论文写作指导
(How to Write a Qualified Scientific Paper)
第二讲：论文标题、摘要的写作规范

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Section 1

提纲

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Section 2

前课回顾

课程目标

- 课程目标（Goal）：学习学术期刊论文撰写的规范和方法
  - 掌握学术论文写作的基本常识和规范.
  - 学习学术论文的基本范式和写作技巧.
  - 学习相关写作辅助工具的使用方法.
  - 了解学术论文投稿流程及相关注意事项.
- 参考教材和资料
  - (美) 凯特·L·杜拉宾著，雷蕾译，《芝加哥大学论文写作指南（第八版)》. 北京：新华出版社，2015，ISBN:978-7-5166-1599-7.
  - (美) 张俊东、杨亲正著，《SCI 论文写作和发表：You Can Do It（第二版)》. 北京：化学工业出版社，2016，ISBN:978-7-122-26238-3.
- 线上同步
  - 腾讯会议号：566-9282-5223.
  - 地址：https://meeting.tencent.com/dm/Hjkr5Nig2309.
- 任课教师联系方式：wenbo_wang@kust.edu.cn

关于课程安排和考试形式的更正

- 第一周：科技论文总体结构串讲.
- 第二周：论文标题、摘要的写作规范.
- 第三周：引言的写作.
- 第四周：从问题建模到理论结果阐述.
- 第五周：仿真或实验.
- 第六周：结论、参考文献与投稿须知.
- 第七周或第八周：开卷考试.
  - 允许带除电子设备或有网络功能设备外的一切资料.

上一讲要点

- 严守学术道德与规范.
- 力求论文的真实性、创新性和可复现性.
- 学术论文的宏观框架结构.
- 一般的文献阅读方法.
- 学术论文的内容安排逻辑.
- 论文的主题创新模式.

特别补充强调：除学术道德外的学术立场问题

“把论文写在祖国大地上”——习近平

- 立足于“实事求是”的思想方法：事实、数据、自然科学理论等是客观实在，因此要务必做到事实求是.
- 对事实、数据、理论的解读和应用是由具体的人来完成的，研究者个体必然有其自身的立场.
- 立足于祖国大地：务必以党、国家和人民的立场为论文作者自己的根本立场.

学术立场警示案例

- 2023 年 2 月，某海外出版集团下属一国际期刊的编辑们收到了一篇来自国内一所著名高校某博士研究生的投稿：
  - 稿件主题：互联网主权视角下的全球互联网路由拓扑结构研究.
  - 稿件问题 1：该学生照搬了美国政府资助的某冷战外围宣传组织的报告立场，在论文中将中国等非西方阵营国家界定为所谓的“No-freedom”国家.
  - 稿件问题 2：该学生继续引用上述报告立场，在数据分析中将港澳台地区作为所谓的“国家”与中国并列.
- 处理结果：被中国籍编辑查出、通报单位并退稿.

Section 3

第二讲：论文标题、摘要的写作规范

撰写标题和摘要的时间节点

标题：越早越好

- 早期对标题的构思帮助作者梳理研究对象和目标方法.
- 在完成 Main Result 章节后再确认标题的适用性和细节.

摘要：放在最后

- 和结论一起撰写.
- 给予正文主体工作简明但精确的介绍.

Subsection 1

如何给论文取个好名字

如何给论文取个好名字

充分表达论文的核心内容 + 简洁（词数越少越好）

- 标题来源于对关键术语的归纳与总结.
- 标题应该明确提供如下信息（至少之一）：研究对象、方法、手段 + 特色：3+X.

1. 明示论文的主要贡献（Main Contribution）.
2. 指向性强，具体.
3. 简洁.
4. 突出特色在保值内容完整之先.
5. 吸引读者（例）：“Attention is All You Need”.

如何给论文取个好名字（续）

避免冗长、模糊的表达方式

- 短语也要注意语法!
- 反例："An Efficient Self-Organized Detection System for Algae"

- 要避免的情况
  1. 使用不必要或非公认的术语.
     - 举例："Reinforcement learning" 写成 Trial-and-error learning.
  2. 不常用的缩写
     - 举例："Energy Detection for Spectrum Sensing" 写成 ED 和 SS.
  3. 模棱两可的词汇.
  4. 无关紧要的细节.
  5. 只涉及部分研究内容
     - 举例："Optimal Spectrum Access in Dense Device-to-Device Ad-Hoc Networks" 缺少方法.

