



上海交通大学

SHANGHAI JIAO TONG UNIVERSITY



研究生院英语教改试点

研究生学位课

航空航天学术英语

Academic English for Aerospace Graduates

Lecture VII

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Last Week Homework

- 1 Find 2-3 research papers from your own field, analyze the structure & sentences of introduction part.
- 2 Explain **Introduction** of your research paper in 5 mins on next class
 - Assign 4 students from different disciplines to present and 6 students to question
 - A video camera will record everyone's presentation and replay it on class with a Q & A process.



Lecture Contents

4. Introduction

- Purpose of Introduction
- Structure of Introduction
- Basic Sentence Patterns

5. Introduction Appreciation & Literature Review

- Introduction Appreciation (Good & Bad)
- Intensive Reading & Extensive Reading

6. Citation & Plagiarism

- Right Citation
- Avoiding Plagiarism



Review on Structure of Introduction

- **Move 1: Establishing a research territory**
 - showing the general research area is important
 - reviewing previous research in this area
- **Move 2: Identifying a gap**
 - indicating the gap or problem in previous research
- **Move 3: Filling the gap**
 - stating the nature & contribution of the present research
 - indicating the structure of the research paper



Evaluative Appreciation

Read the introductions and think:

- **What is the research territory?**
- **How is the research history?**
- **What is the niche (gap)?**
- **How to occupy the niche (gap) ?**
- **What is the contribution?**

Niche was borrowed from French in the 17th century.

- a. A situation or activity specially suited to a person's interests, abilities, or nature:
- b. A special area of demand for a product or service.

[\(From the Free Dictionary\)](#)



Example 1



example1.pdf

1. What is the territory?

1) Opening words (**from general to specific – four paragraphs**)

- FLIGHT control of unmanned aerial vehicles (UAVs) is an active and challenging topic of research (**general**)
- Vertical takeoff and landing rotorcraft with hover flight capabilities, form a large and important class of UAVs. (**specific**)
- We highlight the quadrotor as an ideal platform for robotic systems, particularly suited for the development and test of new control strategies. (**more specific**)
- During the landing maneuver, there are two undesirable behaviors arising from the modified dynamics due to contact with the ground, which must be avoided. (**more special problems**)



Example 1 (cont.)

1. What is the territory?

2) Literature review (from early to recent)

- Early research work with experimental results for landing maneuvers considered horizontal flat and stable landing surfaces.... **(early research)**
- Recently, particular emphasis has been laid on other flight conditions where interaction with the environment ... **(recent results)**
- The essence of the different dynamic behaviors of an aerial vehicle when interacting with the environment - hybrid automation **(recent key technology)**
- In [23], guarantees on the safety and performance of hybrid automata modeling robotic aerial vehicles are achieved through reachability analysis using a dynamic game formulation with Hamilton–Jacobi method. **(recent key progress)**



Example 1 (cont.)

2. What is the niche (gap) ?

(page 401 right part paragraph 2)

- Experimental results are presented for a quadrotor performing a backflip maneuver divided into sections, each corresponding to a different operating mode. Starting from the desired final location, backward reachable sets (sets from which the desired state can be provably attained) are derived for the vehicle through optimization techniques, leading to a final feasible maneuver. **(most recent achievements)**
- **However, the vehicle dynamics do not change during the maneuver**, unlike the proposed landing maneuver where a collision with the ground leads to a jump in the system state and changes the vehicle dynamics. **(the gap)**



Example 1 (cont.)

3. How to occupy the niche (**fill the gap**)?

(page 401 right part paragraph)

- In this paper, we build on the works presented in [24] and [25] and **propose a hybrid flight controller**..., for a quadrotor vehicle in challenging circumstances. In the spirit of [24], a hybrid automaton is used to model the vehicle, thereby **encapsulating the complete dynamics of the different flight regimes** that the vehicle must traverse.



Example 1 (cont.)

4. What is the contribution?

(page 402 left part paragraph 1-2)

- **The main contribution of this paper consists of** the explicit design of the hybrid automaton model, robust reference maneuvers, and low-level controllers for the robust landing of a quadrotor vehicle and consequent experimental evaluation of the proposed architecture.



Example 1 (cont.)

Final part – (structure of the paper)

(page 402 left part paragraph 3)

- The remainder of this paper is organized as follows. Section II presents the hybrid automaton model for the vehicle. The robust control architecture is discussed in Section III, which entails the generation of the robust reference maneuvers, low-level controllers, and the supervisor. The experimental setup used to test the control algorithms is detailed in Section IV, and Section V presents the experimental results. Finally, the concluding remarks and future work considerations are presented in Section VI.



Example 2

Research on the B747 Longitudinal Control Based on the Structure Pilot Model

1 INTRODUCTION

Various government departments, aircraft manufacturers and airlines operating companies have been paying close attention to aviation safety and investing a lot of manpower and resources to enhance the safety of aircraft. In recent years, based on the analysis of flight accident statistics, about 70% of the accidents are caused by human factors, and only about 20% of the accidents are caused by the failure of traditional aircraft machinery and electronic equipment. Human factors have become the main inducing factors of aviation accidents and reducing the accident rate caused by human factors in flight crew has become a hot topic in the field of aviation safety. Therefore, in the study of flying qualities, the pilot factors should fully consider, and establish effective pilot models.



