Lecture 6, Question 1

- Define additive perturbations of graph shift operators
- Introduce distances modulo permutation written explicitly in terms of an error matrix $\mathbf{E}$
- Define the eigenvector misalignment constant δ

Lecture 6, Question 2

- State a theorem claiming the stability of Lipschitz filters to additive perturbations
- Explain the relevant constants that appear in the bound.
- The bound claims stability, which is stronger than continuity. Explain.
- The bound is universal for all graphs with a given number of nodes. Explain.

- Define relative perturbations of graph shift operators

- Introduce relative distances modulo permutation written explicitly in terms of an error matrix **E**.

- Define the eigenvector misalignment constant δ. Do not dwell too much on the definition of δ.

- Additive perturbation models of graphs are not as meaningful as relative perturbation models of graphs. Explain.

- State a theorem claiming the stability of integral Lipschitz filters to relative perturbations

- Explain the relevant constants that appear in the bound.

- Contrast the bound to the stability bound for additive perturbations of Lipschitz graph filters.

- GNNs whose layers are made up of Lipschitz filters are stable to additive deformations of the graph support. State a theorem and explain.

- GNNs whose layers are made up of integral Lipschitz filters are stable to relative deformations of the graph support. State a theorem and explain.

- Prove the theorem stated in Question 7. The instructor will take care of the proof. But if you are assigned this question you have be prepared to answer questions during the interactive meeting.

Lecture 6, Question 9

- Explain the stability vs discriminability tradeoff of graph filters

- Explain the stability vs discriminability tradeoff of GNNs

- Highlight their differences