如何给论文取个好名字（续）

- 自底向上的方法：思维导图 (标题：未知环境下的蚁群-聚类自适应动态路径规划)

- 贯穿整个论文的关键术语
  - 蚁群-聚类算法.
  - 动态路径规划.
  - 自适应半径：对应环境约束“未知环境”.

自底向上的标题命名方法

贯穿整个论文的关键术语

蚁群-聚类算法 + 动态路径规划 + 自适应半径.

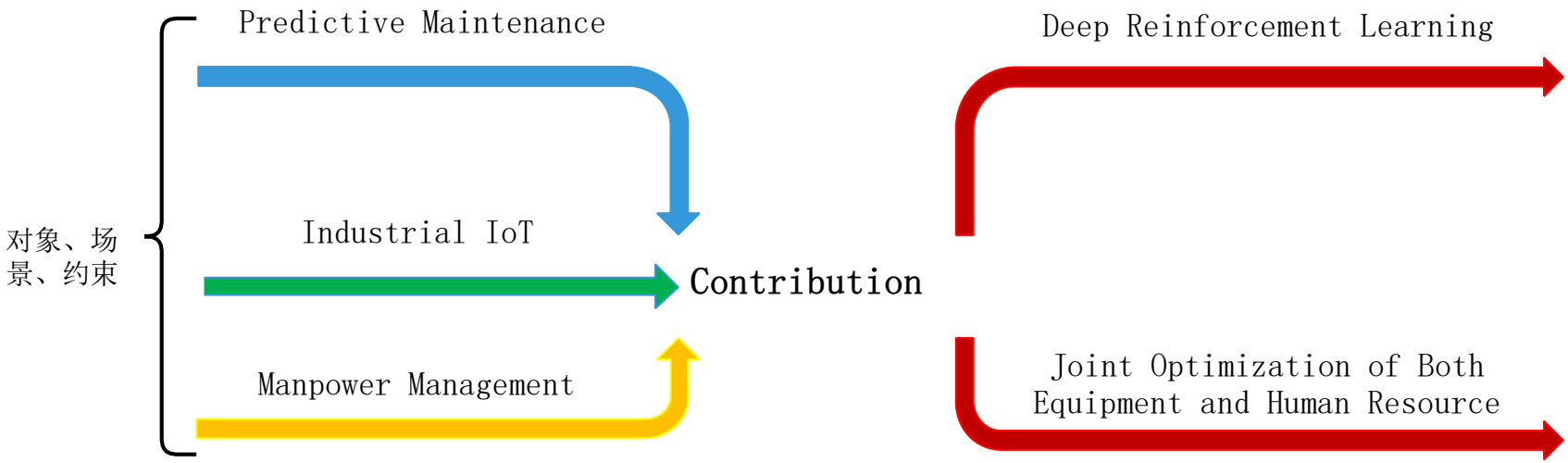
- 如何归纳和明确上述关键字？——确定贯穿每个章节的特定术语
  - 第一章：蚁群算法，动态路径规划.
  - 第二章：栅格法，动态环境构建.
  - 第三章：对角障碍、聚类算法、平滑机制.
  - 蚁群-聚类算法 (含伪代码描述的算法流程描述).
  - 第五章：动态性能，对角障碍准确性，优化参数.
  - 第六章：总结，聚类与占空比权值自动分配.
- 确认研究对象
  - 路径规划.
- 确认方法
  - 改进的蚁群算法和聚类算法.
- 确认贡献特性
  - 避障 + 动态调整蚁群算法搜索半径.

