

## Review of “Learning Graphons Using Neural Networks”

This project aims to approximate graphons using neural networks, which is an interesting and challenging topic. The student needs to get familiar with both graph(on) theory and neural networks, and then design and implement functions to achieve the goal. This thesis fulfills all the assigned subtasks, and helps us understanding, for the first time, the power of neural networks for modeling graphons.

The student used a very reasonable method to tackle this problem. The experimental results tell us that the current architecture is able to capture properties of some classes of graphons, but not all graphons, which inspires further studies.

The thesis is technically sound, and clearly explains what the student has done. In particular, the problem list in Sec 4.1.2 is quite informative. The report is well-written and comprehensive, though some part could be simplified.

In summary, the thesis is excellent, and the student deserves a good grade. Besides, I would expect someone to follow the idea and build neural networks modeling more graphons accurately.

### Minor Comments

1. P13 suggest the reader to have a look -> suggest the reader have a look
2. P16 with the number of vertices  $O(n^2)$ : big O is not correct here, should be Theta or Omega
3. P20 only only
4. P28 do we really use “source” and “sink” to call the nodes in the input and output layers? In Fig 3.1, the red “depth” is confusing.
5. P29 number elements -> number of elements (similarly, p43 number samples

-> number of samples)

6. P39 it is unusual to start a chapter with a picture like this