

美赛建模论文写作

李 良

写作很重要！评阅老师只看得到论文

把自己的工作以科学的方式呈现出来

写作方式绝不唯一，重在自己体会、摸索

建模论文结构：

- Title
- **Summary**
- Keywords
- (Nontechnical Report)
- Introduction (含背景、问题重述、现有研究)
- Problem Analysis 或 Preliminary Study
- Assumptions
- Notations
- **Model Construction and Solution**
- Further Discussion
- Reference

语言特点

- 时态：一般用三种基本时态
- 句式：多用陈述句，正文中涉及数学推导等可用祈使句；偶尔疑问，不用感叹句
- 语态：主动语态与被动语态结合使用，不要整篇整段都用We作主语
- 善用复合句、名词组、缩略词、复合词

data transmission systems

OLS (Ordinary least-squares)

self-design, dust-free

标题 (Title)

- **基本功能：**概括全文；吸引读者；便于检索
- **语言特点：**一般不用完整的句子；多用名词词组或动名词，如：**Database Logic, Conference Interpreting and Its Effect Evaluation, Nonlinear Waves in Elastic Rods, Introducing Management into...**
- **写作要求：**
 1. **简短** 论文标题一般在**10**个字内，最多不超过**15**个词。

2. 避免标题空洞和笼统 如: **Computer Retrieval (计算机检索)应该为” Computer Retrieval on Literature of Physics”或“Computer Retrieval on Conference Information”。**

3. 不加冗余套语 英文科技论文的标题中一般不加用 **“Regarding...”, “Studies on ...”**
“Investigation on ...”, “Observation on ...”,
“The Method of ...”, “Some thought on...”,
“A research on...”等冗余套语。

摘要 (Summary)

- **基本功能：** 概括全文的缩影；决定取舍的依据
- **体现总分总结构：**

第一段总体交代背景和要做什么，以及总体上怎么做的。后面各段按题目中的各个问题展开，体现“三要素”。最后一段简单总结（可以不写）

一般摘要写三分之二到四分之三页。

摘要 “三要素”

- **写作要领：**

1. **避免过于简单 如：**

In this paper, reconstruction of many holograms are presented by computer with an analyzed mathematical model.

The process is proved to be effective, and the authors are satisfied with the results.

The authors conclude that the process consumes 5% less fuel and turns out 12% more power.

2. **避免句子结构单调呆板 如：**

The influence of ...is discussed. Some design considerations ... are given. A practical construction ...is shown. The method with high precision ... is presented. The measured stability data ... are also given.

3. 避免使用非通用的缩略语

4. 删除冗余词语 如:

After an extended series of repeated experiments over a long period we concluded that...

5. 注意时态用法

- 摘要中不出现：
数学公式
图、表
参考文献

关键词 (Keywords)

- **基本功能：**顾名思义；便于检索
- **语言特点：**多用名词；字数有限（**4-6**）；出处明确
- **写作要求：**论文的关键字一般列在作者与单位之下，论文摘要之上。也有列在论文摘要之下的。关键词除第一个字母大写外，一般不要求大写。关键词间用逗号、分号或大间隔隔开。最末一个关键词一般不加用逗号、分号或句号。

引言(Introduction)

- **基本功能：**引入主题内容；限定研讨范围；说明论文目的；交代写作安排

引言内容的安排可以有较大的伸缩性，但基本内容应包括研究背景、存在问题、研究目的、主要结论和论文框架。

- **语言特点：**
 - 常以简述研究的背景入手；
 - 常以回顾以往的历史展开；
 - 常以解决现存的问题承转；
 - 常以开展本文的研究落笔。

• 写作要领：

➤ 简要综述有关文献,以作为背景材料;

1. 在背景介绍和问题的提出中，应引用最相关的文献，优先选择引用的文献应包括相关研究中的经典、重要和最有说服力的文献。文献回顾至少有一二个段落。
2. 引述其他学者的研究行为时通常采用一般过去时。
Chen(1992) showed (found, reported, noted, suggested, observed, pointed out) that the water boils at 100°C.
Somebody reported...,but...

The suggestion on...was given by ...however

The experiment on ... was carried by ...

The research on... was made by ...

3. 描述特定领域中最近的某种趋势，或强调表示某些最近发生的事件对现在的影响时，常用现在完成时。如：

In recent years, a variety of standards have been proposed in literatures.

The results made by ...have shown...

Recent experiments by ... have suggested...

The previous work on...has indicated...

