上海交通大學

SHANGHAI JIAO TONG UNIVERSITY

学士学位论文

BACHELOR'S THESIS

论文题目：中文标题

学生姓名：某某

学生学号：0010900990

专　　业：某某专业

指导教师：某某教授

学院 (系)：Your affiliation

English Title

ABSTRACT

An imperial edict issued in 1896 by Emperor Guangxu, established Nanyang Public School in Shanghai. The normal school, school of foreign studies, middle school and a high school were established. Sheng Xuanhuai, the person responsible for proposing the idea to the emperor, became the first president and is regarded as the founder of the university.

During the 1930s, the university gained a reputation of nurturing top engineers. After the foundation of People's Republic, some faculties were transferred to other universities. A significant amount of its faculty were sent in 1956, by the national government, to Xi'an to help build up Xi'an Jiao Tong University in western China. Afterwards, the school was officially renamed Shanghai Jiao Tong University.

Since the reform and opening up policy in China, SJTU has taken the lead in management reform of institutions for higher education, regaining its vigor and vitality with an unprecedented momentum of growth. SJTU includes five beautiful campuses, Xuhui, Minhang, Luwan Qibao, and Fahua, taking up an area of about 3,225,833 m2. A number of disciplines have been advancing towards the top echelon internationally, and a batch of burgeoning branches of learning have taken an important position domestically.

Today SJTU has 31 schools (departments), 63 undergraduate programs, 250 masters-degree programs, 203 Ph.D. programs, 28 post-doctorate programs, and 11 state key laboratories and national engineering research centers.

SJTU boasts a large number of famous scientists and professors, including 35 academics of the Academy of Sciences and Academy of Engineering, 95 accredited professors and chair professors of the "Cheung Kong Scholars Program" and more than 2,000 professors and associate professors.

Its total enrollment of students amounts to 35,929, of which 1,564 are international students. There are 16,802 undergraduates, and 17,563 masters and Ph.D. candidates. After more than a century of operation, Jiao Tong University has inherited the old tradition of ”high starting points, solid foundation, strict requirements and extensive practice.” Students from SJTU have won top prizes in various competitions, including ACM International Collegiate Programming Contest, International Mathematical Contest in Modeling and Electronics Design Contests. Famous alumni include Jiang Zemin, Lu Dingyi, Ding Guangen, Wang Daohan, Qian Xuesen, Wu Wenjun, Zou Taofen, Mao Yisheng, Cai Er, Huang Yanpei, Shao Lizi, Wang An and many more. More than 200 of the academics of the Chinese Academy of Sciences and Chinese Academy of Engineering are alumni of Jiao Tong University.

KEY WORDS: SJTU, master thesis, XeTeX/LaTeX template

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Symbol

ϵ 介电常数

μ 磁导率

ϵ 介电常数

μ 磁导率

ϵ 介电常数

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μ 磁导率

Chapter 1　这是什么

这是上海交通大学 (非官方) 学位论文 LaTeX 模板，当前版本是 v0.9。

最早的一版学位模板是一位热心的物理系同学制作的。那份模板参考了自动化所学位论文模板，使用了 CASthesis.cls 文档类，中文字符处理则采用当时最为流行的 CJK–LaTeX 方案。我根据交大研究生院对学位论文的要求 [1] ，结合少量个人审美喜好，完成了一份基本可用的交大 LaTeX 学位论文模板。但是，搭建一个 CJK–LaTeX 环境并不简单，单单在 Linux 下配置环境和添加中文字体，就足够让新手打退堂鼓。在 William Wang 的建议下，我开始着手把模板向 XeLaTeX 引擎移植。他完成了最初的移植，多亏了他出色的工作，后续的改善工作也得以顺利进行。

随着我对 LaTeX 系统认知增加，我又断断续续做了一些完善模板的工作，在原有硕士学位论文模板的基础上完成了交大学士和博士学位论文模板。

现在，交大学位论文模板 SJTUTHesis 代码在 github [2] 上维护。你可以在 github 上开 issue 、或者在水源 LaTeX 版发帖来反映遇到的问题。

