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實用防禦魔法及其對抗黑魔法之使用

Practical Defensive Magic and Its Use Against the Dark Arts

哈利·詹姆·波特
Harry James Potter

指導教授：
鄧不利多 博士、麥米奈娃 博士

Advisors:
Albus Dumbledore, Ph.D.
Minerva Mcgonagall, Ph.D.

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Practical Defensive Magic and Its Use Against the Dark Arts

本論文係哈利·詹姆·波特君 (R12345678) 在國立臺灣大學經濟學系完成之碩士學位論文，於民國 106 年 7 月 24 日承下列考試委員審查通過及口試及格，特此證明

口試委員：

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謝辭

「勇氣有很多種」鄧不利多笑著說道。「我們需要非常大的勇氣，才能站起來反抗我們的敵人；但要反抗我們的朋友，同樣也需要非凡的勇氣才能做到。」

—《哈利波特：神秘的魔法石》

Acknowledgements

"There are all kinds of courage," said Dumbledore, smiling. "It takes a great deal of bravery to stand up to our enemies, but just as much to stand up to our friends." — *Harry Potter and the Sorcerer's Stone*

摘要

世界不會分好人和壞人，每個人內心都有光明和黑暗，真正重要的是我們如何選擇，知道我們究竟是什麼人。—《哈利波特：鳳凰會的密令》

關鍵詞：黑魔法防禦術、正氣師、催狂魔、佛地魔。

JEL 分類代號：D72、L82、D83、C81。

Abstract

We've all got both light and dark inside us. What matters is the part we choose to act on. That's who we really are. — *Harry Potter and the Order of the Phoenix*

Keywords: Defense Against the Dark Arts, auror, dementor, Voldemort.

JEL Classification: D72, L82, D83, C81.

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Chapter 1

Introduction

It is our choices, Harry, that show what we truly are, far more than our abilities.

— Albus Percival Wulfric Brian Dumbledore

This is an X∃LATEXtemplate for typesetting thesis in the social sciences in National Taiwan University. The original document is created by Tz-Huan Huang. This version is amended by Keng-Chi Chang to meet some conventions in the social sciences (especially economics) and to improve the ease of editing and reading. [1]

This template proceeds as follows: Section 2.1 contains some citations. Section 3.1 shows some equations. Section 4.1 imports a table. Section 5.1 includes a figure. Section 6.1 demonstrates the use of todo notes, and finally concludes.

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[1] If you find any problems or come up with any suggestions, please feel free to email me.

Chapter 2

Literature Review

2.1 Citation Example

This section showcases some citations under common scenarios.

Bonica (2014); Donoho (2015); Meyersson (2014); Akerlof and Kranton (2000); Bond and Messing (2015); Broockman and Kalla (2016); Nunn and Wantchekon (2011); Gentzkow et al. (2017); Hastie et al. (2009); Chetty et al. (2017); National Opinion Research Center (2017); Pew Research Center (2016); The New York Times (2016).

Chapter 3

Model and Method

3.1 Equation Example

Here is Equation 3.1.

$$\mathcal{L}\left(\boldsymbol{\theta}, \boldsymbol{\phi}, \boldsymbol{\alpha}, \boldsymbol{\beta}, \gamma \mid \mathbf{y}\right) = \prod_{i \in \text{user}} \prod_{j \in \text{page}} \text{logit}^{-1}\left(\pi_{ij}\right)^{y_{ij}} \left(1 - \text{logit}^{-1}\left(\pi_{ij}\right)\right)^{1 - y_{ij}},$$

$$\left\{\hat{\boldsymbol{\theta}}, \hat{\boldsymbol{\phi}}\right\} = \arg\max_{\boldsymbol{\theta}, \boldsymbol{\phi}} \mathcal{L}\left(\boldsymbol{\theta}, \boldsymbol{\phi}, \boldsymbol{\alpha}, \boldsymbol{\beta}, \gamma \mid \mathbf{y}\right),$$

(3.1)

where $\pi_{ij} = \alpha_i + \beta_j - \gamma \left\| \theta_i - \phi_j \right\|^2$.

Chapter 4

Data Processing and Results

4.1 Table Example

Table 1 is an affiliation matrix.

Table 1: Affiliation Matrix (Part)

	Trump	FoxNews	TeaParty	Clinton	CNN	NYTimes
Trump	2,243,216	1,078,513	128,225	32,731	120,963	25,842
FoxNews	1,078,513	2,449,174	148,016	87,084	186,850	63,401
TeaParty	128,225	148,016	242,089	1528	10,738	2162
Clinton	32,731	87,084	1528	1,768,980	351,210	367,021
CNN	120,963	186,850	10,738	351,210	1,201,156	216,163
NYTimes	25,842	63,401	2162	367,021	216,163	986,613

Notes: Diagonal numbers are unique US users like at least one post of each pages, off-diagonal numbers are shared unique US users at least one post in both pages. Data ranges from 2015-01-01 to 2016-11-07. US users are defined by any user that at least reacted to any national politicians' (Sen, Rep, Gov) post once in 2015 and 2016.