自底向上的标题命名方法：另一个例子

- 题目：Deep-Reinforcement-Learning-Based Predictive Maintenance Model for Effective Resource Management in Industrial IoT.
- 摘要：(背景)Unplanned breakdown of critical equipment interrupts production throughput in Industrial IoT (IIoT), and data-driven predictive maintenance (PdM) becomes... Manufacturers, however, are constantly faced with the onerous challenge of manually allocating suitably competent manpower resources in the event of an unexpected machine breakdown. Furthermore, human error has a negative rippling impact on both overall equipment downtime and production schedules. (对象和方法) In this article, we formulate the complex resource management problem as a resource optimization problem to determine if a model-free deep reinforcement learning (DRL)-based PdM framework can be used to automatically learn an optimal decision policy from a stochastic environment. (方法特点) Unlike the existing PdM frameworks, our approach considers PdM sensor information and the resources of both physical equipment and human as part of the optimization problem. The proposed DRL-based framework and proximal policy optimization long short term memory (PPO-LSTM) model are evaluated alongside baselines results from human participants using a maintenance repair simulator. (结果) Empirical results...

自底向上的标题命名方法：另一个例子（续）

- 题目：Deep-Reinforcement-Learning-Based Predictive Maintenance Model for Effective Resource Management in Industrial IoT.
- 思维导图



标题命名方法

命名模板

- method + OF/FOR + objective + WITH + issue/performance.
- objective + :(冒号) + An approach + BASED ON/USING + method.
- objective + BASED ON + method + OF/FOR + issue.

- 例子
  1. (方法) Non-convex Generalized Nash Games for (对象) Energy Efficient Power Allocation and Beamforming in (场景) mmWave Network.
  2. (方法) Decentralized Learning for (对象) Channel Allocation in IoT Networks over Unlicensed Bandwidth as (方法特性) a Contextual Multi-player Multi-armed Bandit Game.
  3. On (对象) Cyber Risk Management of Blockchain Networks: (方法) A Game Theoretic Approach.
  4. (方法) Vibration separation technique based localized tooth fault detection of (对象) planetary gear sets: A tutorial.
  5. (方法) Neural-learning-based (对象) telerobot control with (目标) guaranteed performance.

Subsection 2

摘要的基本结构

摘要的重要性

摘要的重要性：索引

Indicative abstract outlines the topics covered in a piece of writing so the reader can decide whether or not to read on.

- 窗口作用：内容上是一篇论文的浓缩、有展示的作用.
- 导读作用：引导读者做出是否继续读下去.
- 检索作用：方便归类与整理.

好摘要的评价指标

- 准确、诚实.
- 完整、独立.
- 简洁、具体.
- 无专业术语缩写.
- 无参考文献.

顶级期刊摘要举例

- 题目：Semi-global stabilization of linear systems with distributed infinite input delays and actuator saturations （Automatica）.
- “开门见山型”摘要：This paper addresses the semi-global stabilization problem of linear systems with simultaneous presence of distributed infinite input delays and actuator saturations. Two low gain controllers are proposed, respectively, for two classes of linear systems with both infinite input delays and actuator saturations. It is shown that under our first controller, the semi-global stabilization problem can be solved for the first class of systems where all eigenvalues of the open loop system have no positive real parts. It is also shown that under our second controller, which is much simpler, the semi-global stabilization problem can be solved for the second class of systems where all eigenvalues of the open loop system are zero. Another contribution of this paper is that the bounds for the peak magnitude of the control signals can be explicitly given. Furthermore, our results include relevant results on bounded distributed delays and constant delays as their special cases. Simulation examples are finally provided to illustrate the effectiveness of the proposed controllers.

摘要的基本结构

例子

Key word: Active Suspension, Time-varying Parameter.

- Unacceptable
  - (对象) In order to solve the clam problem of closed loop control and parameter estimation, （不精确的方法描述）this paper proposes an adaptive law for vehicle active suspension system with unknown time-varying nonlinear dynamics. （一点关于方法细节、贡献的描述）We use a time-varying learning gain in the adaptive law. It can eliminate the influence of regression vector which is caused by the clam problem. （结果模棱两可）The result of control and eliminate are embodied in the final simulation.

1. 使用不必要或非公认的术语.
2. 不常用的缩写.
3. 模棱两可的词汇.
4. 无关紧要的细节.
5. 只涉及部分研究内容.

摘要的基本结构（续）

例子

Key word: Active Suspension, Time-varying Parameter.