1.1　使用模板

1.1.1　准备工作

要使用这个模板撰写学位论文，需要在 *TeX 系统*、*中英文字体*、*TeX 技能*上有所准备。

- TeX 系统：所使用的 TeX 系统要支持 XeLaTeX 引擎，且带有 ctex 2.x 宏包，以 2015 年的完整 TeXLive、MacTeX 发行版为佳。
- 中英文字体：操作系统中需要安装[3]TeX Gyre Termes 字体[4]和四款 Adobe 中文字

[1] http://www.gs.sjtu.edu.cn/policy/fileShow.ahtml?id=130

[2] https://github.com/weijianwen/SJTUThesis

[3] 在 Windows、Mac OS X 以及 Linux 上安装额外的字体，可以参考“How to install fonts?”。

[4] http://www.gust.org.pl/projects/e-foundry/tex-gyre/termes

体[1]：AdobeSongStd、AdobeKaitiStd、AdobeHeitiStd、AdobeFangsongStd。

- TeX 技能：尽管提供了对模板的必要说明，但这不是一份“LaTeX 入门文档”。在使用前请先通读其他入门文档。
- 针对 Windows 用户的额外需求：学位论文模本分别使用 git 和 GNUMake 进行版本控制和构建，建议从 Cygwin[2]安装这两个工具。

1.1.2 模板选项

sjtuthesis 提供了一些常用选项，在 thesis.tex 在导入 sjtuthesis 模板类时，可以组合使用。这些选项包括：

- 学位类型：bachelor(学位)、master(硕士)、doctor(博士)，是必选项。
- 中国字体：adobefonts(Adobe 中文字体)、winfonts(使用 Windows 下的中文字体，该选项未在 Linux/Mac 下测试)。
- 正文字号：cs4size(小四)、c5size(五号)。
- 盲审选项：使用 review 选项后，论文作者、学号、导师姓名、致谢、发表论文和参与项目将被隐去。

1.1.3 编译模板

模板默认使用 GNUMake 构建，GNUMake 将调用 latemk 工具自动完成模板多轮编译：

Source Code 1.1: 编译模板

```
make clean thesis.pdf
```

若需要生成包含“原创性声明扫描件”的学位论文文档，请将扫描件保存为 statement.pdf，然后调用 make 生成 submit.pdf。

Source Code 1.2: 生成用于提交的学位论文

```
make clean submit.pdf
```

[1]请从合法渠道获得 Adobe 字体。

[2]http://cygwin.com

编译失败时，可以尝试手动逐次编译，定位故障。

Source Code 1.3: 手动逐次编译

```
xelatex -no-pdf thesis
biber --debug thesis
xelatex thesis
xelatex thesis
```

1.1.4 模板文件布局

本节介绍学位论文模板中木要文件和目录的功能。

1.1.4.1 格式控制文件

格式控制文件控制着论文的表现形式，包括以下几个文件：sjtuthesis.cfg, sjtuthesis.cls 和 GBT7714-2005NLang.bst。其中，“cfg”和“cls”控制论文主体格式，“bst”控制参考文献条目的格式，

1.1.4.2 主控文件 thesis.tex

主控文件 thesis.tex 的作用就是将你分散在多个文件中的内容“整合”成一篇完整的论文。使用这个模板撰写学位论文时，你的学位论文内容和素材会被“拆散”到各个文件中：譬如各章正文、各个附录、各章参考文献等等。在 thesis.tex 中通过“include”命令将论文的各个部分包含进来，从而形成一篇结构完成的论文。对模板定制时引入的宏包，建议放在导言区。

1.1.4.3 各章源文件 tex

这一部分是论文的主体，是以“章”为单位划分的，包括：

- 中英文摘要 (abstract.tex)。前言 (frontmatter) 的其他部分，中英文封面、原创性声明、授权信息在 sjtuthesis.cls 中定义，不单独分离为 tex 文件。不单独弄成文件。
- 正文 (mainmatter)——学位论文正文的各章内容，源文件是 chapter*xxx*.tex。

