

CONNECTING ENTERPRISES TO INNOVATION

2017/18 Year in Review



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ABOUT IPI

IPI catalyses and enables enterprises to grow their businesses through technology and innovation. An affiliate of Enterprise Singapore, IPI promotes open innovation, and works with enterprises to source for technologies locally and abroad. In addition, it facilitates technology partnerships to bring new and innovative products and services to the market.

Connected to a global network of technology partners, including the Enterprise Europe Network (EEN), IPI is well-positioned to facilitate connections between technology seekers and providers, driving growth and innovation opportunities for Singapore enterprises.

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It has been a rewarding 2017/18 for the team at IPI as we put into action a new strategy to enhance our support to help local enterprises grow their businesses through technology adoption. Not only did we exceed our targets this year, we also conceptualised new initiatives complementary to our suite of innovation services, which we will execute as part of the Research, Innovation and Enterprise (RIE) 2020 Plan.

This year, we successfully facilitated 79 technology matches and assessment projects, surpassing past performances. Our annual flagship technology marketplace event, TechInnovation, attracted over 3,900 participants from more than 40 countries—a 44 percent increase from the turnout in 2016. It was a tremendous success, with more than 160 exhibitors showcasing over 400 enabling technologies over a two-day period.

We were pleased to find out that Enterprise Europe Network Singapore—a consortium that includes IPI—came in fourth on a global ranking of network partners in major international growth markets. In the past year, it established 19 business deals as well as technology transfer and R&D partnership agreements between companies in the European Union and Singapore. One such technology partnership was established at TechInnovation 2017, between Singapore-based SODA VISION, which provides machine vision and imaging technology solutions, and Slovakia-based Photoneo, which provides 3D vision scanning solutions.

We are now part of Enterprise Singapore (ESG), a single enterprise development agency formed on 1 April 2018 to help local enterprises grow stronger and stay globally competitive. To support ESG's Gov-PACT initiative, we piloted the Gov-PACT portal in January 2018 for the National Environment Agency's joint innovation call for environmental services solutions. Not only will government agencies be direct beneficiaries of crowdsourced innovative technologies, they will also be reference customers for small and medium enterprises (SMEs) and start-ups as they scale locally or export overseas.

Over the past 12 months, IPI's greatest sense of accomplishment was in seeing both technology seekers and technology providers mutually benefit from the platforms built by IPI. On behalf of IPI, I thank our partners from the enterprise and innovation community for your collaboration and support. I must also thank my colleagues for your dedication in driving IPI's mission.

Moving forward, we will continue to strengthen IPI's various platforms to better foster technology partnerships between SMEs, government agencies and our global technology partners. With your support, we are committed to growing a vibrant innovation ecosystem in Singapore in the years to come.

Professor Lam Khin Yong
Executive Director, IPI

MESSAGES FROM
IPI MANAGEMENT

As IPI moves into its eighth year of operations, partnership remains at the core of everything we do. Since 2011, we have built an international network of partners with whom local enterprises can leverage enabling technologies, expertise and intellectual property to fill gaps in the market and create new possibilities.

The road to technology commercialisation can be a long and complex one. On average, it takes two to five years to bring a new technology prototype to market, while many others will simply not make it. Hence, we are thrilled to share with you our success stories—these are technology collaborations seeded by IPI in the early years that have come to fruition.

One such success story began at TechInnovation 2013. The Institute of Technical Education (ITE) exhibited a prototype that can be used during percutaneous nephrolithotomy surgery. Subsequently, discussions led to a multi-party co-development project and a licensing agreement signed by ITE, National University Hospital, National University of Singapore and Invivo Medical Pte Ltd, a start-up funded by HCMT Holdings Pte Ltd. Sales of the device are projected to reach S\$25 million over the next five years.

IPI is fortunate to be located in a region bustling with innovation and economic activity. Approximately 60 percent of the technology offers listed on our online portal come from ASEAN countries such as Singapore, Thailand, the Philippines and Malaysia. Following a series of engagement activities, we have seen an

increase in listings from areas such as Health & Personal Care, Infocomm & Electronics, and Energy & Environment. Likewise, we have also seen a concomitant surge in interest from prospective companies that wish to license the technologies.

In 2017/18, we co-organised technology forums, industry roundtables and innovation matching events with our industry and technology partners across the innovation and enterprise ecosystem. In doing so, we are fulfilling IPI's mission of bringing together key opinion leaders to discuss issues that are critical to innovation development, introducing new emerging technologies across various industries, and pursuing collaboration opportunities.

