Research Report – Presentation Outline

Context

- Discuss the background and motivation for using Spiking Neural Networks (SNNs).
- Highlight their energy efficiency and real-time processing capabilities.

Approaches

- Present the SNN pipeline as a "black box".

Understanding the Models

- Models:
    - Leaky Integrate-and-Fire (LIF) for spiking dynamics.
    - Spike-Timing-Dependent Plasticity (STDP) for unsupervised learning.
    - Surrogate Gradient Methods for supervised learning.
- Motivation: Biological realism and energy efficiency.

Evaluation

- Metrics:
    - Accuracy.
    - Energy efficiency.

Results

- Numerical results.
- Visual examples: Object recognition and gesture classification.
- Highlight energy savings and competitive accuracy.
- Platforms: Intel Loihi.
- Variants: Compare SNNs with ANNs for energy and accuracy.

Conclusions and Future Work

- **Conclusions**: SNNs excel in energy-efficient, real-time tasks.
- **Future work**: Improved algorithms, scalability, and integration with advanced neuromorphic hardware.

***** Throughout the presentation, the limitations of SNNs will be highlighted.