Source Code 1.4: 模板文件布局

```
LICENSE
Makefile
README.md
bib
    chap1.bib
    chap2.bib
bst
    GBT7714-2005NLang.bst
figure
    chap2
        sjtulogo.eps
        sjtulogo.jpg
        sjtulogo.pdf
        sjtulogo.png
    sjtubanner.png
sjtuthesis.cfg
sjtuthesis.cls
statement.pdf
submit.pdf
tex
    abstract.tex
    ack.tex
    app_cjk.tex
    app_eq.tex
    app_log.tex
    chapter01.tex
    chapter02.tex
    chapter03.tex
    conclusion.tex
    id.tex
    patents.tex
    projects.tex
    pub.tex
    symbol.tex
thesis.tex
```

- 附录 (app*xx*.tex)、致谢 (thuanks.tex)、攻读学位论文期间发表的学术论文目录 (pub.tex)、个人简历 (resume.tex) 组成正文后的部分 (backmatter)。参考文献列表由 bibtex 插入，不作为一个单独的文件。

1.1.4.4 图片文件夹 figure

figure 文件夹放置了需要插入文档中的图片文件 (支持 PNG/JPG/PDF/EPS 格式的图片)，可以在按照章节划分子目录。模板文件中使用`\graphicspath` 命令定义了图片存储的顶层目录，在插入图片时，顶层目录名“figure”可省略。

1.1.4.5 参考文献数据库 bib

目前参考文件数据库目录只存放一个参考文件数据库 thesis.bib。关于参考文献引用，可参考第Chapter 2章中的例子。

Chapter 2 LaTeXExample

2.1 Lists

2.1.1 Unordered List

The aperture was black with a darkness almost material. That tenebrousness was indeed a positive quality; for it obscured such parts of the inner walls as ought to have been revealed, and actually burst forth like smoke from its aeon-long imprisonment, visibly darkening the sun as it slunk away into the shrunken and gibbous sky on flapping membraneous wings. The odour rising from the newly opened depths was intolerable, and at length the quick-eared Hawkins thought he heard a nasty, slopping sound down there. Everyone listened, and everyone was listening still when It lumbered slobberingly into sight and gropingly squeezed Its gelatinous green immensity through the black doorway into the tainted outside air of that poison city of madness.

- Ph'nglui mglw'nafh Cthulhu R'lyeh wgah'nagl fhtagn.
- Ph'nglui mglw'nafh Cthulhu R'lyeh wgah'nagl fhtagn.
- Ph'nglui mglw'nafh Cthulhu R'lyeh wgah'nagl fhtagn.

The odour rising from the newly opened depths was intolerable, and at length the quick-eared Hawkins thought he heard a nasty, slopping sound down there. Everyone listened, and everyone was listening still when It lumbered slobberingly into sight and gropingly squeezed Its gelatinous green immensity through the black doorway into the tainted outside air of that poison city of madness.

• Ph'nglui mglw'nafh Cthulhu R'lyeh wgah'nagl fhtagn. • Ph'nglui mglw'nafh Cthulhu R'lyeh wgah'nagl fhtagn.◦ • Ph'nglui mglw'nafh Cthulhu R'lyeh wgah'nagl fhtagn.

2.1.2 Ordered List

Poor Johansen's handwriting almost gave out when he wrote of this. Of the six men who never reached the ship, he thinks two perished of pure fright in that accursed instant. The Thing cannot be described - there is no language for such abysms of shrieking and immemorial lunacy, such eldritch contradictions of all matter, force, and cosmic order. A mountain walked or stumbled. God! What wonder that across the earth a great architect went mad, and poor Wilcox raved with fever in that telepathic instant? The Thing of the idols, the green, sticky spawn of the stars, had awaked to claim his own. The stars were right again, and what an age-old cult had failed to do by design, a band of innocent sailors had done by accident. After vigintillions of years great Cthulhu was loose again, and ravening for delight.

1. Ph'nglui mglw'nafh Cthulhu R'lyeh wgah'nagl fhtagn.
2. Ph'nglui mglw'nafh Cthulhu R'lyeh wgah'nagl fhtagn.
3. Ph'nglui mglw'nafh Cthulhu R'lyeh wgah'nagl fhtagn.

