an ECG recorder, coupled with a mobile app and a cloud-based platform. Users only need to follow the visual instructions and attach the patented ECG electrode sensor to their body. The device then automatically measures the data and sends it wirelessly to the cloud platform via the app. Finally, the data and preliminary interpretation reports are received by the physician for evaluation.

Overall, the medical-grade 12-lead ECG devices from QT Medical are handy, hygienic, efficient, accurate, and of high quality. The intuitive design of the system makes it easy for an average person or patient to use it comfortably and without special training, while achieving the same accuracy as a standard hospital ECG machine. The compact design and patented one-piece disposable strips effectively reduce the risk of disease transmission through direct contact and avoid the risk of misalignment and misdiagnosis associated with the complicated lead wire placement of traditional ECG devices. This ensures convenience and data accuracy, as well as drastically minimizes the time required for the procedure. All ECG data is encrypted and transmitted securely to the HIPAA- and GDPR-compliant cloud-based management system, which enables real-time case management and provides reports in PDF format for easy aggregation and analysis.

Jackal Chen further explained that the development of the product is technically difficult, as the shape of the strips, their position, and the software design need to be fine-tuned in a series of clinical trials to obtain accurate data swiftly. In addition, once completed, the product must undergo rigorous testing and certification to prove its safety and efficacy. Currently, the PCA 500 medical-grade 12-lead ECG system is being used in clinical trials in a variety of different settings and applications. In addition, QT Medical has developed various business models to accommodate the laws and cultures of different countries. In the vast United States, for example, the company works with health facilities to deliver the devices and test strips to patients by mail. Patients operate the device themselves and the data is automatically sent to the cloud-based platform for physicians to analyze. The company is also working with prison authorities in the United States, where the devices are operated by prison staff to address the shortage of medical staff in prisons. As for the Taiwanese market, the device is not only used in hospitals but also in ambulances and telemedicine. Patients can test themselves at home or in a community center and enjoy the benefits of telemedicine and mobile healthcare within the established healthcare system.



Since its market launch, the PCA 500 medical-grade 12-lead ECG system has garnered praise in the healthcare industry. In addition to being innovative and practical, solving many of today's medical challenges, Jackal Chen believes that the startup ecosystem in Taiwan and the support from relevant institutions have also contributed greatly to the company's successful growth.

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Jackal Chen pointed out that the Taiwan branch of QT Medical was established in 2015. Over the past 8 years, an increasingly-dynamic startup ecosystem has developed in Taiwan. The policy resources of government agencies and the expertise of business accelerators have also grown rapidly. These resources and policies have been extremely helpful for startups to gain access to the market. The Taiwan Tech Arena, for example, has brought several startups to visit Japanese business leaders and medical institutions. Institutional support has improved the startup teams' standing in dialogue with the other side, allowing for more comprehensive and smoother communication. As a result, new communication channels have been created, opening up the local market.

Going forward, QT Medical aims to optimize its products further and expedite product marketing efforts. In the near future, the company will focus on the markets of developed countries and actively collaborate with various agencies to expand the application potential of its products, realizing the vision of mobile healthcare and telemedicine.

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Bilink Corp.

