

## Here is Your Title

### Summary

Global warming, El Niño... With the emergence of various extreme climates, **Australia's wildfires** occur more frequently. The greenhouse gases emitted after combustion have exacerbated global warming, which seems to have entered an endless loop. At the same time, hundreds of millions of lives have been killed in the fire, which makes us sad. To better control wildfires, we modeled the **distribution of drones** assisting in the observation to achieve the best balance between economy and efficiency.

Several models are established: Model I: Rasterized Multi-Objective Optimization Model; Model II: Model Verification Simulated by Poisson Process; Model III: Hovering Model Based on Tabu Search, etc.

For Model I: Firstly, We find data. . . Then, we establish **model**. . . Next, we use Algorithm. . . Finally, it can be seen that. . .

For Model II: Firstly, We find data. . . Then, we establish model. . . Next, we use Algorithm. . . Finally, it can be seen that. . .

For Model III: Firstly, We find data. . . Then, we establish model. . . Next, we use Algorithm. . . Finally, it can be seen that. . .

Finally, sensitivity analysis . . . Meanwhile, robustness

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# 1 Introduction

## 1.1 Problem Background

一些常用的写作缩略语:

i.e.,... 也即是... (一定加逗号)

e.g.,... 例如,...

, etc. ..., 等等。

n.b. 特别注意

cf. 参见

美赛一定要多上图, 清晰直观, 并且格式上最好是矢量图, 例如 pdf, 而不是位图, 例如 jpg, png 等, 在形式上最好是组图, 下面列出了利用 subfigure 实现的 1x2, 1x3, 2x2 的几种组图:

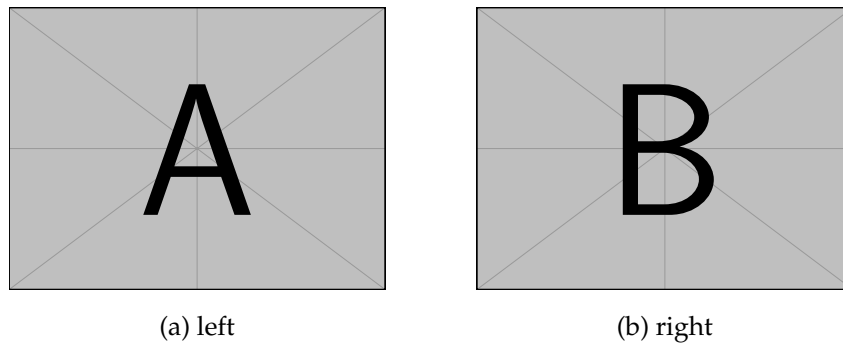


Figure 1: Two images

Figure 1 gives an example of subfigures. Figure 1a is on the left, and Figure 1b is on the right.

