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**28 April 2016**

## **COMPANY UPDATE**

BrainChip Holdings Ltd (ASX: BRN) ("**BrainChip**" or "**the Company**") is pleased to provide shareholders with the following Company Update to accompany the quarterly cash flow report for the period ending 31<sup>st</sup> of March 2016.

### **Highlights**

#### **Commercial**

- **Joint Development and Marketing Agreement ("JDMA") signed with Applied Brain Research**
- **JDMA signed with Inilabs GmbH post quarter end**
- **Long term discussions with major companies continue**
- **Enquiry for the SNAP IP has risen considerably, consequently multiple meetings were conducted with potential licensees**
- **3 patent filed in quarter - more anticipated in 2016**

#### **Technology**

- **Milestone 3, a Client / Server ("C/S") tool developed on time and within budget.**
- **Autonomous Feature Extraction (AFE) functionality demonstrated**
- **Autonomous Visual Feature Extraction (AVFE) functionality achieved and demonstrated**

BrainChip is an Intellectual Property (IP) provider, the developer of a disruptive Spiking Neuron Adaptive Processor (SNAP) that has the ability to **learn autonomously in real time**. The SNAP IP can be incorporated into a large range of commercial end user products across a diverse list of business sectors. The SNAP development environment is a complete solution that offers potential partners the opportunity to license SNAP whilst receiving engineering support directly from BrainChip to fast track development.

During the quarter BrainChip announced the achievement of a number of major technical advancements that have helped to strengthen our IP licensing position. These additional



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capabilities contribute in advanced discussions of a commercial nature with a significant number of companies that understand the commercial benefits of incorporating SNAP into their core products.

Following the release of Milestone 3 the company has seen a significant increase in approaches by companies and we have had discussions with a growing number of potential licensees. These discussions are ongoing and we remain confident of achieving our earlier stated goal of achieving early revenue as a result.

We were pleased to announce that during the quarter we signed our first JDMA with Applied Brain Research (ABR). Shortly after this we announced the signing of a second JDMA with Inilabs GmbH of Switzerland post quarter end.

These agreements allow BrainChip to offer multiple integrated development environments around its disruptive SNAP Neuromorphic IP. This will facilitate the integration of SNAP IP into existing and new products that are currently under development by these partners. End-market applications include smartphones, Internet of Things (IoT), robotics, prosthesis and security to mention a few.

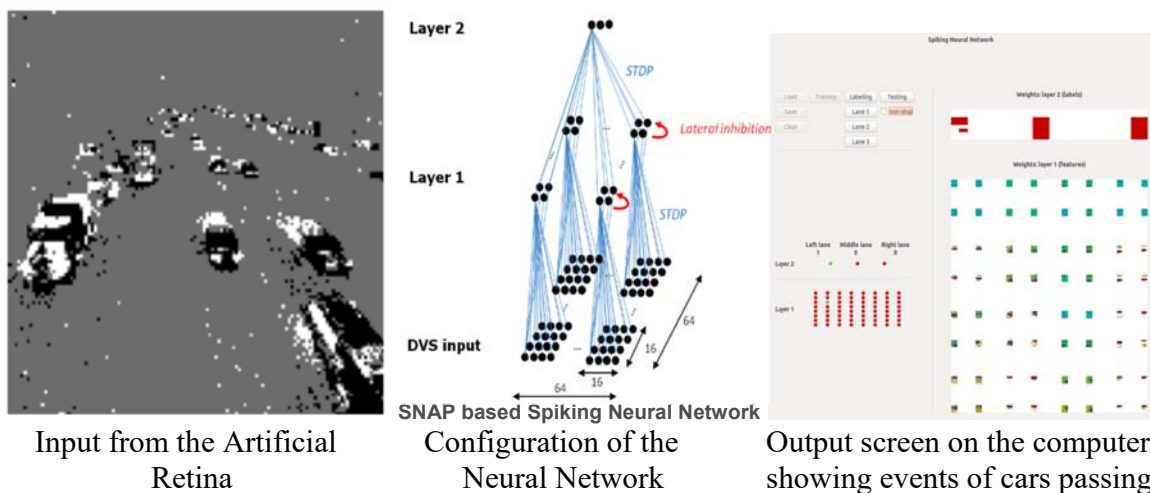
Aligning with key partners is a primary focus of BrainChip to offer complete integrated solutions without being distracted from core strengths. The Company is in discussions with a number of additional partners that may result in the formation of further alliances.