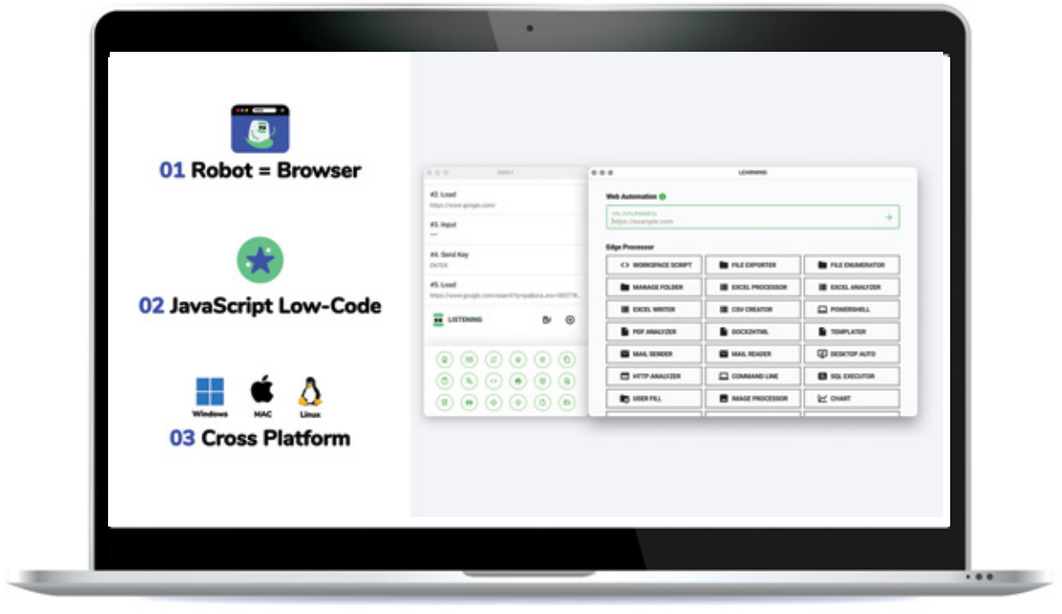
Leveraging Exclusive Web Browser Technology to Create the New Generation of RPA EMILY.RPA: More Efficient and Safer Enterprise Procedures

Enterprise operations are facing increasing challenges due to intense competition in global industries. Repetitive tasks with heavy workloads, high risks caused by human operations, inefficient resource utilization, heavy pressure during business peaks, and increasingly-complex cross-platform system operations—these factors not only consume a significant amount of time and energy but also hinder enterprise innovation. Now, many enterprises have introduced robotic process automation (RPA) to address the aforementioned pain points. The new generation of EMILY.RPA, launched by the startup team BILINK CORP., features a unique built-in web browser that not only boosts work efficiency but is also outstanding in terms of safety, usability, reliability, and integration. Currently, it has been adopted by several large domestic and foreign enterprises.

Jerry Tseng, founder of BILINK CORP., pointed out that digital transformation has taken the world by storm, and enterprises have become more reliant on IT systems. In recent years, most enterprises have started to migrate documents and applications to cloud platforms. Cloud platforms can save enterprises the cost of building IT infrastructure and come with the advantage of immediate access via online login, thereby increasing operational efficiency. Under this trend, the role of PCs at work has gradually shifted from merely operation platforms to serving as the portal for web browsers to log into cloud platforms. However, there are information security concerns regarding RPA solutions from various brands that utilize users' web browsers to log into cloud platforms or search for information on web pages. EMILY.RPA has addressed these issues through its unique design.

EMILY.RPA has four main features. Firstly, it can utilize RPA technologies to imitate ways in which humans operate computer software to achieve process automation. Additionally, it can directly interact with various types of software and cloud applications, eliminating the need for communication with software developers to perform custom modifications when implementing automated tasks. Secondly, the low-code and no-code scripting functions are designed through the combination of EMILY.RPA and machine learning algorithms. Low-code is a traditional programming method that allows professional programmers to easily adjust processes to fit their needs through minor modifications in coding. No-code, on the other hand, enables non-professional programmers to easily and quickly train and utilize EMILY.RPA through icons on the visual programming interface. It can automatically complete searches for market information and organize such data into specific formats that meet enterprises' requirements, among other tasks.

The third feature is, unlike other RPA tools that require operation via the user's personal web browsers and the installation of extension components, EMILY.RPA utilizes dedicated web browsers to conduct operations, further protecting enterprises' information security. Currently, this technology has obtained Taiwan patents, and U.S. patents are under review. The fourth feature is that EMILY.RPA supports Windows, Mac, and Linux platforms. Its range of applications can be expanded, enabling different system users to utilize this tool with high efficiency and strengthening the implementation of teamwork and communication. It simultaneously increases the flexibility of enterprise operations and ensures all internal users can receive the same user experience and technical support.