A mountain walked or stumbled. God! What wonder that across the earth a great architect went mad, and poor Wilcox raved with fever in that telepathic instant? The Thing of the idols, the green, sticky spawn of the stars, had awaked to claim his own. The stars were right again, and what an age-old cult had failed to do by design, a band of innocent sailors had done by accident. After vigintillions of years great Cthulhu was loose again, and ravening for delight.

1. Ph'nglui mglw'nafh Cthulhu R'lyeh wgah'nagl fhtagn. 2. Ph'nglui mglw'nafh Cthulhu R'lyeh wgah'nagl fhtagn. 3. Ph'nglui mglw'nafh Cthulhu R'lyeh wgah'nagl fhtagn.

2.1.3 Descriptive List

The stars were right again, and what an age-old cult had failed to do by design, a band of innocent sailors had done by accident. After vigintillions of years great Cthulhu was loose again, and ravening for delight.

theme 1 Ph'nglui mglw'nafh Cthulhu R'lyeh wgah'nagl fhtagn.

theme 2 Ph'nglui mglw'nafh Cthulhu R'lyeh wgah'nagl fhtagn.

theme 3 …

2.1.4 Customized List

Cthulhu still lives, too, I suppose, again in that chasm of stone which has shielded him since the sun was young. His accursed city is sunken once more, for the Vigilant sailed over the spot after the April storm; but his ministers on earth still bellow and prance and slay around idol-capped monoliths in lonely places. He must have been trapped by the sinking whilst within his black abyss, or else the world would by now be screaming with fright and frenzy. Who knows the end? What has risen may sink, and what has sunk may rise.

a) Ph'nglui mglw'nafh Cthulhu R'lyeh wgah'nagl fhtagn. *b)* Ph'nglui mglw'nafh Cthulhu R'lyeh wgah'nagl fhtagn. *c)* Ph'nglui mglw'nafh Cthulhu R'lyeh wgah'nagl fhtagn.

2.2 Math

2.2.1 Equations

Loathsomeness waits and dreams in the deep, and decay spreads over the tottering cities of men. A time will come - but I must not and cannot think! Let me pray that, if I do not survive this manuscript, my executors may put caution before audacity and see that it meets no other eye.

$$\frac{1}{2}\Delta(f_{ij}f^{ij}) = 2\left(\sum_{i<j}\chi_{ij}(\sigma_i-\sigma_j)^2 + f^{ij}\nabla_j\nabla_i(\Delta f) + \right.$$
$$\left. + \nabla_k f_{ij}\nabla^k f^{ij} + f^{ij}f^k\left[2\nabla_i R_{jk} - \nabla_k R_{ij}\right]\right) \quad (2\text{–}1)$$

Poor Johansen's handwriting almost gave out when he wrote of this. Of the six men who never reached the ship, he thinks two perished of pure fright in that accursed instant. The Thing cannot be described - there is no language for such abysms of shrieking and immemorial lunacy, such eldritch contradictions of all matter, force, and cosmic order.

2.2.1.1 A 4-th level subtitle

Cthulhu still lives, too, I suppose, again in that chasm of stone which has shielded him since the sun was young. His accursed city is sunken once more, for the Vigilant sailed over the spot after the April storm; but his ministers on earth still bellow and prance and slay around idol-capped monoliths in lonely places. He must have been trapped by the sinking whilst within his black abyss, or else the world would by now be screaming with fright and frenzy. Who knows the end? What has risen may sink, and what has sunk may rise.

$$A \underset{n=0}{\longleftarrow} B \xrightarrow[LongLongLongLong]{n>0} C$$

$$f(x) \quad \overset{A=B}{\longleftrightarrow} \quad B \tag{2–2}$$

$$\underset{below}{\overset{above}{\longleftarrow}} \quad B$$

$$\underset{below}{\overset{above}{\Longleftrightarrow}} \quad B \tag{2–3}$$

And:

$$\begin{aligned} & I(X_3; X_4) - I(X_3; X_4 \mid X_1) - I(X_3; X_4 \mid X_2) \\ =& [I(X_3; X_4) - I(X_3; X_4 \mid X_1)] - I(X_3; X_4 \mid \tilde{X}_2) && \text{(2–4)} \\ =& I(X_1; X_3; X_4) - I(X_3; X_4 \mid \tilde{X}_2) && \text{(2–5)} \end{aligned}$$