As more and more enterprises place an emphasis on open innovation and seek new partners beyond their existing networks, IPI's role in the innovation ecosystem will only increase. In the upcoming year, we are inspired to showcase even more enabling technologies from the region on our platforms, and play a larger role in facilitating collaborations between technology seekers and providers everywhere.



Dr Sze Tiam Lin
Senior Director, IPI



INDUSTRY ENGAGEMENT

182 Singapore-based companies newly engaged



79

Successful technology matches and assessment projects

106

Active negotiations facilitated

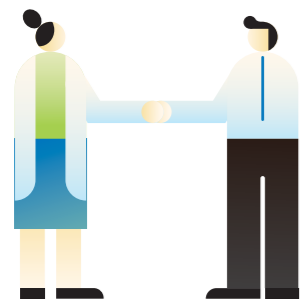
17

Events organised / supported

52

Technology needs posted

OUTREACH



352 Technology offers posted

TECHINNOVATION 2017

3,936

Participants

163

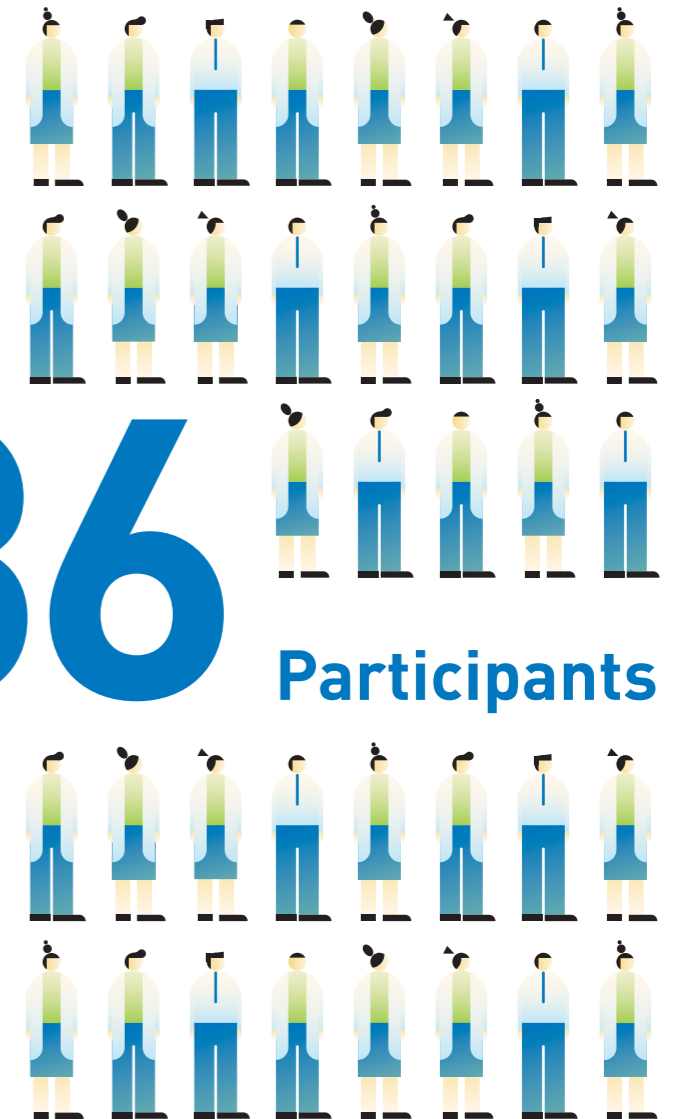
Exhibitors

42

Participating countries

410

Technologies showcased



KEY HIGHLIGHTS 2017/18

AUTM ASIA 2017

23-26 April 2017

As part of building thought leadership and outreach to technology transfer professionals in the region, IPI shared how to bridge gaps to foster Industry-University Collaboration at AUTM Asia 2017.



VISIT BY DELEGATION FROM SPAIN

23-25 May 2017

IPI hosted a Spanish R&D-focused delegation led by CDTI (Spain's National Innovation Agency) and PLANETIC (the Spanish ICT-based technology platform), and promoted technology partnership opportunities with Singapore partners in the area of Infocommunications and Electronics.

TECHINNOVATION 2017

19-20 September 2017

The sixth edition of TechInnovation saw a record high turnout of over 3,900 technology seekers and providers exploring business collaboration opportunities through open innovation. There were over 160 exhibitors showcasing more than 400 enabling and ready-to-market technologies.



WORLD BANK INAUGURAL GLOBAL INNOVATION FORUM

WORLD BANK INAUGURAL GLOBAL INNOVATION FORUM

04-06 October 2017

Dr Sze Tiam Lin, Senior Director, IPI was part of a panel session discussing the roles of governments, both as a source of demand for innovation and in promoting effective technology transfer. The panellists also discussed how public agencies can foster innovation and encourage local companies to innovate.