The features provide strong competitive advantages for EMILY.RPA. Currently, various types of enterprises have deployed it in their organization. Global panel manufacturer Innolux has boosted its work efficiency through the platform and resolved issues that could easily go wrong when handling repetitive tasks manually. In recent years, Innolux has actively promoted smart operations, with the aim of applying RPA in each department of the enterprise to improve their efficiency. Once EMILY.RPA is deployed, it can successfully resolve several long-standing issues. For instance, EMILY.RPA can precisely and efficiently collect price information from retail websites across the world, handle orders with diverse, complex content and special formats from international clients, and automatically complete tables required by companies. Aside from Innolux, logistics companies that need to handle a significant amount of receipts and order tracking information, as well as electronic commerce platforms that need to launch a significant number of products and have the demand for purchase, sales, and inventory management, have deployed EMILY.RPA. Jerry Tseng emphasized the architecture of EMILY.RPA is highly flexible, and it adopts a subscription model. Whether large companies or small and medium-sized enterprises with limited resources, all can easily increase their efficiency and reduce human operational errors through this platform.

Going forward, Jerry Tseng stated that digital transformation has become an inevitable trend. Optimizing work processes through digital transformation has become a necessary strategy for enterprises to increase their competitiveness, and the need for RPA functions from markets will also grow. The new generation of RPA must allow for easy and quick use in complicated scenarios. Thus, EMILY.RPA will leverage generative AI by training large language models (LLM) to enable RPA to swiftly understand users' needs through natural language and directly let robots' complete tasks automatically.

BILINK CORP. has been established for three years now, and the company has gained the trust of enterprises from different fields. Besides the hard work of its team, Jerry Tseng believes that policy support from the government is also one of the key reasons why the company has achieved outstanding performance. He pointed out that in recent years, the government has been actively improving the domestic start-up ecosystem, optimizing related regulations, and providing support. For instance, the Company Act, which was amended in 2018, allows the shareholding structure of start-up teams to be more flexible, thereby creating more sources of funding. Furthermore, the Taiwan Tech Arena (TTA) offers opportunities to participate in international exhibitions. It aim is to increase companies' product visibility and make it easier for them to meet clients from overseas markets. BILINK CORP. appreciates the support from the government and TTA. The company will continue to strengthen the efficiency of its products in the future. Additionally, it aims to assist enterprises in various fields in implementing digital transformation through features such as high efficiency, safety, and usability.

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Jmem Tek

Jmem Tek enhances chip security, helping prevent chips from being physically cracked by reverse engineering

With the coming Internet of Things (IoT) era, a large number of devices will be connected to the Internet. While this trend brings convenience, it also brings an increased risk of equipment being hacked and chips being illegally copied. Faced with such threats to information security, the Taiwanese start-up Jmem Technology (Jmem Tek) has developed various products, such as MSOTP and PUF, that can help companies raise their storage density, prevent physical attacks, and generate random data for higher unpredictability, to meet the market's high demand for security.

John Chang, CEO of Jmem Tek, pointed out that there are several pain points in information security for chips. First, most memory chips are very similar in their structure, while the main difference is the firmware. This similarity makes it easier for hackers to crack. Second, a large amount of firmware is stored in OTP (one-time programmable) memory. Protecting firmware has thus become the current key to information security. Third, chips are exposed to the risk of reverse engineering. Hackers can easily obtain chip data by removing the coating or using physical methods such as X-ray. Jmem Tek's technology can solve those pain points.

Jmem Tek was co-founded by four graduates of the College of Electrical and Computer Engineering of National Yang Ming Chiao Tung University—John Chang, Paul Lo, Johnny Lu, and Jerry Chang, with their product concepts originating from John Chang's doctoral thesis. The company currently houses a team of 15, whose members' backgrounds include electronic engineering and other professional fields. John pointed out that, in its early days, the Jmem Tek team actively participated in competitions to promote its innovative concepts and technological achievements. And it did quite well—for example, this year (2023), it was invited to participate in the City-Tech. Tokyo event for startups, the world's largest urban technology exhibition, hosted by the Tokyo Metropolitan Government. In September, it was selected as second place in the TW-SG Startup Exchange Program and was invited to the Singapore Week of Innovation and Technology (SWITCH). Then, in November, it was selected into the TINVA TOP 10 Startups by the Industrial Technology Research Institute (ITRI) New Venture Association (TINVA), showing the company's potential for development.