Operationally BrainChip was pleased to report the successful achievement of Milestone 3, achieving its goal of releasing a Client / Server Interface capability.

Important features and outcomes include:

- Demonstration of rapid machine learning - A disruptive event in Artificial Intelligence (AI) technology.
- Significant advantages demonstrated over deep learning devices;
  - Learning on the device itself instead of off-line on a supercomputer
  - Learning within seconds, with few samples
  - Unsupervised extraction of useful information from a fast stream of input data through autonomous feature extraction.
- A video demonstration was provided that shows a computer passing information to the SNAP processor, the SNAP processor learning autonomously to recognize events in this information stream, and passing the recognized events back to the computer.

- Input and output memory buffers allow the SNAP technology to process the data at up to 100 million visual events per second, and deliver the results almost instantly to the client.



### Autonomous and Unsupervised Learning

**Two significant technical achievements** were completed during the quarter. A major advancement to the existing SNAP IP was reached in February with the announcement of the completion of a unique **Autonomous Feature Extraction (AFE) System**. The AFE system is able to process and learn complex and overlapping real-world features.

Soon afterwards the Company announced the completion of an **Autonomous Visual Feature Extraction (AVFE) System**. The AVFE system was developed and interfaced with a **Dynamic Vision Sensor (DVS)** from leading developer and alliance partner Inilabs GmbH of Switzerland. AVFE is the process of extracting information from a streaming source. The system learns autonomously by repetition and intensity to recognize patterns in the image stream. BrainChip’s SNAP IP learns to recognize features within a few seconds, faster than a human, unlike Deep Learning systems which require millions of samples to train the device off-line on a supercomputer. “Deep Learning is rigid, it knows only what it is trained to know and it is unable to learn something new. BrainChip SNAP learns on the device, in real time and is able to learn



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new things on the fly. BrainChip SNAP embodies the next generation of machine learning” said Peter van der Made, Interim CEO and founder of BrainChip.

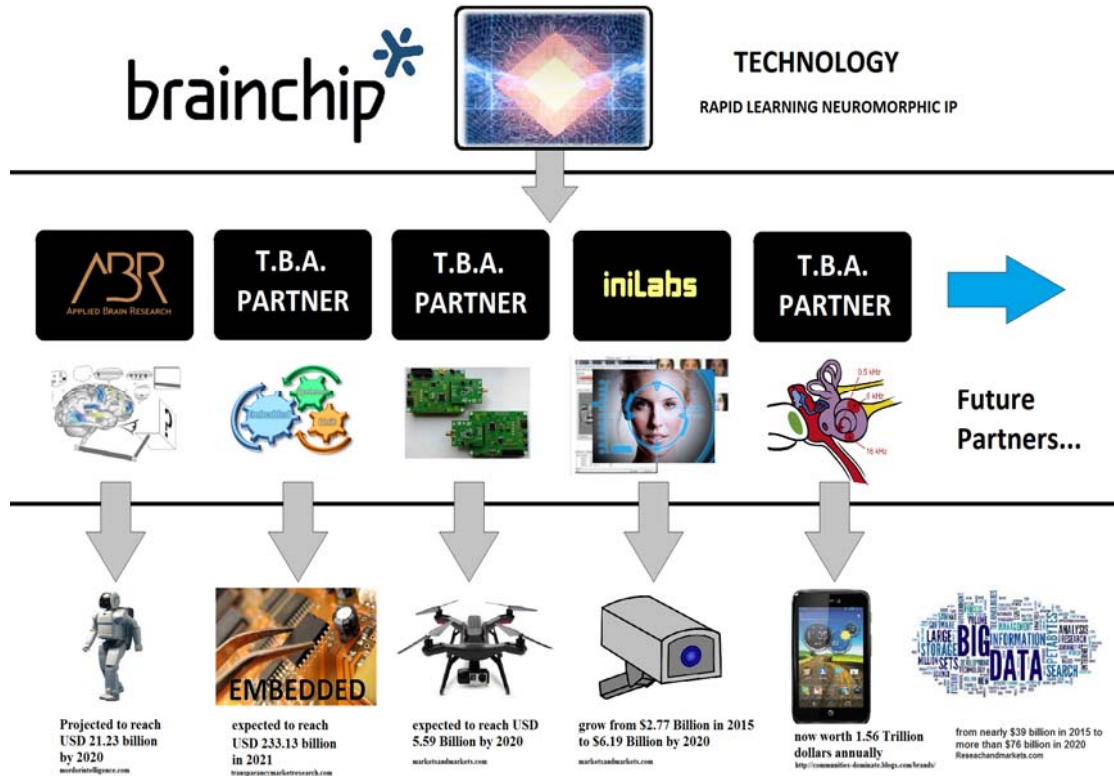
### **Marketing Strategy - Partners and Direct Sales**