- Acceptable
  - This paper proposes an adaptive estimation and control method for vehicle active suspension systems with unknown time-varying parameter. Unlike the conventional methods that rely on polynomial-based parameter estimation framework, a novel parameter estimation algorithm is developed to achieve the accurate estimation of unknown time-varying parameter (e.g., vehicle mass). For this purpose, low-pass filter operation is imposed on system dynamics, by which the auxiliary variables can be constructed to extract the parameter estimation error information and then superimposed on the gradient method. Then, the estimated parameter is incorporated into an adaptive controller to regulate the vehicle motion. Theoretical analysis is conducted via the Lyapunov theorem to prove the convergence of both control error and parameter estimation error. Finally, Simulation is carried out to demonstrate the effectiveness of the proposed method.

摘要的基本结构：例 2

比较容易掌握的三段式结构

总（背景、问题）——分（方法要点）——尾（有效性证据）.

- 来源：IEEE Transactions on Systems, Man, and Cybernetics: Systems.
- (总)This paper is concerned with the $\mathcal{H}_\infty$ proportional-integral-derivative (PID) control problem for a class of linear discrete-time systems with fading measurements. (分 1：对象特性) The fading measurements are governed by the Rice fading model whose coefficients are hypothesized to be a series of independent and identically distributed Gaussian variables. (分 2：方法) By utilizing the received measurements subject to fading phenomena, a novel output-feedback PID controller is proposed where the integral-loop (accumulation sum-loop for the discrete-time case) is equipped with the limited time-window in order to reduce the computational burden. (分 3：方法指标) The main objective of the addressed problem is to design a desired PID controller such that both the exponentially mean-square stability and the prescribed $\mathcal{H}_\infty$ performance are guaranteed for the closed-loop system in the presence of fading measurements. (分 3：理论分析) With the help of Lyapunov stability theory, a sufficient condition is obtained to guarantee the desired performance and, on the basis of such a condition, the synthesis issue of the PID controller is subsequently discussed, where the orthogonal decomposition combined with a free matrix is introduced to facilitate the controller design. (结尾：有效性证据) Finally, a numerical example is exploited to

摘要的基本结构：例 3

比较容易掌握的三段式结构

总（背景、问题）——分（方法要点）——尾（有效性证据）.

- 来源：IEEE Transactions on Wireless Communications.
- (总)In this paper, we study the transmission strategy adaptation problem in an RF-powered cognitive radio network, in which hybrid secondary users are able to switch between the harvest-then-transmit mode and the ambient backscatter mode for their communication with the secondary gateway.（分 1：子方法）In the network, a monetary incentive is introduced for managing the interference caused by the secondary transmission with imperfect channel sensing.（分 2：子方法）The sensing-pricing-transmitting process of the secondary gateway and the transmitters is modeled as a single leader-multi-follower Stackelberg game.（分 3：子方法）Furthermore, the follower sub-game among the secondary transmitters is modeled as a generalized Nash equilibrium problem with shared constraints.（分 4：理论分析）Based on our theoretical discoveries regarding the properties of equilibria in the follower sub-game and the Stackelberg game, we propose a distributed, iterative strategy searching scheme that guarantees the convergence to the Stackelberg equilibrium.（结尾：有效性证据）The numerical simulations show that the proposed hybrid transmission scheme always outperforms the schemes with fixed transmission modes. Furthermore, the simulations reveal that the adopted hybrid scheme is able to achieve a higher throughput than the sum of the

摘要的撰写和修改

比较容易掌握的三段式结构

总（问题）——分（方法要点）——尾（有效性证据）.

- 来源：IEEE Transactions on Signal Processing.
- 早期版本：（总：对象）In this paper, we focus on the problem of joint beamforming control and power allocation in the ad-hoc mmWave network. （分 1：目标）Over the shared spectrum, a number of multi-input-multi-output links attempt to minimize their supply power by finding the optimal power allocation and beamformers in a self-interested manner. （分 2：方法特性）Our design is featured by considering a category of non-convex quality-of-service constraints, which are the function of the coupled strategies adopted by the mutually interfering ad-hoc links. （分 3：方法细节）We propose a two-stage, decentralized searching scheme, where the adaptation of power-levels and beamformer filters are performed in two separated sub-stages iteratively at each link. （分 4：理论分析）By introducing the analysis of the generalized Nash equilibrium, we provide the theoretic proof of the convergence of our proposed power adaptation algorithm based on the local best response together with an iterative minimum mean square error receiver. （结尾：证据）Our simulation results show that with a minimum-level requirement on the channel state information acquisition, a myopic transmit filter design based on the optimization of the local signal-to-interference-plus-noise ratio is able to achieve desirable balance between the

