How to Write Your Thesis

Yu Kai Huang
Basic Concept of Research

- Knowledge
- Comprehension
- Application
- Analysis
- Synthesis
- Evaluation

Model

Variable

Relationship

\[ E = mc^2 \]

\[ F = \frac{g \cdot m_1 \cdot m_2}{r^2} \]
Basic Concept of Research

![Graphs and images related to research concepts]
Basic Concept of Research

- 床前明月光，疑是地上霜
- 郎騎竹馬來，繞床弄青梅
Basic Concept of Research

- Decision
- Prediction
- Build Theory
- Build Model
- Hypothesis
- Performance
- Simulation
- Time-Series
- Optimization
- Classification

Qualitative Research
- Case Study
- MCDM (Fuzzy AHP, TOPSIS)
- Content Analysis
- FCM

Quantitative Research
- ANOVA (SEM)
- Logit Model and Game Theory
- DEA
- Data Mining
- Chaos and Catastrophe
Research Method (Discovery a Research)
Research Method (MCDM)

<table>
<thead>
<tr>
<th>Goal</th>
<th>Objective</th>
<th>Criteria</th>
<th>Weights</th>
<th>Alternative</th>
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</thead>
<tbody>
<tr>
<td>Evaluation of retailing delivery service quality</td>
<td>Doorsill factor of the RD system</td>
<td>System complexity</td>
<td>0.1514 (4)</td>
<td>CVS.com</td>
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<tr>
<td></td>
<td></td>
<td>Extra investment</td>
<td>0.2042 (3)</td>
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<tr>
<td></td>
<td></td>
<td>Delivery cost</td>
<td>0.4398 (1)</td>
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<tr>
<td></td>
<td></td>
<td>Fixed cost</td>
<td>0.2045 (2)</td>
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<td></td>
<td>Friendly of e-map mechanism</td>
<td>0.1943 (3)</td>
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<td></td>
<td>Accurate information of e-map</td>
<td>0.4397 (1)</td>
<td>7-11.com</td>
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<td>A limiting factor of the size of goods</td>
<td>0.0962 (4)</td>
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<td>Convenient operation procedure</td>
<td>0.2698 (2)</td>
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<td></td>
<td></td>
<td>Service quality of clerk</td>
<td>0.1468 (4)</td>
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<td>Reliable delivery</td>
<td>0.3506 (1)</td>
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<td>Return delivery</td>
<td>0.1659 (3)</td>
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<td>Follow-up service when delivered damaged</td>
<td>0.3367 (2)</td>
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<td>Timely information</td>
<td>0.1724 (4)</td>
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<tr>
<td></td>
<td></td>
<td>Accurate information</td>
<td>0.3408 (1)</td>
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<td></td>
<td></td>
<td>A note of pick-up good by cell phone</td>
<td>0.2473 (2)</td>
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<td></td>
<td>E-tracking mechanism</td>
<td>0.2396 (3)</td>
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<td>Operation procedure</td>
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<tr>
<td></td>
<td>Information system</td>
<td></td>
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</table>
Research Method (FCM)

3. Construction of FCMs - Constructed FCM

- Directional arcs shown by the dots will be activated if certain conditions are reached.

Number of nodes + input data
Research Method (SEM)
## Research Method (Logit Model)

\[ U_{in} = X_{in} \beta + X_{in}^* \beta _X^* + \varepsilon_{in}, \varepsilon_{in} \sim Gumbel(0, \mu) \]

<table>
<thead>
<tr>
<th></th>
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<th>CVS</th>
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<td><strong>Base</strong></td>
<td>61.547%</td>
<td>38.543%</td>
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<td><strong>7-11</strong></td>
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<tr>
<td>Delivery charge+10%</td>
<td>59.553%(-1.994%)</td>
<td>40.447 %(+1.994%)</td>
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<tr>
<td>Delivery charge+30%</td>
<td>55.500%(-6.047%)</td>
<td>44.500 %(+6.047%)</td>
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<tr>
<td>Delivery charge-10%</td>
<td>63.495%(+1.948%)</td>
<td>36.505%(-1.948%)</td>
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<tr>
<td>Delivery charge-30%</td>
<td>67.195%(+5.648%)</td>
<td>32.805%(-5.648%)</td>
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<tr>
<td>SQ2+1 grade</td>
<td>78.749%(+17.201%)</td>
<td>21.341%(-17.201%)</td>
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<tr>
<td>SQ3+1 grade</td>
<td>95.793%(+34.246%)</td>
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<tr>
<td><strong>CVS</strong></td>
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<tr>
<td>Delivery charge+10%</td>
<td>63.578%(+2.031%)</td>
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<tr>
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<tr>
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<tr>
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<tr>
<td>SQ3+1 grade</td>
<td>25.601%(-35.946%)</td>
<td>74.489%(+35.946%)</td>
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Research Method (Data Mining)
Research Method (Chaos)

- Chaos theory finding the order in what appears to be completely random data.

- A chaotic analysis is a tool of the research of complex behavior that seems random but actually has some hidden order.
Fitting the CCM can be determined by fitting the probability density function:

State Variable: $x$

Normal Factor: $v$

Splitting Factor: $u$

The equation for the probability density function is:

$$f^* = k \cdot \exp\left(\frac{1}{4} x^4 - \frac{1}{2} u x^2 - v x\right)$$
Research Method (Bayesian Network)

A Bayesian Network (BN) is a probability-based knowledge representation method, which is appropriate for the modeling of causal processes with uncertainty.

\[ P(X_1, X_2, \ldots, X_n \mid e) = \frac{P(X_1, X_2, \ldots, X_n, e)}{P(e)} \]
How to discovery your thesis

- What?
- Why?
- How?
- What is new?

Key Element
- Problem or Hypothesis
- Data and Method
- Analyze and Explain
Conference and Journal Paper

Format

- Abstract
- Introduction
- Literature Review
- Method
- Data and Results
- Discussion
- Conclusion
- References
The following websites are proposed readable for your scholar

- Google scholar

- Chinese Electronic Periodical Service

- SSCI,SCI

- Call for Paper
  - [http://www.papersinvited.com/](http://www.papersinvited.com/)

- Others
  - [http://www.yomiuri.co.jp/](http://www.yomiuri.co.jp/)
Impossible  ➡️ I’m possible

- 你不一定可以成為第一，但是可以是讓自己是唯一
- 成功的人找方法，失敗的人找藉口
- 方法永遠比問題多
- 成功來自幸運也帶來義務

你認識你自己嗎？

- 委（你）的履歷表
  - 學歷
  - 經歷
  - 興趣