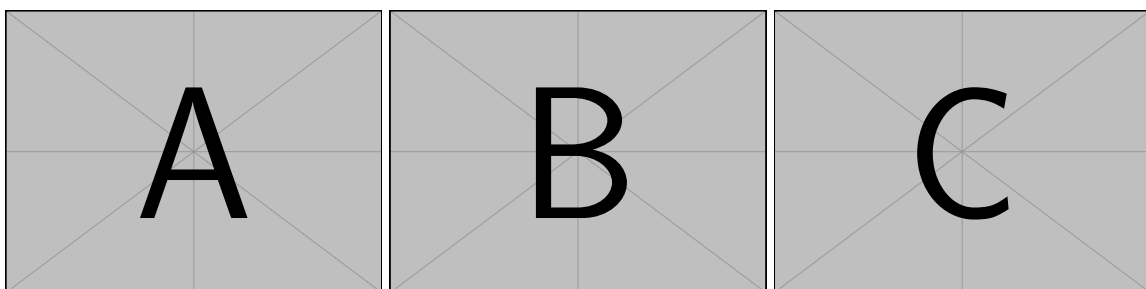


Figure 2: Three images

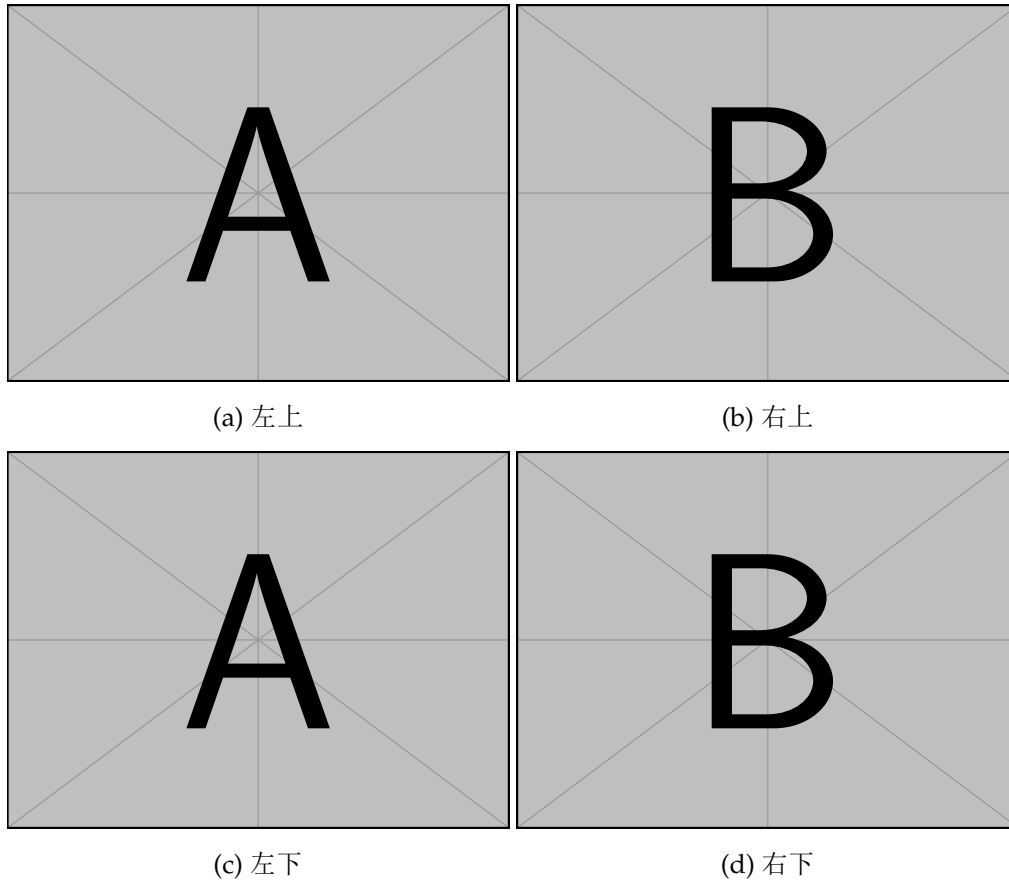


Figure 3: 组图组图变变变

## 1.2 Literature Review

Two major problems are discussed in this paper, which are:

- Doing the first thing.
- Doing the second thing.

A literatrue<sup>[1]</sup> says something about this problem ...

## 1.3 Our work

We do such things ... 这部分直接上图

1. We do ...
2. We do ...
3. We do ...

## 2 Preparation of the Models

### 2.1 Assumptions and Explanations

To simplify the problem, we made the following assumptions, each of which has a corresponding reasonable explanation.

- *Assumption 1:* 假设  
     $\hookrightarrow$  *Explanation:* 理由
- *Assumption 2:* 假设  
     $\hookrightarrow$  *Explanation:* 理由
- *Assumption 3:* 假设  
     $\hookrightarrow$  *Explanation:* 理由
- *Assumption 4:* 假设  
     $\hookrightarrow$  *Explanation:* 理由

Additional assumptions are made to simplify analysis for individual sections. These assumptions will be discussed at the appropriate locations.

## 2.2 Notations

Table 1 lists some important mathematical notations used in this paper.

Table 1: Notations used in this paper

Symbol	Description
$x_i$	Longitude within the i-th Wildfire Grid
$y_i$	Latitude within the i-th Wildfire Grid
$\Omega_i$	The area of the i-th grid
$d_{ki}$	the distance $d_{ki}$
$SC_k$	Score for evaluating the k-th wildfire grid
$x_{ki}^{(\alpha)}$	the $SSA_\alpha$ drone sent by the k-th EOC to the i-th wild-fire grid
$x_{ki}^{(\beta)}$	the $RR_\beta$ drone sent by the k-th EOC to the i-th wildfire grid
$t_{fly}^\delta$	The flight time of drones

\*Some variables are not listed here and will be discussed in detail in each section.

## 2.3 Data

### 2.3.1 Data Collection

Websites, where we collect data, are listed in Table 2.

Table 2: Notations used in this paper

Database Names	Database Websites
Google Scholar	<a href="https://scholar.google.com">https://scholar.google.com</a>
Wikipedia	<a href="https://www.wikipedia.org">https://www.wikipedia.org</a>
wolframalpha	<a href="https://www.wolframalpha.com">https://www.wolframalpha.com</a>

### 2.3.2 Data Processing

## 3 Model 1

### 3.1 Details about Model 1

The detail can be described by equation (1):

$$\frac{\partial u}{\partial t} - a^2 \left( \frac{\partial^2 u}{\partial x^2} + \frac{\partial^2 u}{\partial y^2} + \frac{\partial^2 u}{\partial z^2} \right) = f(x, y, z, t) \quad (1)$$

## 4 Model 2

### 4.1 Conclusion of Model 2

The results are shown in Figure 4, where  $t$  denotes the time in seconds, and  $c$  refers to the concentration of water in the boiler.

