

Notes During PhD

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This document is an ongoing collection of my writing during my PhD.
Inspired by the Tufte-Handout Style ¹, this handout is built using
tufte-latex².

¹ Edward R. Tufte!

² <https://github.com/Tufte-LaTeX/tufte-latex>

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General Topics to Explore

Priority from high to low

- Exponential Family and Duality
- General Linear Model, Logistics Model
- Multiple Testing
- Stein's Method
- Approximation Theory (Neural Network Model)
The gap between Barron's Space and Fourier Space

L^AT_EX Project Management

The goal is to have a consistent boilerplate for L^AT_EX projects, I choose AOS for regular article.³

³ <https://vtex-soft.github.io/texsupport.ims-aos/>

- chapters/01-*.tex: individual files
- fig: figures to reproduce
 - External figures by R or Python, $DPS \geq 300$, .pdf
 - TikZ: .tex and .pdf
 - Asymptote: .asy and .pdf

Below is an example project hosted on Github or Overleaf:

```

| chapters
|   | 01-preface.tex
|   | 02-intro.tex
| fig
|   | hilbertrecursive.tex
|   | hilbertrecurses.pdf
|   | helix.asy
|   | helix.pdf
| latexmkrc
| main.bib
| main.pdf
| main.tex
| tex
| macro.tex
| tufte-book.cls
| tufte-common.def
| tufte-handout.cls
| tufte.bst

```

Mathematical Notation

It has always been a hassle to organise mathematical notation across different sources, in fact, I would go so far as to argue that it is the most annoying thing when one starts reading a book or an article.

However, there *must be* some notational conflicts beyond primary school simply due to the fact that the limited number of alphabets (26). For example, “ E ” might be energy in physics while it could refer to expectation or scores in probability.

Another difficulty is that the authors often assume some familiarity in the topics *also* I am expected to read in some logical or chronological order. In reality, I am constantly jumping back and forth between one literature to another.

Symbol	Context	Meaning
\mathbb{Z}		set of integers
\mathbb{R}		set of real numbers $(-\infty, \infty)$

References