2.2.2 Theorems

The aperture was black with a darkness almost material. That tenebrousness was indeed a positive quality; for it obscured such parts of the inner walls as ought to have been revealed, and actually burst forth like smoke from its aeon-long imprisonment, visibly darkening the sun as it slunk away into the shrunken and gibbous sky on flapping membraneous wings. The odour rising from the newly opened depths was intolerable, and at length the quick-eared Hawkins

thought he heard a nasty, slopping sound down there. Everyone listened, and everyone was listening still when It lumbered slobberingly into sight and gropingly squeezed Its gelatinous green immensity through the black doorway into the tainted outside air of that poison city of madness.

Theorm 2.1 (fhtagn)**.** *Assume U is a Ph'nglui mglw'nafh Cthulhu R'lyeh wgah'nagl fhtagn on complex space, $a_1, \ldots, a_n$R'lyeh wgah'nagl points, f is defined on $U\backslash\{a_1, \ldots, a_n\}$ R'lyeh wgah'nagl fhtagn. If γ is a curve that Ph'nglui mglw'nafh $a_1, \ldots, a_n$, whose Ph'nglui mglw'nafh but not a_k fhtagn, then*

$$\oint_\gamma f(z)\,\mathrm{d}z = 2\pi\mathbf{i}\sum_{k=1}^{n}\mathrm{I}(\gamma, a_k)\mathrm{Res}(f, a_k) \tag{2–6}$$

If γ is a Jordan fhtagn, then $\mathrm{I}(\gamma, a_k) = 1$, therefore

$$\oint_\gamma f(z)\,\mathrm{d}z = 2\pi\mathbf{i}\sum_{k=1}^{n}\mathrm{Res}(f, a_k) \tag{2–7}$$

Cthulhu still lives, too, I suppose, again in that chasm of stone which has shielded him since the sun was young. His accursed city is sunken once more, for the Vigilant sailed over the spot after the April storm; but his ministers on earth still bellow and prance and slay around idol-capped monoliths in lonely places. He must have been trapped by the sinking whilst within his black abyss, or else the world would by now be screaming with fright and frenzy. Who knows the end? What has risen may sink, and what has sunk may rise.

Proof of 2.1.

Proof. Firstly,

Second, ...

Therefore ... □

Cthulhu still lives, too, I suppose, again in that chasm of stone which has shielded him since the sun was young. His accursed city is sunken once more, for the Vigilant sailed over the spot after the April storm; but his ministers on earth still bellow and prance and slay around

idol-capped monoliths in lonely places. He must have been trapped by the sinking whilst within his black abyss, or else the world would by now be screaming with fright and frenzy. Who knows the end? What has risen may sink, and what has sunk may rise.

2.3 Images

2.3.1 Image Format

Cthulhu still lives, too, I suppose, again in that chasm of stone which has shielded him since the sun was young. His accursed city is sunken once more, for the Vigilant sailed over the spot after the April storm; but his ministers on earth still bellow and prance and slay around idol-capped monoliths in lonely places. He must have been trapped by the sinking whilst within his black abyss, or else the world would by now be screaming with fright and frenzy. Who knows the end? What has risen may sink, and what has sunk may rise.

Figure 2–1: Ph'nglui mglw'nafh Cthulhu R'lyeh wgah'nagl fhtagn.
FigEnglish caption

Ph'nglui mglw'nafh Cthulhu R'lyeh wgah'nagl fhtagn.

2.3.2 Long Captions

Cthulhu still lives, too, I suppose, again in that chasm of stone which has shielded him since the sun was young. His accursed city is sunken once more, for the Vigilant sailed over the spot after the April storm; but his ministers on earth still bellow and prance and slay around idol-capped monoliths in lonely places. He must have been trapped by the sinking whilst within

his black abyss, or else the world would by now be screaming with fright and frenzy. Who knows the end? What has risen may sink, and what has sunk may rise.

Figure 2–2
FigPh'nglui mglw'nafh Cthulhu R'lyeh wgah'nagl fhtagn.