摘要的撰写和修改（续）

修改方向

总：补充问题背景——分：强调研究对象和方法的特性（non-convex, decentralized optimization...）

- 发表版本:（添加了背景）Network management is a fundamental ingredient for efficient operation of wireless networks. With increasing bandwidth, number of antennas and number of users, the amount of information required for network management increases significantly. Therefore, distributed network management is a key to efficient operation of future networks.（对象）This paper focuses on the problem of distributed joint beamforming control and power allocation in ad-hoc mmWave networks.（分 1：目标句被保留）Over the shared spectrum, ...（分 2：方法特性）Our design considers a family of non-convex quality-of-service constraint and utility functions characterized by monotonicity in the strategies of the various users.（分 3：方法细节描述被精简）We propose a two-stage, decentralized optimization scheme, where the adaptation of power levels and beamformer coefficients are iteratively performed by each link.（分 4：理论分析被细化）We first prove that given a set of receive beamformers, the power allocation stage converges to an optimal generalized Nash equilibrium of the generalized power allocation game. Then we prove that iterative minimum-mean-square-error adaptation of the receive beamformer results in an overall converging scheme. Several transmit beamforming schemes requiring different levels of information exchange are also compared in the proposed allocation framework.（结尾：证

Subsection 3

摘要的用词、用句规范

摘要的用词规范

- Some phrases you have to know
  - Propose=present=develop=introduce=suggest=employ=...
  - Study=analysis=investigation...
  - Use=utilize=employ=apply...
  - Obtain=achieve=yield=retain...
  - Method=approach=methodology=idea...
  - By=via=through=in terms of=...
  - Resolve=address=handle=tackle=....
  - Problem=issue=...
  - Validate=demonstrate≈illustrate

摘要的用句规范

- Some sentences you have to know
  - Subject + Link Verb + Predicative Structure (主系表)：White cast iron is quite/very hard.
  - Subject + Verb + Object（主谓宾）：S has/have excellent/outstanding/good/great XX.
  - The Attributive Clause: by/through/with which, in which(where), which, that...
  - The Nonfinite Verb (非谓语动词，即各种分词形式): The iphone made by Apple has drawn great attentions from all over the world.

摘要的分句模板

- 第一句 (总)
  1. This paper proposes/presents/studies method A for/of objective B (with/subject to performance drawbacks C).
  2. In this paper, method A is proposed/presented/suggested/studied for objective B (with/subject to condition C).
- 第二句 (分 1：比较现有方法)
  1. Different with/Unlike traditional/conventional method/approach/strategy/idea/framework/methodology A which/that has characteristics B, this paper introduces/employs a new method C, such that problem/issue/risk D can be avoided/remedied.
- 第三句 (分 2：描述具体方法和贡献 1)
  1. To achieve/realize this purpose (For this purpose), method A is first developed/suggested/proposed, by which B is achieved/avoided/guaranteed. Moreover, [依个案添加细节描述].

摘要的分句模板（续）

- 第四句 (分 3：描述子方法和贡献 2)
  1. Then, X (another contribution) is introduced to achieve Y.
- 第五句 (结尾：提供证据支持——描述仿真/实验)
  1. Simulation/Experimental results are presented (simulations/experiments are carried out/conducted) to demonstrate/illustrate/validate the effectiveness/efficiency of this proposed method．[依个案添加对结果的细节描述].

