

國立交通大學

資訊科學與工程研究所

碩士論文

基於卷積神經網路的論文自動生成技術

A CNN-based Automatic Thesis Generation Technique



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中華民國 106 年 9 月

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摘 要

在大 AI、ML 時代，自己寫論文已經不再是個有效率的做法，因此我們提出了一套基於卷積神經網路的論文自動生成技術。

關鍵字：卷積神經網路、機器學習



A CNN-based Automatic Thesis Generation Technique

Student : Ta-Ming Wang

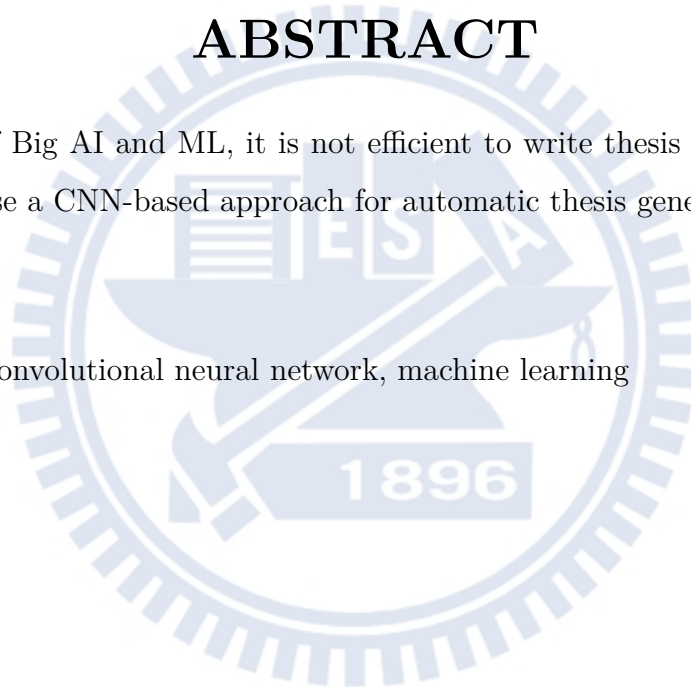
Advisor : Dr. Xiao-Sung Wu

Institute of Computer Science and Engineering
National Chiao Tung University

ABSTRACT

In the era of Big AI and ML, it is not efficient to write thesis by yourself anymore so that we propose a CNN-based approach for automatic thesis generation.