Example 2 (cont.)

Based on the research of the human-machine control dynamics, the research on the characteristics of the pilot has a long history. At present, the pilot models used for the study of the human - machine closed loop flight quality analysis mainly include McRuer model, structure pilot model and optimal control model(OCM).[1] From the end of seventy's to the early eighty's, the structure pilot model was put forward from the point of view of human body and physiology by Hess. The pilot's behavior is described from the subsystem of the human body, including feeling institution, central nervous system and neuromuscular system.[2] In several existing pilot model, the study on the parameters of the structure pilot model is maturer and it can reflect the driver's mechanism characteristics completely. In this paper, the structure pilot model is used in the human-in-the-loop simulation.



Example 2 (cont.)

Importing pilot's control in simulation process realizes human-machine interactive simulation and the optimization of control parameters in man-machine system will achieve a better control effect.

5 REFERENCES

- [1].Duane T. McRuer, Mathematical Models of Human Pilot behavior, Advisory Group for Aerospace Research and Development.
- [2].Qu xiangju, Research on Modeling of pilot model, 2003, Beijing University of Aeronautics and Astronautics:p.4--5.



Example 2 (cont.)

- Any suggestions to improve the Introduction of this paper?

Think about:

- 1) **What is the research territory?**
- 2) **What are previous research works?**
- 3) **What is the gap?**
- 4) **How to fill the gap?**
- 5) **What is the contribution?**



Example 2 (cont.)

- **Comments:**

- 1) **Good at pointing out research territory, However, no reference is given.** (“Human factors have become the main inducing factors of aviation accidents and reducing the accident rate caused by human factors in flight crew has become a hot topic in the field of aviation safety. Therefore, in the study of flying qualities, the pilot factors should fully consider, and establish effective pilot models.”, Last two sentences in Paragraph 1)



Example 2 (cont.)

2) Bad at literature review, only two references are cited. (“At present, the pilot models used for the study of the human - machine closed loop flight quality analysis mainly include McRuer model, structure pilot model and optimal control model(OCM).[1] From the end of seventy's to the early eighty's, the structure pilot model was put forward from the point of view of human body and physiology by Hess. The pilot's behavior is described from the subsystem of the human body, including feeling institution, central nervous system and neuromuscular system.[2]”, in Paragraph 2)



Example 2 (cont.)

3) The author cannot point out the gap. (“In several existing pilot model, the study on the parameters of the structure pilot model is maturer and it can reflect the driver's mechanism characteristics completely”, in Paragraph 2)

4) The paper is not strong on filling the gap. (“In this paper, the structure pilot model is used in the human-in-the-loop simulation.”, in Paragraph 2)



Example 2 (cont.)

3) The author cannot point out the gap. (“In several existing pilot model, the study on the parameters of the structure pilot model is maturer and it can reflect the driver's mechanism characteristics completely”, in Paragraph 2)

4) The paper is not strong on filling the gap. (“In this paper, the structure pilot model is used in the human-in-the-loop simulation.”, in Paragraph 2)



Example 2 (cont.)

5) The author presented the contribution, however, it could be more accurate and concrete. (“Importing pilot’s control in simulation process realizes human-machine interactive simulation and the optimization of control parameters in man-machine system will achieve a better control effect.”, in Paragraph 3)



Intensive Reading & Extensive Reading

1. Intensive Reading

1) The target is to answer several important questions

- Which field?
- What is the problem (**related to you**)?
- What is the objective of this research?
- What is the method (**understand or not**)?
- What is the result (**good or bad**) ?
- Is the method in this paper is helpful to generate new ideas?



Intensive Reading & Extensive Reading

1. Intensive Reading (cont.)

- 2) Do not read too fast. - be **relax** and leave time to think
- 3) Write down long sentences and analyze.
- 4) Do not feel uneasy if some details are not clear. (**later will be clear or this point is not important**)
- 5) Read the paper with the help of dictionary.
- 6) Read text and figure separately.
- 7) Read several times, each time **focus on one target**.



Intensive Reading & Extensive Reading

2. Extensive Reading

- 1) Read abstract and determine if the paper needs to be read further? **(interested field, important?)**
- 2) If yes, then read the paper to know the problem, the history, the result, the method through introduction, conclusion, simulations (experiments) parts.
- 3) Read briefly on the method part, if it is understandable and useful?
- 4) Classify and record. **(interested topic, useful method?)**



Homework

- ① Read **10-20** research papers extensively in your own field & find **1-2 most related** articles.
- ② Read the selected articles **intensively** and write down the technical **gap** and the **way** to fill the gap.
- ③ Explain the **REVISED Introduction** of your manuscript in 5 min on next class
 - Assign 4 students from different disciplines to present and 6 students to question
 - A video camera will record everyone's presentation and replay it on class with a Q & A process.