Figure 2–3
Fig 2Ph'nglui mglw'nafh Cthulhu R'lyeh wgah'nagl fhtagn.

2.4 Tables

His accursed city is sunken once more, for the Vigilant sailed over the spot after the April storm; but his ministers on earth still bellow and prance and slay around idol-capped monoliths in lonely places. He must have been trapped by the sinking whilst within his black abyss, or else the world would by now be screaming with fright and frenzy. Who knows the end? What has risen may sink, and what has sunk may rise.

His accursed city is sunken once more.

[1]His accursed city is sunken once more Publication quality tables in LATEX

2.5 References

Poor Johansen's handwriting almost gave out when he wrote of this. Of the six men who never reached the ship, he thinks two perished of pure fright in that accursed instant. The Thing cannot be described - there is no language for such abysms of shrieking and immemorial lunacy, such eldritch contradictions of all matter, force, and cosmic order.

1. 用户将论文中需要引用的参考文献条目，录入纯文本数据库文件 (bib 文件)。
2. 调用 xelatex 对论文模板做第一次编译，扫描文中引用的参考文献，生成参考文献入口文件 (aux) 文件。
3. 调用 bibtex，以参考文献格式和入口文件为输入，生成格式化以后的参考文献条目文件 (bib)。
4. 再次调用 xelatex 编译模板，将格式化以后的参考文献条目插入正文。

Poor Johansen's handwriting almost gave out when he wrote of this. Of the six men who

Table 2–1: [1]

TableA Table

Item		
Animal	Description	Price ($)
Gnat	per gram	13.65
	each	0.01
Gnu	stuffed	92.50
Emu	stuffed	33.33
Armadillo	frozen	8.99

Table 2–2

TableA Table with footnotes

total	20[1]		40		60	
	www	k	www	k	www	k
	4.22 (2.12)	120.0140[2]	333.15	0.0411	444.99	0.1387
	168.6123	10.86	255.37	0.0353	376.14	0.1058
	6.761	0.007	235.37	0.0267	348.66	0.1010

[1] the first note.
[2] the second note.

never reached the ship, he thinks two perished of pure fright in that accursed instant. The Thing cannot be described - there is no language for such abysms of shrieking and immemorial lunacy, such eldritch contradictions of all matter, force, and cosmic order.

Cthulhu still lives, too, I suppose, again in that chasm of stone which has shielded him since the sun was young. His accursed city is sunken once more, for the Vigilant sailed over the spot after the April storm; but his ministers on earth still bellow and prance and slay around idol-capped monoliths in lonely places. He must have been trapped by the sinking whilst within his black abyss, or else the world would by now be screaming with fright and frenzy. Who knows the end? What has risen may sink, and what has sunk may rise.

Source Code 2.1: Google Scholar

```
@phdthesis{Ph'nglui mglw'nafh Cthulhu R'lyeh wgah'nagl fhtagn.,
  title={Ph'nglui mglw'nafh Cthulhu R'lyeh wgah'nagl fhtagn.},
  author={Unknown},
  year={1931},
  school={Miskatonic University}
}
```

推荐修改后在 bib 文件中的内容为:

Source Code 2.2: Reference

```
@phdthesis{???1930,
  title={Ph'nglui mglw'nafh Cthulhu R'lyeh wgah'nagl fhtagn.},
  author={Unknown},
  date={1931},
  address={Arkham City},
  school={Miskatonic University}
}
```

Cthulhu still lives, too, I suppose, again in that chasm of stone which has shielded him since the sun was young. His accursed city is sunken once more, for the Vigilant sailed over the spot after the April storm; but his ministers on earth still bellow and prance and slay around idol-capped monoliths in lonely places. He must have been trapped by the sinking whilst within his black abyss, or else the world would by now be screaming with fright and frenzy. Who knows

the end? What has risen may sink, and what has sunk may rise.

2.6 Code

Poor Johansen's handwriting almost gave out when he wrote of this. Of the six men who never reached the ship, he thinks two perished of pure fright in that accursed instant. The Thing cannot be described - there is no language for such abysms of shrieking and immemorial lunacy, such eldritch contradictions of all matter, force, and cosmic order.