EEN ANNUAL CONFERENCE

20-21 November 2017

At the 10th Enterprise Europe Network (EEN) Annual Conference held in Tallinn, Estonia, IPI presented how EU SMEs can use Singapore as a gateway to the Asia-Pacific region for Europe-Singapore technology and business partnerships.



APEC SME WORKGROUP MEETING

27 March 2018

IPI was invited to present best practices in managing open innovation for SMEs at the 46th APEC SME Workgroup meeting in Brunei.



WIPO CONFERENCE

01-02 February 2018

Dr Sze Tiam Lin, Senior Director, IPI was invited by the World Intellectual Property Office (WIPO) to speak at the International Conference on IP in the New Technological Order held in Moscow, Russia. He shared insights on how support for innovation and IP management is evolving in the new technological era.

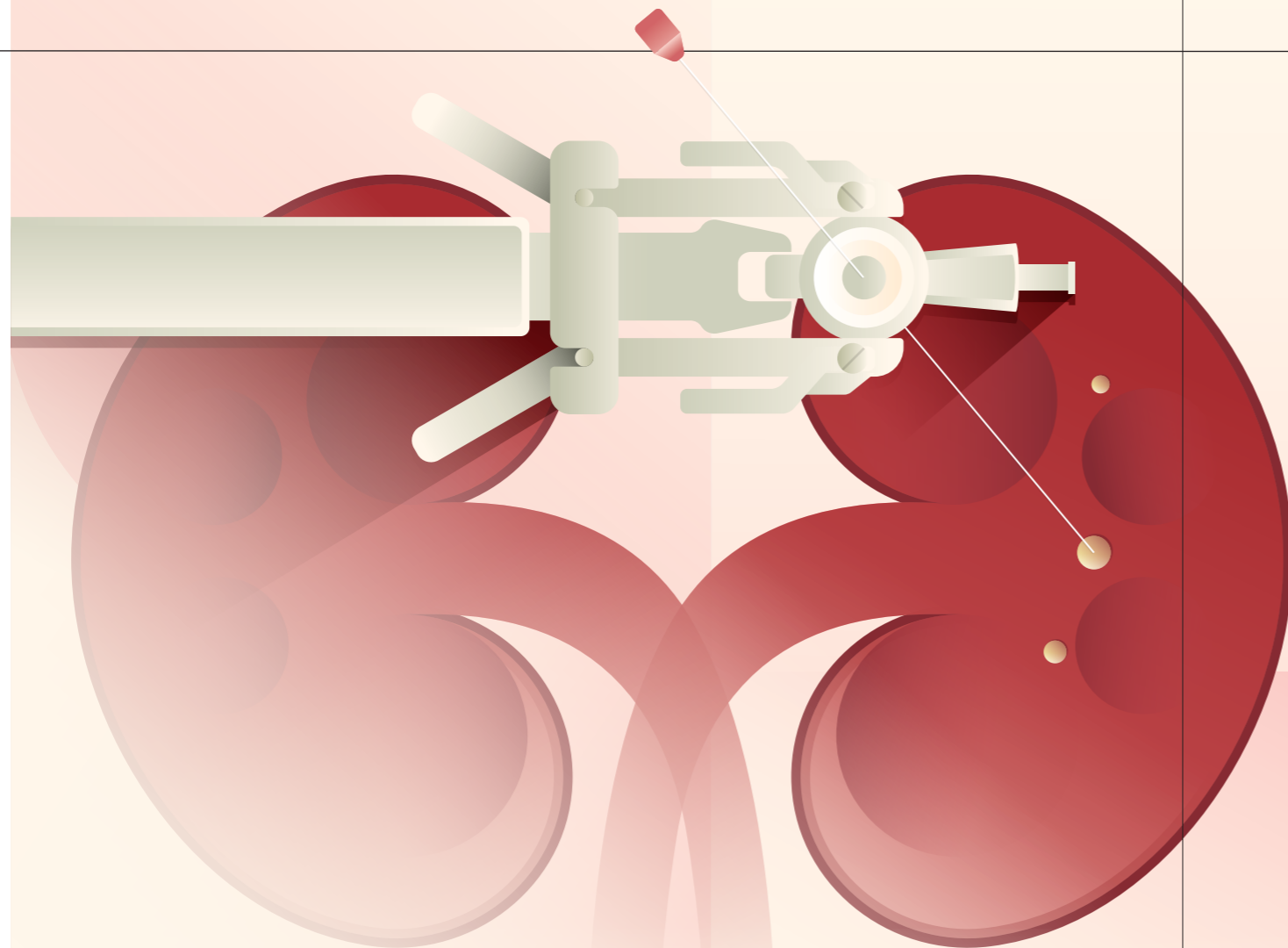


TECH PARTNERS NETWORKING SESSION

29 March 2018

IPI expressed its appreciation for the support demonstrated by its local and overseas technology partners at its sixth Tech Partners Networking Session.