Chapter 5

Validations

5.1 Figure Example

Figure 1 shows party affiliations of users on media fan pages against our esti-mate.
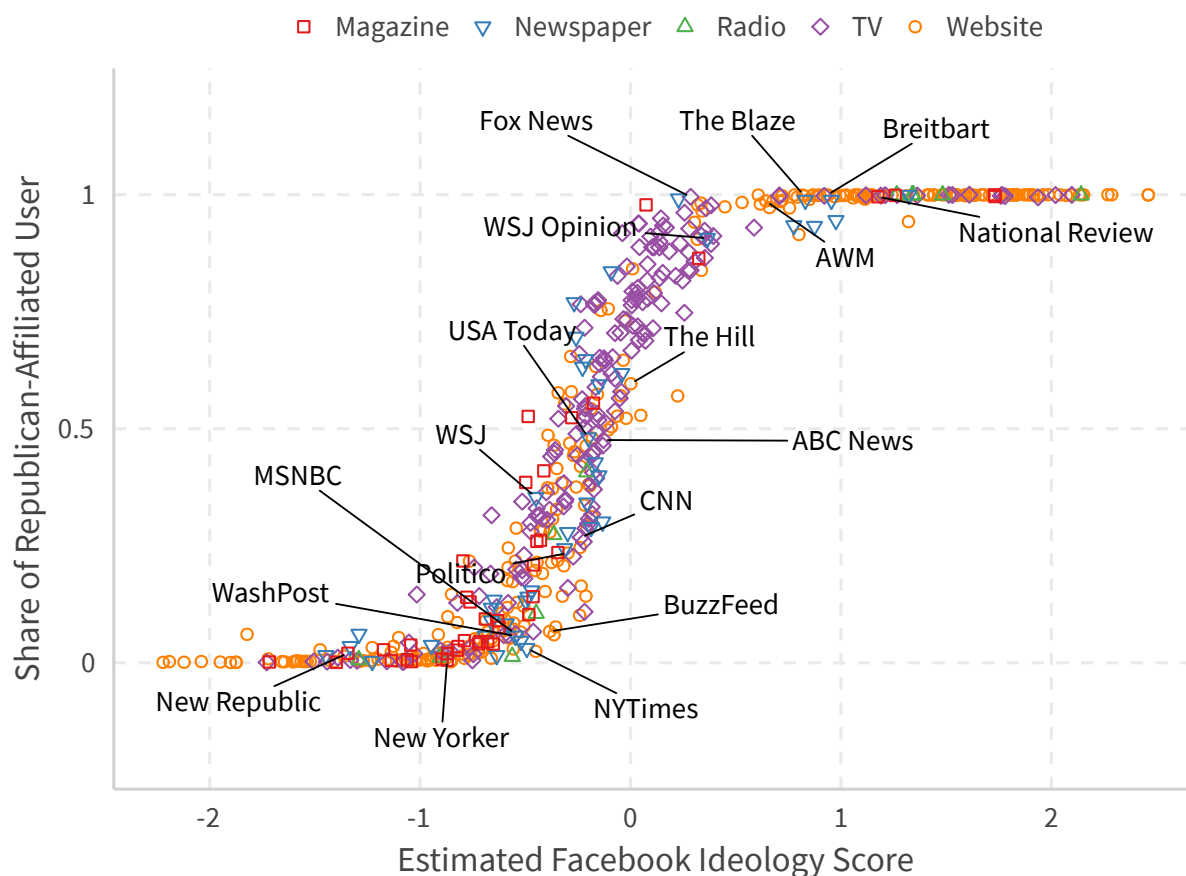
Figure 1: Validation of Media Slant

Notes: A user is *Republican-affiliated* if their likes in all politicians are more for Republicans. We only count user once a day on a page if they like more than one post on that day on that page. We then sum all this kind of daily users up across each day. Data ranges from 2015-01-01 to 2017-03-31.

Chapter 6

Applications and Discussions

6.1 Todo Example

Hello, I'm Rita Skeeter! I write for the Daily Prophet. But, of course, you know Nonsense
that, don't you? It's you we don't know. You're the juicy news. [1]

> **Missing figure** Make a sketch of the Marauder's Map.

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[1] If you don't want to show a Todo List at the end of the document, simply comment out the "Todo List" part in `thesis.tex`. For more usage, please see the todonotes package.

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https : / / www . nytimes . com / interactive / 2016 / upshot / presidential - polls -
forecast.html.

Appendix A

Further Results

Dumbledore: "It does not to do dwell on dreams, and forget to live."

Appendix B

Further Validations

Hermione: "Me? Books and cleverness. There are more important things: friendship and bravery."

Todo List