Source Code 2.3: C code

```c
#include <stdio.h>
#include <unistd.h>
#include <sys/types.h>
#include <sys/wait.h>

int main() {
  pid_t pid;

  switch ((pid = fork())) {
  case -1:
    printf("fork failed\n");
    break;
  case 0:
    /* child calls exec */
    execl("/bin/ls", "ls", "-l", (char*)0);
    printf("execl failed\n");
    break;
  default:
    /* parent uses wait to suspend execution until child finishes */
    wait((int*)0);
    printf("is completed\n");
    break;
  }

  return 0;
}
```

Summary

测试应用 [1], [2], [3].

这里是全文总结内容。

2015 年 2 月 28 日，中央在北京召开全国精神文明建设工作表彰暨学雷锋志愿服务大会，公布全国文明城市（区）、文明村镇、文明单位名单。上海交通大学荣获全国文明单位称号。

全国文明单位这一荣誉是对交大人始终高度重视文明文化工作的肯定，是对交大长期以来文明创建工作成绩的褒奖。在学校党委、文明委的领导下，交大坚持将文明创建工作纳入学校建设世界一流大学的工作中，全体师生医护员工群策群力、积极开拓，落实国家和上海市有关文明创建的各项要求，以改革创新、科学发展为主线，以质量提升为目标，聚焦文明创建工作出现的重点和难点，优化文明创建工作机制，传播学校良好形象，提升社会美誉度，显著增强学校软实力。2007 至 2012 年间，上海交大连续三届荣获“上海市文明单位”称号，成为创建全国文明单位的新起点。

上海交大自启动争创全国文明单位工作以来，凝魂聚气、改革创新，积极培育和践行社会主义核心价值观。坚持统筹兼顾、多措并举，将争创全国文明单位与学校各项中心工作紧密结合，着力构建学校文明创建新格局，不断提升师生医护员工文明素养，以“冲击世界一流大学汇聚强大精神动力”为指导思想，以“聚焦改革、多元推进、以评促建、丰富内涵、彰显特色”为工作原则，并由全体校领导群策领衔“党的建设深化、思想教育深入、办学成绩显著、大学文化丰富、校园环境优化、社会责任担当”六大板块共 28 项重点突破工作，全面展现近年来交大文明创建工作的全貌和成就。

进入新阶段，学校将继续开拓文明创建工作新格局，不断深化工作理念和工作实践，创新工作载体、丰富活动内涵、凸显创建成效，积极服务于学校各项中心工作和改革发展的大局面，在上级党委、文明委的关心下，在学校党委的直接领导下，与时俱进、开拓创新，为深化内涵建设、加快建成世界一流大学、推动国家进步和社会发展而努力奋斗！

上海交通大学医学院附属仁济医院也获得全国文明单位称号。

Chapter A　搭建模板编译环境

A.1　安装 TeX 发行版

A.1.1　Mac OS X

Mac 用户可以从 MacTeX 主页[1]下载 MacTeX 2015。也可以通过 brew 包管理器[2]安装 MacTeX 2015。

```
brew cask install mactex
```

A.1.2　Linux

建议 Linux 用户使用 TeXLive 主页[3]的脚本来安装 TeXLive 2015。以下命令将把 TeXLive 发行版安装到当前用户的家目录下。若计划安装一个供系统上所有用户使用的 TeXLive，请使用 root 账户操作。

```
wget http://mirror.ctan.org/systems/texlive/tlnet/install-tl-unx.
        tar.gz
tar xzvpf install-tl-unx.tar.gz
cd install-tl-20150411/
./install-tl
```

[1] https://tug.org/mactex/
[2] http://caskroom.io
[3] https://www.tug.org/texlive/

A.2 安装中文字体

A.2.1 Mac OS X、Deepin

Mac 和 Deepin 用户双击字体文件即可安装字体。

A.2.2 RedHat/CentOS 用户

RedHat/CentOS 用户请先将字体文件复制到字体目录下，调用 fc-cache 刷新缓存后即可在 TeXLive 中使用新字体。

```
mkdir ~/.fonts
cp *.ttf ~/.fonts                # 当前用户可用新字体
cp *.ttf /usr/share/fonts/local/    # 所有用户可以使用新字体
fc-cache -f
```

