



## ASX Announcement

### BrainChip Introduces a Powerful Neural Network Converter

Create Low-Power, High Performance Event-Based Networks from Existing Convolutional Neural Networks

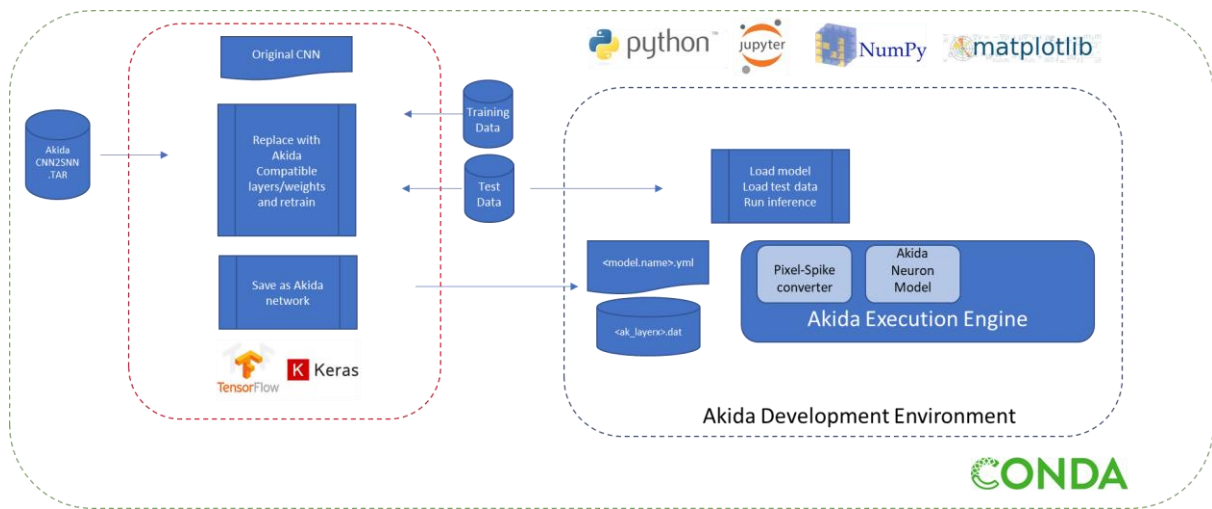
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- Landmark innovation in Neural Network design enables the next generation of AI Edge devices
  - Convert existing Convolutional Neural Networks to high performance, low power event-based Spiking Neural Networks
  - Utilize Industry Standard Neural Network Development Flows in a unified environment and reduce computational overhead
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**San Francisco, California – 12 June 2019**, BrainChip Holdings Ltd (**ASX: BRN**), the leading AI Edge company, today announced the availability of the Company's powerful neural network converter which enables users to easily convert existing convolutional neural networks (CNNs) to an Akida compatible event-based spiking neural network (SNN). The converter is integrated with the Akida Development Environment (ADE) to provide network conversion and simulation.

This unified flow represents the world's first commercially available development environment enabling both CNN and SNN implementations on the same hardware device while maintaining the inherent performance and power benefits of event-based neural networks. Users can achieve higher performance with a native SNN and faster time-to-market by using the CNN to SNN converter and the ADE.

The new CNN to SNN conversion flow is designed for ease of use and utilizes standard text files. Users can implement many CNN architectures targeted at edge applications such as image processing, anomaly detection, ADAS, robotics, and key word spotting. The conversion maintains near full accuracy with increased performance while eliminating neural network computational overhead. Post-conversion, the entire network is executed within the neural fabric of the Akida chip, which means that the host computational requirements of the neural network are eliminated. The host delivers the data to the chip and retrieves the results.

The conversion flow takes an input as a standard CNN description which the user modifies through a logical process to Akida compatible layers. The modified network description is then processed through standard quantization and training.



To optimize performance, the ADE supports programmable multiple bit-widths including binary, ternary and 4-bit for both weights and activations in each network layer. Once the final network configuration is achieved, the resulting Akida compatible network description is output in industry standard .yaml and .dat files. These files are run in the Akida emulation environment to generate performance information from the Akida device.

The Akida development environment including the CNN to SNN conversion capability is available today in beta release and is scheduled for general release in the third quarter of 2019. Upon request, the Company will provide detailed information about the performance of the Akida platform on industry standard benchmarks as well as novel implementations for Edge devices.

Roger Levinson, BrainChip COO commented, “The low power inherent in the Akida device will set a new standard in neural network design, implementation and performance. With no barriers to utilizing the Akida platform, Edge solution developers will have their cake and eat it too. They can leverage existing CNN solutions as well as incorporate next generation SNN solutions all in a single development environment and on a single device and achieve a low power solution without sacrificing performance.”



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

BrainChip Holdings Ltd is a leading provider of neuromorphic computing solutions, a type of artificial intelligence that is inspired by the biology of the human neuron. The Company's revolutionary and proprietary new event driven neural network technology can learn autonomously, evolve and associate information just like the human brain. The proprietary technology is fast, completely digital and consumes very low power. The Company provides hardware focused solutions that address high-performance requirements in civil surveillance, gaming, financial technology, cybersecurity, ADAS, autonomous vehicles, and other advanced vision systems. [www.brainchip.ai](http://www.brainchip.ai)

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