Master's Thesis

Thesis Title

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Contents

1 Introduction

This is a LaTeX format template intended for use in Master's theses at the Graduate School of Advanced Science and Engineering, Information Sciences Program, Hiroshima University. The chapter and section structure is tentative; please modify it according to your content. Do not modify font sizes or line spacing as these changes may disrupt the layout.

When citing previous literature in the text, use the `\cite` command. Use the citation key listed in the reference list, writing it as:
"`...a method has been proposed based on~\cite{Furui2019-bz}.`" (The `~` prevents the citation symbol from being separated to the next line).

By labeling figures and equations using the `\label{label_name}` command, you can easily retrieve figure or equation numbers in the text by writing `\ref{label}`. For example, a figure labeled with `\label{fig:method}` can be cited as
"`The proposed method is shown in Fig.~\ref{fig:method}`", and an equation labeled with `\label{eq:model}` can be cited as
"`As shown in equation (\ref{eq:model})...`". Avoid manually typing figure or equation numbers.

Various other LaTeX command examples are provided in the following chapters for reference. Note that figures (illustrations and graphs) should be prepared as PDF files. The method for inserting figure files is described in Chapter 3.

In the following, Chapter 2 describes a methodology and various closely related existing methods. Chapter 3 explains the proposed XX, and Chapter 4 describes the experimental method, results, and discussion. Finally, Chapter 5 presents the conclusions and future work.

2 Related Work

This chapter organizes related research concerning XX from various perspectives.

2.1 Methods Based on XX

Traditionally, various approaches have been taken to achieve XX. In particular, the XX method [1] deals with YY and can be expressed by the following equation:

$$\hat{\theta} = \arg\min_{\theta \in \mathcal{S}} \mathcal{J}(\theta). \tag{1}$$

However, as shown in equation (1), this approach has limitations in terms of ZZ. The proposed method resolves this issue by taking an approach based on AA.

2.2 Methods Based on YY

Meanwhile, approaches based on BB have also been proposed as methods to improve CC. Among these, the XX method [2] enables DD.

However, this method also has limitations due to EE and faces constraints in FF. In contrast, the proposed method enables GG by implementing HH.

3 Proposed Method

Fig. 1 shows an overview of the proposed method. The proposed method enables XX by utilizing YY.

3.1 Model Structure

For a D-dimensional input vector $\mathbf{x} \in \mathbb{R}^D$, the structure of the proposed method is expressed by the following equation:

$$p(\mathbf{x}) = \int p(\mathbf{x}|\boldsymbol{\mu}, u\boldsymbol{\Sigma})p(u)\mathrm{d}u, \tag{2}$$

where $\boldsymbol{\mu} \in \mathbb{R}^D$ is the mean vector, $\boldsymbol{\Sigma} \in \mathbb{R}^{D\times D}$ is the covariance matrix, and $u \in \mathbb{R}^+$ represents the scale factor.

3.2 Inference Method

The proposed method enables inference through XX.

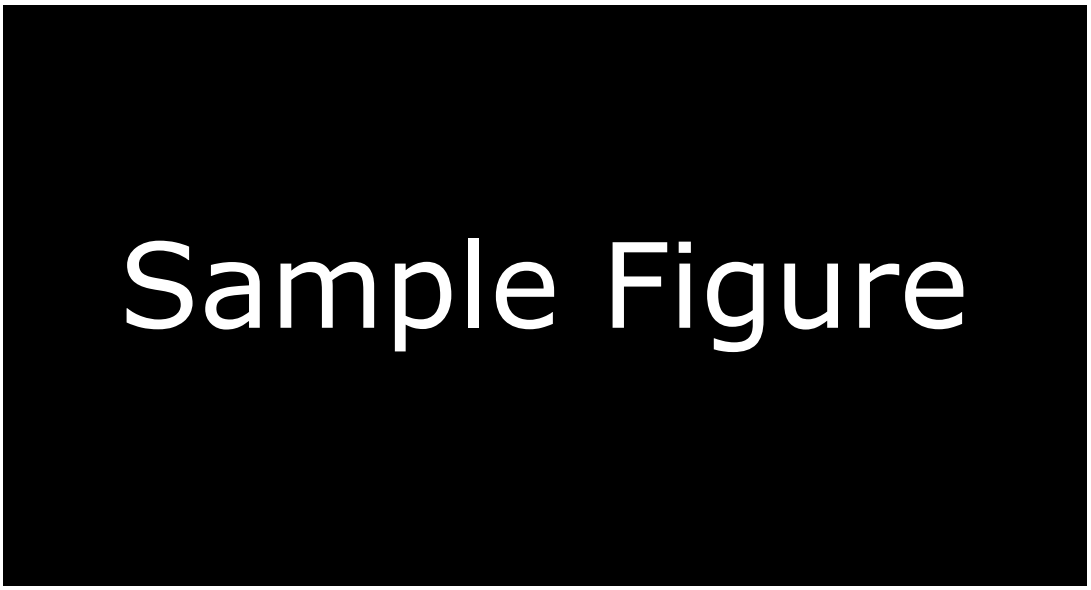

Fig. 1. Sample figure.

3.3 Learning Algorithm

The learning algorithm for the proposed method is as follows:

4 Experiments

4.1 Experimental Method

We conducted experiments to evaluate XX.

4.2 Results

The experimental results are presented using figures and tables. Table 1 shows an example table.

4.3 Discussion

Here we discuss the obtained results.

Table 1. Performance evaluation

Model	Accuracy	Sensitivity	Specificity	AUC-ROC
Baseline #1	0.578	XXXX	XXXX	XXXX
Baseline #2	0.622	XXXX	XXXX	XXXX
Ours	0.751	XXXX	XXXX	XXXX

5 Conclusion

In this thesis, we presented XX based on the YY method. In particular, we demonstrated that ZZ is achievable through AA.

In our experiments, we conducted BB to evaluate CC. The results indicated DD, suggesting the potential for EE.

Future work should focus on improving FF.

Acknowledgement

The following acknowledgments are provided as an example only. While you may use this as a reference, you should express your gratitude in your own words to those who deserve recognition (avoid using the exact wording from this example).

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References

[1] A. Furui, S. Eto, K. Nakagaki, K. Shimada, G. Nakamura, A. Masuda, T. Chin, and T. Tsuji, "A myoelectric prosthetic hand with muscle synergy-based motion determination and impedance model-based biomimetic control," *Science Robotics*, vol. 4, no. 31, pp. eaaw6339, 2019.

[2] A. Furui, T. Igaue, and T. Tsuji, "EMG pattern recognition via Bayesian inference with scale mixture-based stochastic generative models," *Expert Systems with Applications*, vol. 185, pp. 115644, 2021.

A Derivation of Something

The derivation of XX in the proposed method is presented.