John then introduced Jmem Tek's major technologies. Its patented MSOTP is a major innovation in the field of anti-fuse OTP memory. Each device unit in MSOTP can store two bits of data. That means fewer transistors can store the same amount of data as in traditional methods. In addition, the structure Jmem Tek designed makes it difficult for physical attacks such as X-ray and decapping to attain the storage status of the MSOTP. Since it is also highly compatible with the CMOS logic process, the technology requires no additional photomask during the manufacturing process, meaning production costs can be reduced.

MSOTP's low power consumption and small surface area are particularly suitable for IoT, where space is limited, and devices are distributed. Applications for MSOTP include secure data storage, key storage, sensor fine-tuning, parameter setting, function selection, etc. In addition, users can also integrate MSOTP and traditional OTP to avoid brute force cracking and meet higher security level storage requirements.

In addition to MSOTP, Jmem Technology's patented technology also includes hardware security technology PUF. PUF is a hardware security technology derived from non-uniformity in the wafer manufacturing process. The unique "uniqueness" and "unpredictability" of PUF can generate random sequences in the trust system, effectively reducing the risk of being cracked by the algorithm. Jmem Technology's patented PUF technology relies on its innovative structure to reduce chip area and improve performance, making it highly competitive in the market.

The technologies of MSOTP and PUF make the chip almost impossible to be cracked by reverse engineering, greatly improving the security strength. The company's current business model is to provide design services to IC manufacturers, John pointed out. This technology is particularly suitable for small and medium-sized enterprises or start-up teams that cannot easily obtain relevant resources from large IC design manufacturers. Jmem Tek can assist customers with limited scale to quickly meet the security needs of the market.

Regarding future development, John said that Jmem Tek will focus on the two major areas of the Internet of Things and vehicle-mounted systems, as well as AIoT protection algorithms and solutions that combine the algorithms on the device side to avoid algorithm theft. There are a large number of edge devices in the Internet of Things, and the functions of chips are single and there are many cost considerations. The company's solutions help manufacturers in this field create economical and simple systems. The automotive market has taken off rapidly in recent years, and industry players and consumers have become increasingly aware of system security. Jmem Technology's patented technology meets these needs. Since the automotive field requires long-term certification, the initial focus will be on the Internet of Things. The automotive market development strategy is to first establish cooperative relationships with industrial supply chain manufacturers and enter the market step by step.

It has been about a year and a half since its establishment in April 2022. John's feelings about Taiwan's innovation environment are quite positive. He pointed out that Taiwan currently has a vibrant atmosphere for innovation, with policies, regulations, and various plans becoming more and more complete, such as the startup cluster planned by TTA and InnoVEX, helping startups to participate in COMPUTEX. For start-up teams with limited resources, it will bring huge help in technology exposure and fundraising. In addition, he also hopes that there will be more resources and policies focusing on early-stage start-ups in the future. It allows teams with the potential to accelerate their maturity and create a win-win vision of co-prosperity for both the enterprise and the country's economic development.

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DeepRad.AI

Lung Cancer and Coronary Artery Calcification Risks Screening Simultaneously—DeepRad.AI Realizes Vision of Preventive Medicine

According to the latest Taiwan Cancer Registry published by the Ministry of Health and Welfare (MOHW) in November 2023, lung cancer has overtaken colon cancer as the most common type of cancer in Taiwan. It is also one of the leading causes of death around the world. One of the reasons that lung cancer has such a high mortality rate is that it is often only diagnosed in later stages when the best time for treatment has lapsed. Therefore, early screening is of utmost importance. The DeepLung-CAC developed by DeepRad.AI employs multimodal AI technology, utilizing low-dose computed tomography (LDCT) imaging It aims to achieve the goal of preventive medicine by detecting lung nodules and simultaneously predicting the risks of coronary artery calcification.

DeepRad.AI is a spin-off company of Taipei Medical University founded by the university's former president, Professor Cheng-Yu Chen, a specialist in AI research. The company's research and development are centered on reducing case fatality rates through early detection and prevention, aiming to optimize the utilization of healthcare resources in society. Yao-Chi Chang, the CEO of DeepRad.AI, emphasized that the earlier lung cancer is detected, the higher the chances of recovery. With conventional X-ray technology, locating nodules is challenging, and by the time symptoms are identified, the cancer often progresses to stages three or four, resulting in a survival rate of only 10-30%. The widely used LDCT is highly effective, and capable of detecting stage one or even stage zero lung cancers, significantly boosting the survival rate to over 90%.