Keywords: convolutional neural network, machine learning

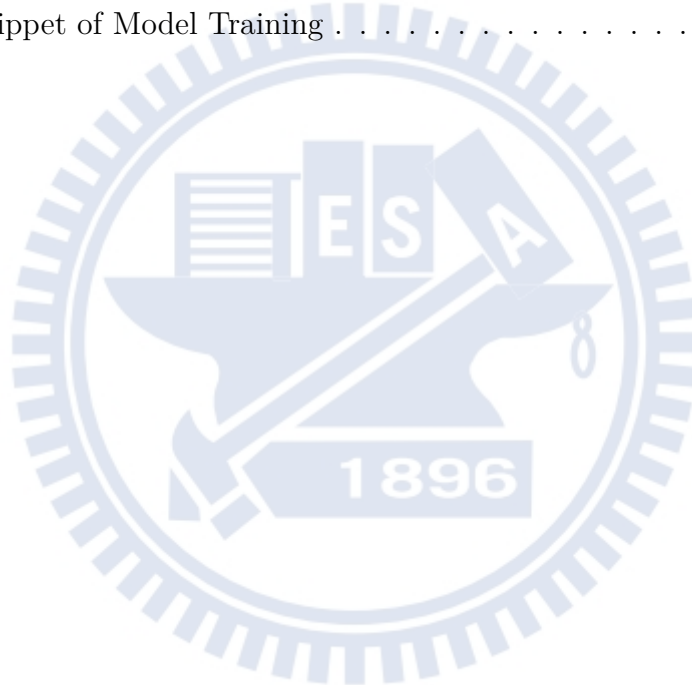


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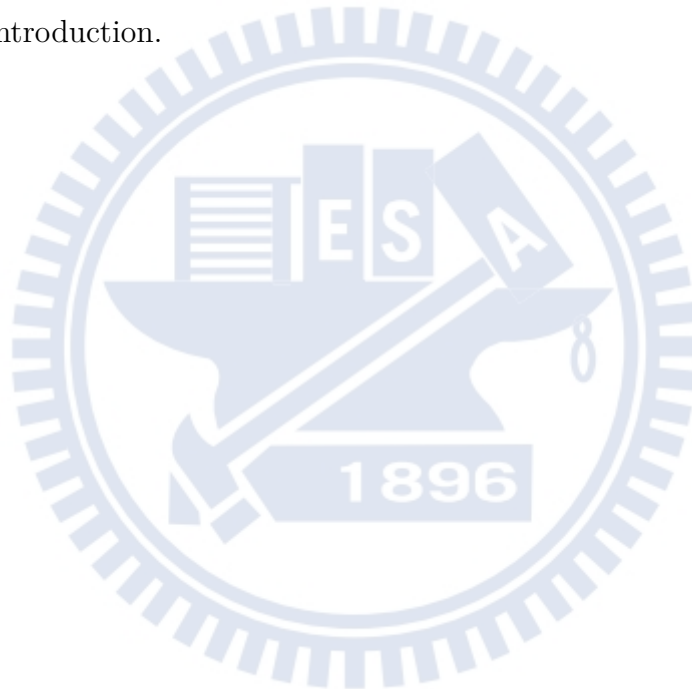
1	Training Time	5
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Chapter 1

Introduction

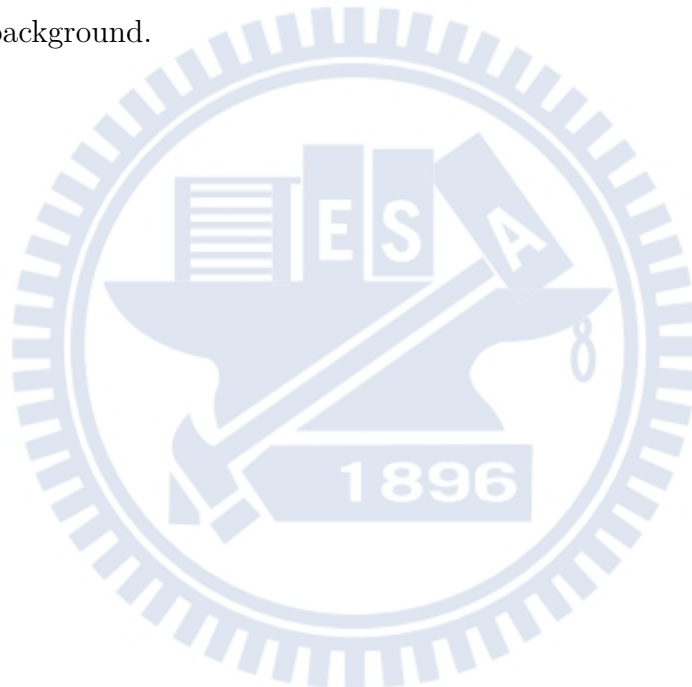
Here is the introduction.



Chapter 2

Background

Here is the background.



Chapter 3

Design

Here is the design.

3.1 Feature Extraction

3.2 Thesis Modeling

3.3 Thesis Generation

Algorithm 1 Get Maximum of Two Numbers

```
1: procedure GETMAXIMUM( $a, b$ )  
2:   if  $a \geq b$  then  
3:     return  $a$   
4:   else  
5:     return  $b$ 
```

Figure 1: Pseudo Code of GetMaximum

Chapter 4

Implementation



Figure 2: TensorFlow's Logo

We implement the prototype on TensorFlow[1] platform. Figure 2 shows the logo of TensorFlow, and Figure 3 shows the code snippet of model training.

```
import tensorflow as tf

def train(total_loss, global_step):
    # Variables that affect learning rate.
    num_batches_per_epoch = NUM_EXAMPLES_PER_EPOCH / FLAGS.batch_size
    decay_steps = int(num_batches_per_epoch * NUM_EPOCHS_PER_DECAY)

    # Decay the learning rate exponentially.
    lr = tf.train.exponential_decay(INITIAL_LEARNING_RATE,
                                    global_step,
                                    decay_steps,
                                    LEARNING_RATE_DECAY_FACTOR,
                                    staircase=True)
    tf.summary.scalar('learning_rate', lr)
```

Figure 3: Code Snippet of Model Training

Chapter 5

Evaluation

Here is the evaluation.

