L65 Practical: Exploratory Paper Analysis

To complete the exploratory part of the L65 Practical, please choose **one** paper from the list below. You'll need to submit, together with your Practical Colab notebook file, a **4-page** writeup, covering **two pages per perspective**. The two perspectives are:

👩‍💻**Forward-thinking:**
Directly building on the paper's findings, propose one of the following:

- A **new research direction** *(accessible to AI researchers)*; or
- An **industry R&D direction** *(accessible to lay audience)*.

🕵️ **Backward-thinking:**
Study the broader **"backdrop"** that led to this paper.
Some example directions to consider (you may also propose your own!):

- *What provoked this work?*
- *Which paper(s)/discourse were critical in shaping this work's message?*
- *Why did this particular group of people get together to write this paper?*
- *To what extent did the paper achieve the discovered underlying aims?*

Focus on writing a **coherent** story rather than writing about too many aspects at once!

Paper List

- **AdS-GNN -- a Conformally Equivariant Graph Neural Network**
- **Can Classic GNNs Be Strong Baselines for Graph-level Tasks? Simple Architectures Meet Excellence**
- **Learning (Approximately) Equivariant Networks via Constrained Optimization**
- **Neural Sheaf Diffusion: A Topological Perspective on Heterophily and Oversmoothing in GNNs**
- **Probing Equivariance and Symmetry Breaking in Convolutional Networks**
- **Pure Transformers are Powerful Graph Learners**
- **Understanding Heterophily for Graph Neural Networks**
- **Understanding Transformer Reasoning Capabilities via Graph Algorithms**
- **Why does your graph neural network fail on some graphs? Insights from exact generalisation error**