Nonetheless, the evaluation of LDCT lung cancer screening results currently relies on radiologists. The latest CT scanners can now offer up to 640 slices, resulting in a significant increase in the number of images for analysis. This surge in workload poses a substantial impact on doctors' productivity. In contrast, the DeepLung-CAC optimizes the clinical workflow to address these challenges.

According to Yao-Chi Chang, DeepLung-CAC can provide doctors with preliminary results within five minutes after the completion of the LDCT scan. The patient's old and new images can also be compared to identify any nodular changes, assisting the doctor in explaining the screening results to the patient. Furthermore, DeepLung-CAC can automatically generate lung cancer screening reports that align with the Health Promotion Administration (HPA) standard. This significantly reduces the time required by doctors for analysis and report generation, enhancing the accuracy of test results and overall productivity.

In addition to lung cancer screening, the DeepLung-CAC can simultaneously assess coronary artery calcification risks. Coronary artery calcification serves as a crucial indicator for evaluating the risk of cardiovascular disease. DeepRad.AI utilized paired data (i.e., examination data from simultaneous screening for lung cancer and coronary artery calcification) to train DeepLung-CAC. This enables the platform to simultaneously detect early-stage lung cancer and assess coronary artery calcification risk in a single LDCT scanning session. Following four years of research and analysis, DeepLung-CAC is now capable of screening for these two diseases, which rank as the first and second leading causes of death in Taiwan, using a single LDCT scan.

The platform is currently undergoing clinical trials in anticipation of TFDA approval, expected to be granted in 2024. Clinical trials are underway at Taipei Medical University Hospital and Shuang Ho Hospital, where the platform has demonstrated improved CT interpretation efficiency.

As for the market potential of DeepLung-CAC, approximately 500,000 people in Taiwan are categorized as high-risk for lung cancer, but only 50,000 underwent government-funded screening last year. If the concept of preventive health gains widespread acceptance, this could lead to a tenfold increase in overall screening volume in Taiwan. However, with only 1,600 radiologists currently available, there is an urgent need for AI to reduce their workload and enhance the quality of care. DeepRad.AI aims to assist and optimize the overall process for radiologists using AI. By improving the efficiency of lung cancer screening and early detection rates, the vision of successful lung cancer prevention and treatment can be realized.

DeepRad.AI has made progress in screening for lung cancer and coronary artery calcification. The next step is to proactively develop predictions for osteoporosis and dementia. The company aims to contribute to innovative breakthroughs in the fields of preventive health and diagnosis.

Yao-Chi Chang pointed out that the team's hard work and Taiwan's innovation-friendly environment are the two main factors to success. In addition to a focus on research and development, precise and effective market planning is crucial for start-ups to promote their products. He expresses hope that policy support from government agencies will attract the attention of foreign investors to DeepRad.AI's technology and platform, facilitating successful commercialization. Looking ahead, he envisions Taiwan refining its laws, regulations, and auxiliary policies to leverage its capabilities in technology and healthcare sectors, creating an even greater competitive edge in smart healthcare.

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PurismEV

Boosting EV range by 40%, PurismEV's AI energy efficiency system eliminates range anxiety

Electric vehicle (EV) makers exert every effort to resolve range anxiety by boosting the EV range by either increasing the battery output or decreasing the power consumption. As opposed to today's commonplace approaches of raising the battery capacity, Taiwan-based startup PurismEV has developed an AI-enabled adjustment system that improves the EV battery and motor efficiency based on driving habit analysis, thereby increasing the EV range by more than 40%. The system provides a quick solution for automakers, ride-sharing fleets, and logistics companies with a limited budget to optimize their operating costs.

According to PurismEV COO Ming-Hsuan Chu, raising the battery capacity may increase the EV range but it also adds to the vehicle's cost and weight. A smarter approach is to both increase the battery energy efficiency and decrease the power consumption. PurismEV's solution performs automated EV system calibrations based on driving habits and throttle control to thereby significantly boost the EV range with no need for larger battery capacity.