➤ 提出研究问题

1. 指出存在问题的方法通常有以下几种形式：

- (1) 以前的学者尚未研究或处理不够完善的重要课题；
- (2) 过去的研究衍生出有待探讨的新问题；
- (3) 以前学者曾提出两个以上互不相容的理论和观点，而且必须作进一步研究，才能解决的问题；
- (4) 过去的研究很自然可以扩展到新的题目或领域，或以前提出的方法或技术可以改善或扩展到新的应用范围。

2. 提出问题的表达方式

However, little is known about X 或 little literature is available on X

However, few studies have been done on (published on) X 或 little attention has been devoted to X

Although much research has been done on..., little work has been done on 或 X has been studied extensively, but little attention has been devoted to...

叙述前人的欠缺以强调自己的创新时，可以采用如下的表达：

To the author's knowledge...;

There is little information available in literature about...;

Until recently, there is some lack of knowledge about...;

➤ **明确研究的目的——一切题**

The purpose (aim, objective) of this paper is to analyze the effect of X on Y.

This paper presents(reports, describes, discusses) the results of experiments in which X is mixed with Y.

In this paper, we propose a new model (algorithm) for sorting X.

In this paper, experimental results are presented to show that X.

In this paper, we will argue(attempt to show) that ...

This paper will propose (present, evaluate, discuss) a new method for analyzing X (a theory that attempts to explain X)

The primary focus of this paper is on...

➤交代本文写作安排

This paper is divided into five major sections as follows...

Section One of this paper opens with ...

Section Three develops the second hypothesis on...

In this paper, data and results are presented under major heading of ...

Section 1 shows (introduces, reveals, treats, develops, deals with) ...

In section 4, we will present experimental results that confirm the effectiveness of the proposed method.

The result of ...is given in the last section.

Section 5 presents concluding remarks.

问题分析 (Problem Analysis)

- 针对提出的几个小问题提出初步的解决办法设想。
- 对我们论文采用方法、模型的合理性做出解释。
- 帮助队内进行分工合作。

模型假设

- 模型假设可以写到**Introduction**部分，也可单独成节，或写到**问题分析**一节。
- 主要指出去掉了哪些次要因素，要**解释**为什么要做这样的假设，即合理性。
- 注意：假设的目的**不仅是**为了使模型简单，更是有了这些假设更能体现出事物的本质联系。
- **justification** 三线表

模型建立

- 不管是借鉴的参考文献的模型（**要引用文献**）还是自己创建的模型，都要对模型作**充分的解释**。
- 模型怎么来的？模型是什么样的？模型是什么意思？
- 注意：
 - 科学性
 - 清晰、明确
 - 阅读顺畅

模型求解

- 主要描述求解的算法、结果
- 注意：不是描述你的解题过程
- 算法描述可用流程图、伪代码等
- 结论展示多用图表，并对图表要有充分的说明。
 - 图表要有编号、标题。图甚至可以有更多的说明
 - **legend**

结果 (Result)

- 浓缩观察的事实；归纳实验的发现；分析研究的结果。能回答、解决题目提出的问题。
- 语言特点：

The results are shown in Table 1.

The test results presented in Fig.2 show ...

As Figure 2 shows, the temperature increased rapidly.

- **写作要领：**

文字表达要准确、简洁，避免使用冗长的词汇来介绍或解释图表。**应在文中指出图表所揭示的结论**。如：

Fig. 1 shows the relationship between A and B.

A was significantly higher than B at all time points checked Fig.1.

对研究中**成功的结果**或结果中成功的部分，是结果的核心，应予以评述和比较

After flight of less than two hours, 11% of the army pilot and 33% of the civilian pilots reported back pain. It appears that because of their greater accumulated flying time, civilian pilots are subject to higher incidence of back pain.

尽量去切题

The results **agree** well with the findings of Smith, et.al.

The theoretical model fits the experimental data well.

The data **indicate** that the model is reliable and accurate.

Our algorithm **requires** consistently less processing time than Chen's algorithm.

The values predicted by our model have a smaller degree of error than the values generated by Rickert's model do.

模型或算法分析、验证

Model Evaluation

- 因为有模型假设、可能有人为设置的参数(值)，要对是否合理做解释说明，从而说明我们模型、算法、结果是可信的。
- 通常可以作灵敏性分析，即某个参数值变化对结果的影响。
- 可以放在后面单独一章来描述，也可以在每个问题解决之后用一小节来作。

参考文献 (Reference)

- 要列出参考文献列表
- 格式要统一
- 要在正文中引用参考文献
- 中文参考文献怎么办？

非技术性报告(Nontechnical Report)

- 主要给出问题解决的办法，即怎么做。
- 给出结果，说明这样做会带来什么收益。
- 最好有图有真相

评阅论文是很主观的事情

排版很重要，行距、字体变化体现文章结构！

文章图文并茂，生动美观！



Thanks