Computational Intelligence
SNN Addendum Final Quiz

1. Which encoding method in SNN's represents information in the frequency of spikes?

   ◯ Temporal Encoding

   ◯ Rate Encoding

   ◯ Binary Encoding

   ◯ Vector Encoding

   ◯ SHA-256

2. Why are SNNs considered more energy efficient than traditional neural networks?

   ◯ They have fewer layers.

   ◯ They operate only on binary data.

   ◯ Spike events are somewhat sparse.

   ◯ They use cloud-based storage.

3. One of the challenges for SNNs is:

   ◯ Overfitting

   ◯ Training

   ◯ Energy Efficiency

   ◯ Real Time Operation

4. Real-time learning in SNNs can be achieved using which of the following principles?

   ◯ Backpropagation

   ◯ Reinforcement Learning

   ◯ STDP (Spike-Timing Dependent Plasticity)

   ◯ Dropout

5. The "black box" problem refers to:

   ◯ The inability to look inside hardware devices.

   ◯ The unclear inner workings and reasoning of neural networks.

   ◯ A special type of SNN.

   ◯ A method to encrypt data in neural networks.

6. The absence of a comprehensive theory for SNNs means:

   ○ They are not based on biological principles.

   ○ They cannot be implemented in real-world applications.

   ○ There's no unified understanding or framework on their inner workings and optimal designs.

   ○ They are purely theoretical and don't have practical applications.

7. Sketch a Neuron. Include the soma, dendrites, synapses, and axon.

Extra Credit

8. Given the emergence of SNNs and neural hardware, write a short paragraph on the future of neural compuring. Hypothesize on the trajectory of AI and neural computing in the next decade. How might these innovations influence areas like robotics, real-time control systems, and low-energy devices.