As a seasoned veteran in the motorcycle industry, Chu started her career in the motorcycle component import/export business, searching for suitable Taiwan-made products for foreign motorcycle manufacturers. She discovered the enormous development potential of EV components after receiving a big order. This motivated her to found PurismEV with Gigi Huang, who has abundant experience in EV batteries. Joining forces, they endeavor to develop solutions that enhance EV energy efficiency while considering costs.

In charge of the startup's product R&D, Huang designed PurismEV's AI energy efficiency solution to comprise two elements – an in-vehicle system and a cloud-based platform. The in-vehicle system collects the throttle and the driver's behavior data and adjusts the throttle responses according to machine learning algorithms. The collected data is forwarded to PurismEV's cloud platform with built-in digital twin models with the following features: 1) AI-based battery and motor degradation prediction, 2) battery safety and health prediction, and 3) driving habits analytics and creation of optimized control instructions. All these data mentioned above are then sent back to the in-vehicle system to perform optimized vehicle control, thereby boosting efficiency and safety.

Compared to conventional fleet management systems, PurismEV's solution delivers more on-target and effective energy efficiency enhancements. Conventional fleet management systems have the in-vehicle computer log the data collected from the throttle and brake sensors which is downloaded from the vehicle after it returns to the base. The data is then analyzed and based on the results, drivers are assisted automatically to develop better driving habits, which is thanks to the unique dynamic calibrations done by PurismEV. There are two EV throttle control modes generally used by vehicle OEMs: Eco mode with power limitation and fixed throttle response curve, both of which could only deliver between 17% to 19% reduction in power consumption.

PurismEV's solution dynamically adjusts the throttle curve based on software calculations of motor operating conditions detected by the sensor. The dynamic calibrations consider the real-time data of the driving scenario, driver behavior, and motor condition and enable the motor to output a constant torque. Field test results indicate PurismEV's solution achieves over 40% energy savings. Moreover, automated calibrations are performed by the system with no driver interference, which ensures the energy efficiency enhancement is delivered without failure.

Apart from the energy efficiency enhancement, PurismEV's product development process is another noteworthy feat. Both co-founders are seasoned veterans in the motor vehicle business. Huang, in charge of system R&D, drew on his practical experiences and leveraged Taiwan's complete supply chain resources to develop PurismEV's solution in just ten months, from design to commercialization. PurismEV has also secured a stable component supply. With ready access to components on the market, PurismEV has full control of the costs and volume production process.

PurismEV operates two business models. The in-vehicle system is provided on a one-time sale basis while the cloud service is offered on an annual subscription basis. Its target customers include ride-sharing service operators and logistics companies with their own fleets. Its solution has been adopted by a major motorcycle ride-sharing service provider in Taiwan for trial purposes, proven to deliver over 40% energy savings as promised. As part of its efforts to expand globally, PurismEV has made itself seen on multiple occasions in markets abroad and is actively engaging with European and American customers to broaden its reach.

With the commercialization underway, PurismEV's solution was recently showcased at trade exhibitions in Italy and the U.S., gaining market visibility. Chu noted that Taiwan-based startups are expanding their presence in the worldwide market thanks to a friendlier environment fostered by government support policies and private-sector investments. The types and quantity of investors are both rapidly growing, giving rise to more opportunities for startups to get funded. Chu hopes for prosperity to continue and invigorate Taiwan's industry, thereby creating a win-win situation for the business sector and the community.

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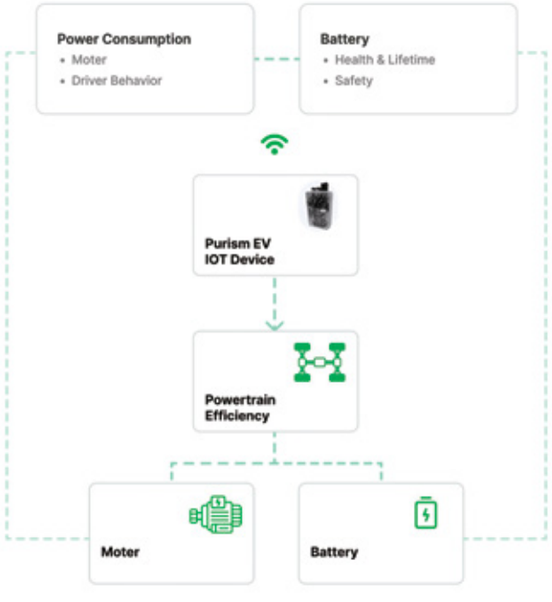