INVIVO MEDICAL



INSTITUTE OF TECHNICAL EDUCATION



NATIONAL UNIVERSITY HOSPITAL / NATIONAL UNIVERSITY OF SINGAPORE

MAKING KIDNEY STONE REMOVAL SURGERY EASIER AND SAFER

The challenge

During percutaneous nephrolithotomy (PCNL)—a complex procedure to remove large or complicated kidney stones—surgeons insert a long hollow needle through the skin to reach the stones, followed by a surgical instrument to fragment and remove them. However, because surgeons rely on 2D X-ray imaging to locate the stones in a 3D environment, several attempts may be required to do so. This lengthens patients’ exposure to X-rays, as well as their recovery time.

The solution

Researchers at the Institute of Technical Education (ITE) developed the Percutaneous Access to Kidney Assist Device (PAKAD), which uses precision engineering mechanisms to align the needle with its target, ensuring higher accuracy and reduced risk of surgical complications. While PCNL is currently only performed by senior surgeons, PAKAD allows the procedure to be undertaken by junior surgeons as well.

In 2013, ITE demonstrated the PAKAD prototype at TechInnovation, IPI’s flagship technology-industry brokerage event. ITE was matched with a potential investor, HCMT Holdings Pte Ltd, which pursued a joint collaboration to further develop PAKAD, and later funded Invivo Medical Pte Ltd, a start-up aimed at commercialising the device.

Meanwhile, ITE also forged collaborations with the National University Hospital (NUH) and the National University of Singapore (NUS) to perform trials of the device, which showed that it could indeed simplify and shorten the PCNL procedure.

The outcome

In 2017, a licensing agreement was signed between ITE, Invivo Medical, NUH and NUS. PAKAD will be commercialised through Invivo Medical, and is expected to reach the market by end-2018 with projected sales of S\$25 million over the next five years.

“PAKAD is the result of a successful collaboration by three institutions and industry, and made possible by a match-up at TechInnovation 2013. Beyond this, we plan to constantly develop our product and apply the invention to more minimally invasive surgical and biopsy procedures.”

Dr Joseph Chai
CEO
Invivo Medical Pte Ltd



Invivo Medical will commercialise the PAKAD device as part of a licensing agreement that it signed with ITE, NUH and NUS.

SODA VISION X PHOTONEO

3D VISION ENABLES ROBOTIC BIN PICKING



The challenge

Enterprises are increasingly seeking to combine machine vision with robotics to enable smart manufacturing applications. One such application is robotic bin picking, in which robots are used to pick and place randomly located objects within bins such as storage containers. Robotic bin picking can be used to handle labour-intensive, monotonous tasks such as order fulfillment and loading and unloading, but is traditionally very challenging because of the high levels of accuracy required.

The solution

At TechInnovation 2017, SODA VISION, a Singapore SME specialising in machine vision and imaging technology solutions, was introduced to Photoneo, a Slovakia-based company offering 3D vision scanners and software. SODA VISION was particularly interested in Photoneo's 3D vision system for robotic bin picking.

The outcome

Following a series of discussions, SODA VISION and Photoneo entered into an agreement to collaborate on a bin picking project with a robotic arm provider. Demonstration workstations incorporating Photoneo's 3D vision scanner, an ABB six-axis robot and a gripper system have already been established.

“Our technology partnership integrates Photoneo’s vision scanner and motion algorithm for a high-functioning robot, allowing our clients to tackle the labour crunch and improve manufacturing efficiency.”

Mr Eng Chin Jack
Managing Director
SODA VISION



SODA VISION and Photoneo in Singapore.

From left to right: Photoneo Sales Director for Asia, Tomas Murgas; SODA VISION Managing Director Eng Chin Jack and Senior Application Engineer Chris Lee; and Photoneo Application Engineer Marcel Svec.



Robotic bin picking in action.

CLEARVUE TECHNOLOGIES

X

NANYANG TECHNOLOGICAL UNIVERSITY

X

SINGAPORE-HUJ ALLIANCE FOR RESEARCH AND ENTERPRISE

**CLEAR GLASS SOLAR WINDOWS
PROVIDE A RENEWABLE SOURCE
OF ENERGY**

The challenge

One of the most common ways of harnessing solar energy is through photovoltaic (PV) panels installed in solar farms or on the rooftops of residential or commercial buildings. In densely populated urban areas, however, the lack of land greatly limits the amount of solar energy that can be harvested.