Subsection 4

中英文摘要案例分析

中文案例 1

- 初版摘要：针对无线传感器网络节点只有 tue 和 fialse 两个状态的二进制一致性数据融合准确率问题，提出了一种分布式二进制间隔一致性算法．基于平均一致性思想，对于节点状态不连续的节点，根据更新结果趋近中间值的程度计算节点更新状态的概率分布，并以构想的一致性算法为适应度指标，应用遗传算法对概率分布进行优化．并结合图论知识，进行了分布式网络仿真，结果表明，所设计的算法与原来的间隔一致性算法比较，具有更好的准确率，验证了算法的有效性.
- 初版关键词：无线传感器网络；一致性；轮盘赌；遗传算法．
- 改版摘要：针对二进制一致性算法扩展性差、经验依赖性强的缺点,提出了一种 N 状态分布式二进制一致性算法．首先, 基于 Gossip 算法的平均一致性思想和轮盘赌思想, 更新无线传感器网络状态均值和当前状态均值的偏差程度, 计算所有可能更新状态的初始概率分布；然后，利用遗传算法优化初始概率分布，得到准确率较高的最优概率分布．仿真结果表明, 在相同状态个数条件下, 本文所设计的算法具有更好的准确率和收敛时间.
- 改版关键词：一致性；遗传算法；二进制；优化．

中文案例 2

- 初版摘要：针对土壤湿度固定检测不能良好反应作物区域土壤墙情信息，大量布置传感器又使的投资成本较大的问题. 设计了一种分布式土壤湿度决策支持系统．该系统由便携式土壤湿度检测装置和上位机决策软件两部分组成，其中伸携式土壤湿度检测装置使用 FDR 原理土壤水分传感器和 C8051 单片机开发设计：上位机决策软件基于 Matab 和二进制一致性算法设计．上位机决策软件对装置检测的数据进行分析处理，能够根据不同作物设定不同需水值进行决策运算．测试结果表明，系统运行良好，决策准确，开发成本低廉，适于推广应用.

中文案例 2（续）

- 改版摘要：采用最先进的技术进行精准灌溉是现代农业发展的必然趋势，但在准确预测被监测区域的土壤湿度时，面临一个两难的处境：少量上壤湿度固定检测点不能良好地反映作物区域土壤墙情信息，而大量布置传感器检测点又使得投资成本较大．因此该文设计了一种便携式土壤检测装置，同时基于该装置构建了一个精准灌溉决策系统，并把该系统应用于田间的精准灌溉决策．该系统由便携式土壤湿度检测装置和上位机决策软件 2 部分组成，其中便携式土壤湿度检测装置由 FDR 原理土壤水分传感器 MS-10、低功耗单片机 C8051F410、蓝牙无线传输模块、数据显示模块以及部分外围电路组成，可以独立实现时间记录、数据存储和实时显示．经过试验标定，装置的允许最大误差为 2.2%，设计精度为 95%；上位机决策软件分为数据接收模块、分布式二进制一致性算法模块和系统操作界面 3 子模块，分别采用 Visual Basic、Matlab 和 Matlab GUI 设计而成，实现对便携式装置所采集数据的无线传输、归一化处理和数据融合处理，能够根据不同区域划分和不同作物灌水下限进行相应的运算，从而得到估计精度较高、区域大小可调的多尺度精准灌溉决策信息．最后通过 $30m \times 30m$ 草坪的土壤湿度为检测参数的田间验证，该系统的平均决策准确率大于 90%，且可以根据需要增减检测点个数．因此既可以独立应用，也可以作为固定检测方式的有效补充，实现作物区域土壤湿度信息的精确采集，有效提高水资源利用率.

英文案例 1

- 初版摘要（请找语病）：Consider the rotor aircraft is not able to deliberately change its own shape by rearranging the connectivity of its parts for self-adapting different circumstances, tasks, or recovering from damage, a reconfiguration module aircraft which can rearrange its parts according to variable requirements is developed. In this work, a general mathematical model of flight reconfiguration module is built through using Newton's and Euler's laws. There is a structure defect in current flight reconfiguration module that the barycenter of a single module is not its geometric center due to the placement of battery-electric and circuit board devices. As a result, these constraints makes its moment of inertia becoming hard detected.Therefore. an adaptive law combing with a first-order low pass filter is proposed to estimate these parameters in order to improving estimate accuracy and the same time avoiding the measurement of high order signal. Finally. a simulation based on our model is given to show the efficiency of the proposed estimation method.

