

---

## **Conversion of the Convolutional Neural Network implemented on Keras API to plain Python script**

Alahakoon A.G.P.D.<sup>1</sup>, Amaradasa H.D.S.<sup>1</sup>, Prasad K.V.S.<sup>1</sup>,  
Vidanagamachchi S.M.<sup>2</sup>, Wickramage N.M.<sup>1</sup>, Mahanama G.D.K.<sup>1\*</sup>

<sup>1</sup>*Department of Physics, University of Ruhuna, Matara, Sri Lanka*

<sup>2</sup>*Department of Computer Science, University of Ruhuna, Matara, Sri Lanka*

Artificial Neural Network (ANN) is a memory-based network designed to simulate the neuron functionality of human brain. The Convolution Neural Network (CNN) is an ANN capable of identifying the spatial textural features of digital images and classifying the images into categories. These characteristics allow CNN to classify clouds into categories using digital images. In order to implement ANNs on general purpose computers, a Python-based high-level deep learning library called Keras Application Programming Interface (API) was introduced recently. A CNN was built using Keras API, trained the model to classify clouds into categories and converted into Python script under this study. The CNN was able to classify the test data set into categories with 95% accuracy. Weights and biases parameters of the CNN were saved to a file. The model built by using Keras API was analysed and converted to pure Python code. The saved weights and biases file was analysed to implement in Python script. A methodology was developed to read and write weights and biases into a single file. The outputs of the pure Python code and Keras API model were tested against the test data set. The output of the test data set was identical for both models. The CNN model coded on Keras API can be successfully converted into pure Python code by the methodology utilized in this study.

**Key words:** *Keras, Artificial Neural Network, Convolution Neural Network, Python*

**Acknowledgements:** This research was supported by the Accelerating Higher Education Expansion and Development (AHEAD) Operation of the Ministry of Higher Education funded by the World Bank.

\*Corresponding author: mahanama@phy.ruh.ac.lk