Spiking Neural Networks

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Abstract

Use of Deep Neural Network, commonly referred to as *deep learning* spiked in recent years and has been used as a tool for impressive advancements in the field of *Artificial Intelligence (AI)* Spiking Neural Networks draw inspiration from the Purpose of this project is to demonstrate the capabilities of a Spiking Neural Network and compare it to a more conventional Object Recognition Deep Neural Network

1 Introduction

The dataset used for training, validating and testing the model was assembled by Microsoft and will be referred as COCO throughout this report Lin et al. (2014).

1.1 Imbalanced Threshold

$$f(x) = \begin{cases} 1, & \text{if } V_{mem} \geq V_{th,pos}(V_{th}) \\ -1, & \text{if } V_{mem} \geq V_{th,neg}(-\frac{1}{\alpha}V_{th}) \\ 0, & \text{otherwise, no firing} \end{cases}$$

References

Lin, T.-Y., Maire, M., Belongie, S., Hays, J., Perona, P., Ramanan, D., ... Zitnick, C. L. (2014). Microsoft coco: Common objects in context. In D. Fleet, T. Pajdla, B. Schiele, & T. Tuytelaars (Eds.), *Computer vision – eccv 2014* (pp. 740–755). Cham: Springer International Publishing.