5.1 Datasets

5.2 Experiment Design

5.3 Experimental Results

5.3.1 Training Time

Table 1 lists the training time of different datasets.

Table 1: Training Time

Dataset	Training Time
A	1 hour
B	2 hours
C	3 hours
D	4 hours
E	5 hours

5.3.2 Example of Generated Thesis

Chapter 6

Related Work

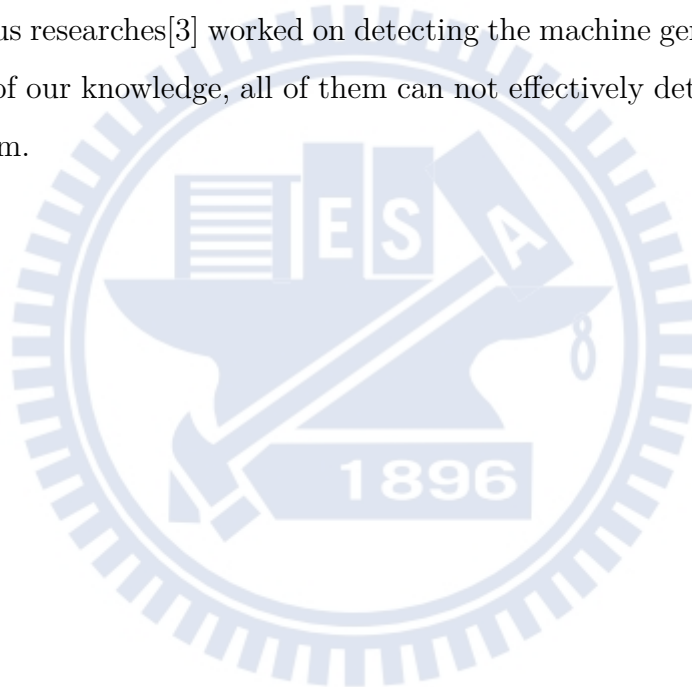
Here are the related works[2].



Chapter 7

Discussion

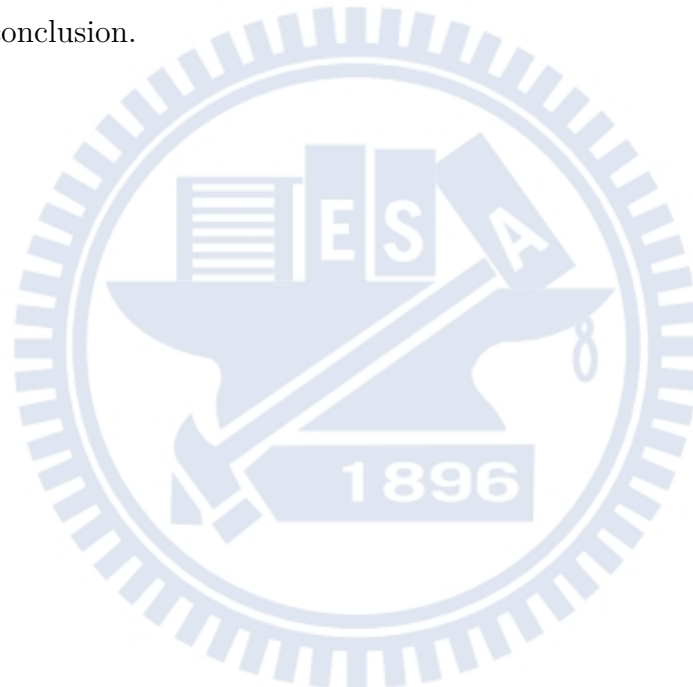
Some previous researches[3] worked on detecting the machine generated paper. However, to the best of our knowledge, all of them can not effectively detect the thesis generated by our system.



Chapter 8

Conclusion

Here is the conclusion.



References

- [1] *TensorFlow*. URL: <https://pdos.csail.mit.edu/archive/scigen/>.
- [2] MIT CSAIL. *SCIgen - An Automatic CS Paper Generator*. URL: <https://pdos.csail.mit.edu/archive/scigen/>.
- [3] Jiping Xiong and Tao Huang. “An effective method to identify machine automatically generated paper”. In: *Knowledge Engineering and Software Engineering, 2009. KESE'09. Pacific-Asia Conference on*. IEEE. 2009, pp. 101–102.

