

# SerialExperimentsOlga

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Olga Yakobson

*February 4, 2022*  
Version: My First Draft





Department of Mathematics,  
Informatics and Statistics  
Institute of Informatics



Artificial Intelligence and  
Machine Learning

Bachelor's Thesis

## SerialExperimentsOlga

Olga Yakobson

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|--------------------|---|
| <i>1. Reviewer</i> | <b>Prof. Dr. Eyke Hüllermeier</b><br>Institute of Informatics<br>LMU Munich |
| <i>2. Reviewer</i> | <b>John Doe</b><br>Institute of Informatics<br>LMU Munich                   |
| <i>Supervisors</i> | Jane Doe and John Smith   |

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**LMU Munich**

Department of Mathematics, Informatics and Statistics

Institute of Informatics

*Artificial Intelligence and Machine Learning (AIML)*

Akademiestraße 7

80799 Munich

## Abstract

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## Abstract (different language)

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# Acknowledgement

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# Contents



# Introduction

A graph  $\mathcal{G} = (V, E)$  is a structure of vertices and edges.

Let  $X_v$  denote the node feature vector for  $v \in V$ .

$y_v \rightarrow$  associated label to node  $v \in V$

$h_v \rightarrow$  representation vector of  $v \in V$

$\{G_1, \dots, G_N\} \subset \mathcal{G} \rightarrow$  set of graphs

$\{y_1, \dots, y_N\} \subset \mathcal{Y} \rightarrow$  set of labels

$h_G \rightarrow$  representation vector  $y_G = g(h_G)$  predicted label of an entire graph

graph convolutional network

graph convolutional network

$K \rightarrow$   $K$ -th layer of a GNN ( $K$ -th iteration)

$a_v^{(l)}$

$(A^{-1})^T$

$(A^{-1})^T$

This is how we cite

[DBLP:journals/corr/abs-2006-04064]

## 1.0.1 DropOut

[Srivastava2014]

Dropout randomly removes output elements of its previous hidden layer  $H^{(l)}$  based on independent bernoulli random draws with a constant success rate at each training iteration.

This can be formulated as follows:  $H^{(l+1)} = \sigma(\mathfrak{N}(A)(Z^{(l)} \odot H^{(l)}))$

Where  $Z^{(l)}$  is

” *Speech 100*

— Olga Yakobson  
(Ph.Neutral)

### 2.1 Related Work Section 1

Graph Neural Networks have been around for quite a while and have proven very successful in modeling of various graph-related tasks. Such tasks require dealing with graph data which contains rich relation information among elements.

Therefore graph reasoning models, such as those of learning tasks require dealing with graph data which contains rich relation information among elements. Modeling physics systems, learning molecular fingerprints, predicting protein interface, and classifying diseases demand a model to learn from graph inputs. In other domains such as learning from non-structural data like texts and images, reasoning on extracted structures (like the dependency trees of sentences and the scene graphs of images) is an important research topic which also needs graph reasoning models. Graph neural networks (GNNs) are neural models that capture the dependence of graphs via message passing between the nodes of graphs. In recent years, variants of GNNs such as graph convolutional network (GCN), graph attention network (GAT), graph recurrent network (GRN) have demonstrated ground-breaking performances on many deep learning tasks. In this survey, we propose a general design pipeline for GNN models and discuss the variants of each component, systematically categorize the applications, and propose four open problems for future research.

## 2.2 Related Work Section 2

## 2.3 Related Work Section 3

## 2.4 Conclusion

” *Innovation distinguishes between a leader and a follower.*

— **Steve Jobs**  
(CEO Apple Inc.)

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## 3.1 System Section 1

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**Fig. 3.1:** Figure example: (a) example part one, (c) example part two; (c) example part three

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## 3.2 System Section 2

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**Fig. 3.2:** Another Figure example: (a) example part one, (c) example part two; (c) example part three

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### 3.3 System Section 3

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## 3.4 Conclusion

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Concepts: This text is here to  
test a very long title, to  
simulate the line break  
behavior, to show that an  
extremely long title also works

” *Users do not care about what is inside the box,  
as long as the box does what they need done.*

— **Jef Raskin**

about Human Computer Interfaces

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## 4.1 Concepts Section 1

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## 4.2 Concepts Section 2

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## 4.3 Concepts Section 3

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## 4.4 Conclusion

And after the second paragraph follows the third paragraph. Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. If you read this text, you will get no information. Really? Is there no information? Is there a difference between this text and some nonsense like “Huardest gefburn”? Kjift – not at all! A blind text like this gives you information about the selected font, how the letters are written and an impression of the look. This text should contain all letters of the alphabet and it should be written in of the original language. There is no need for special content, but the length of words should match the language.

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## Conclusion

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### 5.1 System Section 1

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## 5.2 System Section 2

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## 5.3 Future Work

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## Intro

This is a test chapter  $\frac{abc}{xyz}$

This is out of line

$$\frac{abc}{xyz}$$

$$\sum \frac{abc}{xyz} \tag{6.1}$$

$$\frac{abc}{xyz} \tag{6.2}$$

$$\sum \frac{abc}{xyz}$$

## 6.1 Theoretcal Foundations

This is a section ?? ??This is another section

graph convolutional network Graph convolutional network





## Example Appendix

This is the second paragraph. Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. If you read this text, you will get no information. Really? Is there no information? Is there a difference between this text and some nonsense like “Huardest gefburn”? Kjift – not at all! A blind text like this gives you information about the selected font, how the letters are written and an impression of the look. This text should contain all letters of the alphabet and it should be written in of the original language. There is no need for special content, but the length of words should match the language.

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Alpha	Beta	Gamma
0	1	2
3	4	5

**Tab. A.1:** This is a caption text.

## A.2 Appendix Section 2

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**Tab. A.2:** This is a caption text.

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## List of Figures



## List of Tables



## Colophon

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# Declaration

You can put your declaration here, to declare that you have completed your work solely and only with the help of the references you mentioned.

*Munich, February 4, 2022*

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Olga Yakobson