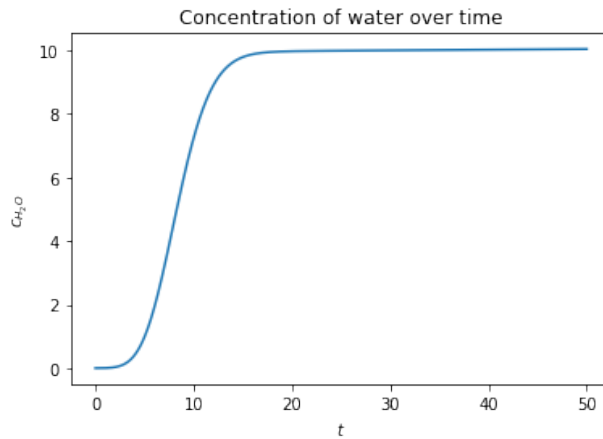


Figure 4: The result of Model 2

再来一个伪代码，默认样式为隐藏行号的三线表形式的伪代码

可在`ldmcm.sty`中修改样式，更详细的用法请参考 `algorithm2e` 宏包文档

---

**Algorithm 1:** How to write algorithms

---

**Input:** 输入**Output:** 输出

initialization;

**while** *not at end of this document* **do**

read current;

**repeat**

do these things;

**until** *this end condition*;    **if** *understand* **then**

go to next section;

current section becomes this one;

**else**

go back to the beginning of current section;

**do**

do these things;

**while** *this end condition*;



## 4.2 Commetary on Model 2

The instance of long and wide tables are shown in Table 3.

Table 3: Basic Information about Three Main Continents (scratched from Wikipedia)

Continent	Description	Information
Africa	Africa Continent is surrounded by the Mediterranean Sea to the north, the Isthmus of Suez and the Red Sea to the northeast, the Indian Ocean to the southeast and the Atlantic Ocean to the west.	At about 30.3 million km <sup>2</sup> including adjacent islands, it covers 6% of Earth's total surface area and 20% of its land area. With 1.3 billion people as of 2018, it accounts for about 16% of the world's human population.
Asia	Asia is Earth's largest and most populous continent which located primarily in the Eastern and Northern Hemispheres. It shares the continental landmass of Eurasia with the continent of Europe and the continental landmass of Afro-Eurasia with both Europe and Africa.	Asia covers an area of 44,579,000 square kilometres, about 30% of Earth's total land area and 8.7% of the Earth's total surface area. Its 4.5 billion people (as of June 2019) constitute roughly 60% of the world's population.
Europe	Europe is a continent located entirely in the Northern Hemisphere and mostly in the Eastern Hemisphere. It comprises the westernmost part of Eurasia and is bordered by the Arctic Ocean to the north, the Atlantic Ocean to the west, the Mediterranean Sea to the south, and Asia to the east.	Europe covers about 10,180,000 km <sup>2</sup> , or 2% of the Earth's surface (6.8% of land area), making it the second-smallest continent. Europe had a total population of about 741 million (about 11% of the world population) as of 2018.

## **5 Model 3**

## **6 Test the Model**

### **6.1 Sensitivity Analysis**

### **6.2 Robustness Analysis**

这部分很重要，不能缺！

## **7 Conclusion**

### **7.1 Summary of Results**

### **7.2 Strengths**

- The sensitivity analysis of the model demonstrates the effectiveness of the model under different parameter combinations and prove the robustness of the mod
- Second one ...

### **7.3 Weaknesses and Improvements**

- The analysis of fish migration can be more accurate if we have more complete data;
- Some approximate analysis methods are applied to model the management of fishing companies, which may lead to a situation contrary to the actual one in extreme cases.

## Memorandum

**To:** Heishan Yan

**From:** Team 1234567

**Date:** October 1st, 2019

**Subject:** A better choice than MS Word:  $\text{\LaTeX}$

In the memo, we want to introduce you to an alternate typesetting program to the prevailing MS Word:  $\text{\LaTeX}$ . In fact, the history of  $\text{\LaTeX}$  is even longer than that of MS Word. In the 1970s, the famous computer scientist Donald Knuth first came out with a typesetting program, named  $\text{\TeX}$ ...

Firstly, ...

Secondly, ...

Lastly, ...

According to all those mentioned above, it is really worth to have a try on  $\text{\LaTeX}$ !

## References

[1] Helmut Kopka and Patrick W Daly. *Guide to LATEX*. Pearson Education, 2003.

## Appendix A: Further on L<sup>A</sup>T<sub>E</sub>X

To clarify the importance of using L<sup>A</sup>T<sub>E</sub>X in MCM or ICM, several points need to be covered, which are ...

To be more specific, ...

All in all, ...

Anyway, nobody **really** needs such appendix ...

## Appendix B: Program Codes

Here are the program codes we used in our research.

**code/example.py**

```
# Python code example
for i in range(10):
    print('Hello, \world!')
```

**code/example.m**

```
% MATLAB code example
for i = 1:10
    disp("hello, world!");
end
```