The solution

An alternative approach is to turn vertical building facades—such as windows—into solar-producing panels, also known as building-integrated photovoltaics (BIPVs). Australia-based BIPV company ClearVue Technologies developed and patented a solar-energy-harvesting clear glass that converts sunlight into electricity via PV cells placed within the window frame.

Keen to seek collaborators in Asia, ClearVue Technologies participated in TechInnovation 2016, where it was connected with researchers at Singapore's Nanyang Technological University (NTU).

The outcome

A research collaboration agreement was signed in January 2018 between ClearVue Technologies, NTU and the Singapore-HUJ Alliance for Research and Enterprise Ltd (SHARE, the only international research centre of The Hebrew University of Jerusalem outside of Israel) to jointly develop methods for the printing of thin film solar cells onto glass, with a view to commercialising the technology.

“We are pleased that our participation at TechInnovation has given our technology fantastic exposure and opened new opportunities for us. We have since reached a new commercialisation milestone and are optimistic that the strategic collaboration with NTU and SHARE will bring about improved harvesting efficiency and pave the way for a robust innovation pipeline to fuel our growth.”

Mr Victor Rosenberg
Executive Chairman
ClearVue Technologies



ClearVue Technologies' energy harvesting solar glass was incorporated in a trial bus shelter in Melbourne, where it had to generate enough energy to light the bus shelter.



Mr Victor Rosenberg, Executive Chairman of ClearVue Technologies, at TechInnovation 2016.

WHAT OUR INDUSTRY AND TECHNOLOGY PARTNERS SAY



“An organisation like IPI provides an effective means to support industry development by bridging the gap between industry and academic research. IPI is able to focus on the needs of companies and translate these into technical requirements to source and match suitable technologies for companies. This approach benefits academics looking to engage industry or commercialise their technologies.”

Dr Piengpen Wongnapapan
Deputy Director
Institute of Technology & Innovation Management (INNOTECH)
Mahidol University

“With increased attention in commercialising research, an organisation like IPI can assist academic researchers to find industry partners and conversely, enable industry partners to tap into research and innovation to fuel enterprise development. I am pleased to work with the team at IPI, which has good platforms like an online portal, TechInnovation and one-to-one support to engage with innovative enterprises.”

Prof Shlomo Magdassi
Head of Functional and 3D Printing Center
Chair, Institute of Chemistry, The Hebrew University of Jerusalem



“I’d like to thank IPI for connecting me to Nanyang Polytechnic (NYP). The match facilitated by IPI enabled my start-up to work with NYP to build the world’s first 3D dynamic insole scanner, which is now commercially available. Our partnership with NYP has led to more collaborations and technology licensing opportunities. Beyond the match, IPI has proactively catalysed and matched innovation and industry partners that have benefitted my start-up.”

Mr Glen Hinshaw
CEO & Founder
RESA Pte Ltd

“Sabanci University has benefitted greatly from our partnership with IPI. From the annual technology marketplace, TechInnovation, to the online portal and one-to-one matching facilitated by IPI, Sabanci University has been able to generate quality leads and interest in our technologies. The team at IPI possesses good experience and insights into technology commercialisation, and is able to facilitate win-win industry collaboration for our university.”

Mr Mustafa Cakir
Patent Attorney and Licensing Lead
Sabanci University



**WHAT OUR INDUSTRY
AND TECHNOLOGY
PARTNERS SAY**



“IP Bridge is very excited to work with IPI. We share a common vision of promoting open innovation, which can unlock the potential of IP and benefit new businesses. IPI has made great progress in putting open innovation into practice via its annual technology marketplace TechInnovation, online IP marketplace, and one-to-one matching by a highly dedicated team. I look forward to working more closely with IPI.”

Mr Satoshi Konno
Managing Director
IP Bridge Inc.

“At Ngee Ann Polytechnic, the staff involved in technology development need support with technology matching and forging partnerships and collaboration with enterprises, to generate a win-win proposition for both parties. To achieve this, IPI’s support is critical. Through IPI’s platforms, technology transfer professionals can gain quick access to a wide industry network of enterprises looking for innovative technologies. Without doubt, IPI has played a critical role in the technology transfer and enterprise development landscape in Singapore.”

Mr Andrew Sabaratnam
Senior Director, Technology, Innovation &
Entrepreneurship
Ngee Ann Polytechnic



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