Chapter B Maxwell Equations

选择二维情况，有如下的偏振矢量:

$$\mathbf{E} = E_z(r,\theta)\hat{\mathbf{z}} \tag{B–1a}$$

$$\mathbf{H} = H_r(r,\theta))\hat{\mathbf{r}} + H_\theta(r,\theta)\hat{\boldsymbol{\theta}} \tag{B–1b}$$

对上式求旋度:

$$\nabla \times \mathbf{E} = \frac{1}{r}\frac{\partial E_z}{\partial \theta}\hat{\mathbf{r}} - \frac{\partial E_z}{\partial r}\hat{\boldsymbol{\theta}} \tag{B–2a}$$

$$\nabla \times \mathbf{H} = \left[\frac{1}{r}\frac{\partial}{\partial r}(rH_\theta) - \frac{1}{r}\frac{\partial H_r}{\partial \theta}\right]\hat{\mathbf{z}} \tag{B–2b}$$

因为在柱坐标系下，$\overline{\overline{\mu}}$ 是对角的，所以 Maxwell 方程组中电场 **E** 的旋度:

$$\nabla \times \mathbf{E} = \mathbf{i}\omega\mathbf{B} \tag{B–3a}$$

$$\frac{1}{r}\frac{\partial E_z}{\partial \theta}\hat{\mathbf{r}} - \frac{\partial E_z}{\partial r}\hat{\boldsymbol{\theta}} = \mathbf{i}\omega\mu_r H_r\hat{\mathbf{r}} + \mathbf{i}\omega\mu_\theta H_\theta\hat{\boldsymbol{\theta}} \tag{B–3b}$$

所以 **H** 的各个分量可以写为:

$$H_r = \frac{1}{\mathbf{i}\omega\mu_r}\frac{1}{r}\frac{\partial E_z}{\partial \theta} \tag{B–4a}$$

$$H_\theta = -\frac{1}{\mathbf{i}\omega\mu_\theta}\frac{\partial E_z}{\partial r} \tag{B–4b}$$

同样地，在柱坐标系下，$\bar{\bar{\epsilon}}$ 是对角的，所以 Maxwell 方程组中磁场 **H** 的旋度：

$$\nabla \times \mathbf{H} = -\mathbf{i}\omega\mathbf{D} \tag{B–5a}$$

$$\left[\frac{1}{r}\frac{\partial}{\partial r}(rH_\theta) - \frac{1}{r}\frac{\partial H_r}{\partial \theta}\right]\hat{\mathbf{z}} = -\mathbf{i}\omega\bar{\bar{\epsilon}}\mathbf{E} = -\mathbf{i}\omega\epsilon_z E_z\hat{\mathbf{z}} \tag{B–5b}$$

$$\frac{1}{r}\frac{\partial}{\partial r}(rH_\theta) - \frac{1}{r}\frac{\partial H_r}{\partial \theta} = -\mathbf{i}\omega\epsilon_z E_z \tag{B–5c}$$

由此我们可以得到关于 E_z 的波函数方程：

$$\frac{1}{\mu_\theta\epsilon_z}\frac{1}{r}\frac{\partial}{\partial r}\left(r\frac{\partial E_z}{\partial r}\right) + \frac{1}{\mu_r\epsilon_z}\frac{1}{r^2}\frac{\partial^2 E_z}{\partial \theta^2} + \omega^2 E_z = 0 \tag{B–6}$$

Bibliography

[1] J. D. Joannopoulos, S. G. Johnson, and J. N. Winn. *Photonic Crystals: Molding the Flow of Light*. Princeton University Press, 2008.

[2] H. Chen and C. T. Chan. "Acoustic cloaking in three dimensions using acoustic metamaterials". In: *Applied Physics Letters* 91 (2007), p. 183518.

[3] H. Chen et al. "Electromagnetic Wave Interactions with a Metamaterial Cloak". In: *Physical Review Letters* 99.6 (2007), p. 63903.

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