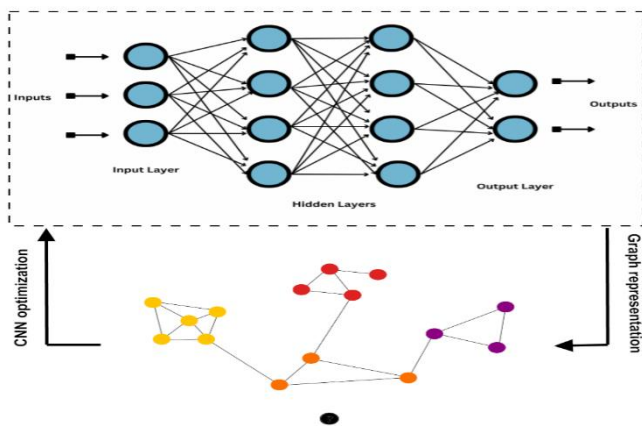


Master's Thesis



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Graph-Based Analysis and Verification for CNN

Background

In the context of runway identification, understanding and verifying the internal workings of a CNN is crucial. CNNs are often considered as "black boxes", making it challenging to comprehend and interpret how decisions are made, especially in safety-critical tasks like runway identification.

By employing a static graph representation of the CNN architecture, we can achieve a deeper understanding of the network's internal architecture and working. This representation allows for a clear visualization of the data flow, the role of each layer, and the interaction between complex features of the CNN.

Goal

This thesis aims to explore the use of static graph representation of CNN architectures as a tool for better understanding, verifying, and optimizing CNNs in the context of runway identification.

Tasks

This thesis can be structured into the following steps:

1. Conduct a state-of-the-art research study on CNN for runway identification
2. Construct a graph-based representation of the CNN Structure
3. Perform community detection and analysis on the constructed graph
4. Verify the CNN model behavior under varied conditions to detect potential biases
5. Optimize CNN performance by pruning irrelevant neurons and layers
6. Conduct experimentation and evaluation to verify the applicability of the proposed approach.

Details

We are particularly interested in candidates with a background in machine learning, particularly in CNNs. Experience with graph theory and optimization techniques would be beneficial. You are welcome to visit us in our office for further discussion.

We look forward to meeting you!

Applying

If you're interested, please send an email containing a short meaningful paragraph explaining why you are interested in this topic and your current performance certificate.