英文案例 1（续）

- 最终版摘要（请接着找可改进的地方）：Consider (that) the rotor aircraft is not able to deliberately change its own shape for self-adapting different circumstances, (and) tasks, or recovering from damage, a reconfiguration module aircraft which can rearrange its parts according to variable (various) requirements is developed. In this work, a general model of flight reconfiguration module (reconfigurable flight module) is built by using Newton's and Euler's laws. Moreover, there are some limitations to the structure such as (, for example,) the barycenter of a single module is not its geometric center due to the placement of battery-electric and circuit board devices. As a result, these constraints make its moment of inertia becoming (删掉) difficult to detect. Therefore, an adaptive law combing (combining) with a first-order low pass (low-pass) filter is proposed to estimate these parameters in order to improve estimate accuracy and at the same time avoiding (to avoid) the measurement of high order signal. Finally, a simulation based on the model is given to show the efficiency of the proposed estimation method.

英文案例 1——使用辅助工具（续, Optional）

- Chat-GPT 3.5 模型自动从初版改写的摘要（下划线标记少量人工调整，蓝色为 Chat-GPT 调整、添加的关键词汇）：A conventional rotor aircraft lacks the ability to autonomously alter its shape by reconfiguring the connectivity of its components in order to adapt to varying circumstances, tasks, or recover from damage. This paper aims to develop a reconfiguration-module aircraft which can rearrange its parts as per the requirements. In this study, a comprehensive mathematical model of aircraft reconfiguration module is developed by employing the Newton-Euler method. In addition, the current aircraft reconfiguration module is characterized by a structural flaw wherein the barycenter of a single module does not correspond to its geometric center due to the position of its battery and on-vehicle circuit modules. Consequently, these constraints make it diffcult to detect the moment of inertia. To address this issue, an adaptive law, coupled with a first-order low pass filter is proposed to estimate these parameters, thereby enhancing the accuracy of estimation and also eliminating the need to measure high-order signals. Finally, a simulation, based on our model, is presented to highlight the effciency of the proposed estimation method.

Subsection 5

摘要的写法模板

中文模板

- （对象）针对二进制一致性算法扩展性差、经验依赖性强的缺点，（方法）提出了一种 N 状态分布式二进制一致性算法．（子方法 1）首先，基于 Gossip 算法的平均一致性思想和轮盘赌思想，更新无线传感器网络状态均值和当前状态均值的偏差程度，计算所有可能更新状态的初始概率分布；（子方法 2），然后利用遗传算法优化初始概率分布，得到准确率较高的最优概率分布．（结尾：有效性证据）仿真结果表明，在相同状态个数条件下，本文所设计的算法具有更好的准确率和收敛时间.

英文模板

- (方法) This paper proposes a leader–follower formation tracking controller for (对象) underactuated autonomous marine surface vehicles with limited torque under environmental disturbances. (子方法 1) A second-order formation dynamic model is developed in the actuated degrees of freedom of the followers to simplify the design procedure. (子方法 2) Then, a formation tracking controller is designed by utilizing generalized saturation functions to reduce the risk of actuator saturation. (子方法 3) Radial basis function neural network and adaptive robust control techniques are also adopted to preserve the controller robustness against unmodeled dynamics and environmental disturbances induced by waves and ocean currents. (理论分析结果) A Lyapunov-based stability analysis shows that all signals of the closed-loop system are bounded and tracking errors are semi-globally uniformly ultimately bounded. (结尾：仿真证据支持) Finally, simulation results are provided for a group of surface vessels to illustrate the effectiveness of the proposed controller as a qualified candidate for real implementations in offshore applications.

Subsection 6

讲座小结

讲座小结

- 摘要是一篇论文的高度浓缩，怎么重视都不为过.
- 大量的阅读和写作练习是提高摘要写作能力的唯一途径.
- 初学者套用摘要模板是避免写作中的低级错误的一个有效途径.
- 写作重点在于写，只有通过动手实践才可能有提高.
- 资深写作者总能够发展出自己的个人写作风格.

第二次作业：（截止日期为第三次讲座前）

第一部分：按照本讲内容，尝试为课后附件提供的论文拟定英文标题和摘要

- 要求
  - 使用第一讲中介绍的论文阅读方法总结章节中的关键字、章节作用、逻辑连接方式等.
  - 使用本讲座中给出的摘要模板撰写摘要.
- 建议
  - 摘要不超过 400 个单词.
  - 使用 LaTex 撰写标题和摘要.

第二部分：按照本讲内容，为你本人正在撰写或构思的论文初步拟定标题（中英文不限）.

结束页

开放式讨论

问题与答疑