TAIWAN TECH ARENA Event Summary
From Sep. - Nov. 2023

TTA Celebrates 5th Anniversary, Connecting Taiwan to the Global Startup Ecosystem

To celebrate the fifth anniversary of Taiwan Tech Arena (TTA), a two-day TTA Fifth Anniversary Ceremony was held on September 11 and 12. The opening ceremony was graced by the attendance of Premier of Executive Yuan Chien-Jen Chen, who delivered a speech, along with representatives from various ministries, local governments, foreign diplomatic missions in Taiwan, renowned entrepreneurs, investors, TTA international accelerators, and representatives from Taiwan's startup ecosystem. Together, they witnessed the fruitful achievements of the past five years and expressed their continued support.

Executive Yuan Minister without Portfolio and Minister of National Science and Technology Council (NSTC), Tsung-Tsong Wu, stated that with the assistance of various stakeholders, TTA has successfully cultivated Taiwan's startup ecosystem over the past five years. This has significantly enhanced Taiwan's visibility and in-fluence in the global technology startup scene. He also expressed the hope that in response to the Taiwan Chip-based Industrial Innovation Program (Taiwan CBI), TTA will attract top international chip startups and innovative teams to Taiwan, contributing to Taiwan's position as a hub for international chip design and innovation applications. This will deepen cooperation with various industries in Taiwan and continue to make significant contributions to the global industry innovation driven by chips.

TTA 5th Anniversary International Forum #part_1 - Bringing IC Driven Innovation to the Forefront of the 21st Century Industrial Evolution.

TTA invited globally renowned experts in chip innovation and enterprises that have successfully utilized chip innovation to upgrade their products to participate as forum guests. This included industry leaders such as MediaTek, Microsoft, Qualcomm and others. Together, they explored the trends in chip application development and discussed the opportunities and challenges in new collaborative innovations related to chip applications.

TTA 5th Anniversary International Forum #part_2 - Tech Startup Scaling Up and Going Global

In this forum globally, renowned experts from the technology hardware and software industries shared how chip innovation propels technological advancements in Taiwan's industries. From an international perspective, it explored the prospects for success in technology startups and engaged in discussions on how Taiwanese startups can expand their presence on the global stage.

TTA 5th XYZ Forum: Opportunities and Challenges in Cultural Technology Startups

The second day of the celebration of the TTA 5th anniversary invited successful leaders from the XYZ generation, who have effectively integrated technology and culture. The discussion focused on the opportunities and challenges of integrating technology and cultural arts in innovative ventures, providing a platform for cross-industry and generational exploration of new possibilities.

Lithuanian business delegation visited TTA to enhance bilateral cooperation in technology startups

Viktorija Cmilyte-Nielsen, Speaker of the Lithuanian Parliament, led a business delegation to TTA, joined by government officials and representatives from nearly 20 startups and associations. They interacted with six TTA accelerators and over 40 Taiwanese companies, paving the way for enhanced cooperation and international market expansion between Taiwan and Lithuania, fostering further bilateral and transnational collaborations.

TTA Global Series Events

Our forum on 10/26 was a true testament to the power of collaboration between established companies and startups. We were thrilled to have a prominent supporter reaffirm their commitment to our startup ecosystem initiative. The 10/30 forum was an exciting exploration of opportunities in Southeast Asia's digital transformation. Furthermore, Global Night was a resounding success, bringing together over a hundred individuals from various sectors. It vividly showcased Taiwan's vibrant energy and appeal in the global innovation ecosystem.

TTA TALK at FCU: AI and Robotics

TTA Talk encourages professors and students to apply research technology to industry and exert influence in societal change. In collaboration with Feng Chia University, TTA invited two distinguished speakers from the AI and robotics fields, including the founder and CEO of FREE Bionics Inc., Wu Cheng-Hua, and the Director of ROSO COOP, Sheng Yu-Tung. They shared their entrepreneurial journey, challenges, and experiences in entering the international market. The sharing by these entrepreneurs aims to inspire and motivate the attending young students to unlock their entrepreneurial potential

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