The SNAP IP is intended to be embedded into intelligent products. These embedded products are otherwise known as “Neuromorphic Chips”, and find application in medical imaging, robotics, IoT devices, drones, intelligent security systems, portable and wearable electronics, and big data analytics. The Neuromorphic Chip market is forecast<sup>1</sup> to grow to \$4.798 billion USD by 2022. BrainChip is on track to release commercial IP that provides clients with energy-efficient Neuromorphic hardware that is orders of magnitude faster than current software solutions, able to learn autonomously, and able to be embedded into intelligent devices that are restricted in size and power consumption.

The Neuromorphic Chip market is only one revenue stream for BrainChip. The **first mover advantage** of our **Autonomous Learning** capability will ‘pull’ the Company into significant industry sectors which will generate attractive revenues in addition to chip royalties.

BrainChip has stated it will be generating revenue from three activities; licensing the technology, engineering fees and royalties based on chip sales from semi-conductor companies. The BrainChip Autonomous Learning capable SNAP IP is the foundation of solutions that meet the needs of end users in their customer products. Working with leading industry solution providers delivers the link between the Autonomous Learning and subsequent recognition functions of SNAP and the client product. Clients can work directly with BrainChip in creating a superior solution to prevailing problems.

The figure below shows how BrainChip’s growing number of relationships with Partners leads to the Company entering numerous different industries to expand the market opportunities for the SNAP technology, by providing complete solutions to existing problems. The BrainChip SNAP IP offers these industries a Spiking Neural Network solution that is fast, fully embeddable on the device, has a low power consumption and is capable of learning autonomously. The integration of partners’ know-how in their specific markets and BrainChip’s SNAP technology is a winning combination.



## Continued efforts to increase our Intellectual Property portfolio

In parallel with a busy development and marketing schedule, BrainChip has continued to strengthen its Intellectual Property (IP) position. During the quarter, three additional patent applications were filed bringing the portfolio up to one patent granted and six patents filed. Work continues to expand this patent portfolio.

## Summary

The first quarter of 2016 saw a number of major achievements by the Company. During the current quarter we are witnessing heightened awareness of BrainChip and its SNAP IP by the AI (Artificial Intelligence) industry. By working closely with our growing list of partners we expect to make significant strides in moving towards the first of many targeted license contracts. “We are continuing to strengthen our Intellectual Property position and we are in discussion with commercial partners to broaden our marketing reach in 2016. I am confident that we will excel,



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not only in creating commercial success in cooperation with our commercial and technical partners and this great technology of ours, but to make BrainChip the de-facto standard for machine learning” said Peter van der Made, interim CEO and founder of BrainChip.

Post the end of the quarter and at the time of this update the Company has announced a Non-Renounceable Rights Issue to raise approximately \$4 million. This capital raising initiative gives all shareholders the ability to apply for more shares and in doing so they will shore up the Company’s balance sheet as BrainChip strides to meet the market needs for this disruptive and vital technology.

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<sup>1</sup> <http://www.marketsandmarkets.com/PressReleases/neuromorphic-chip.asp>

### **About BrainChip Holdings Ltd (ASX:BRN)**

BrainChip Inc, located in Aliso Viejo, CA, has developed a revolutionary new Spiking Neuron Adaptive Processor (SNAP) technology that has the ability to autonomously and rapidly learn and associate information just like the human brain. SNAP technology learns in seconds. This exemplifies a new level of machine learning that is expected to surpass deep learning, which requires days or weeks to train. The SNAP technology is fast, completely digital, and consumes very low power. Additional information is available by visiting [www.brainchipinc.com](http://www.brainchipinc.com)

### **Forward Looking Statements**

This press release may contain certain forward-looking statements and information, as defined within the meaning of Section 27A of the Securities Act of 1933, as amended, and Section 21E of the Securities Exchange Act of 1934, as amended, and is subject to the Safe Harbor created by those sections. This material contains statements about expected future events and/or financial results that are forward-looking in nature and subject to risks and uncertainties. Such forward-looking statements by definition involve risks, uncertainties and other factors, which may cause the actual results, performance or achievements of BrainChip Holdings Limited to be materially different from the statements made herein.



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