附件1：

大学生主题创新区创新项目发布

名称：灰色系统主题创新区

## 一、主题创新区介绍

灰色系统理论是由中国学者邓聚龙教授所原创，旨在解决现实世界广泛存在的“少数据”、“贫信息”不确定系统分析、预测、评价、决策、控制等问题。灰色系统主题创新区依托南京航空航天大学灰色系统研究所设立，该机构是是灰色系统与不确定性分析国际联合会（International Association of Grey Systems and Uncertainty Analysis, GSUA）、IEEE SMC灰色系统技术委员会和中国优选法统筹法与经济数学研究会灰色系统专业委员会的发起和挂靠单位，主编Grey Systems: Theory and Application、The Journal of Grey System 2本英文SCI期刊。团队现有指导老师12人，其中博士生导师7人，团队指导老师具有丰富的项目经验和国内外期刊发表记录，取得丰富的研究成果，享誉全球。该主题创新区提供了丰富的理论和实践相结合的选题，能够为学生提供良好的学术科研环境，拓展学生的国际视野，培养学生自主学习能力以及发现问题、分析问题、解决问题的能力，为今后的职业或科研发展奠定良好的基础。

## 二、课题介绍

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| **课题一** | |
| 指导教师： | 谢乃明（[xienaiming@nuaa.edu.cn](mailto:xienaiming@nuaa.edu.cn)） |
| 项目名称： | 基于灰色系统模型的复杂装备关键部件剩余寿命预测建模及应用 |
| 项目来源： | 自主选题 |
| 项目简介： | 随着科学技术的发展和生产工艺的进步，当代设备日益朝着大型化、复杂化、自动化以及智能化方向发展。为保障设备安全性与可靠性,剩余寿命预测技术受到了普遍关注，同时得到了广泛应用。剩余寿命预测是复杂装备运行与健康管理过程中的一大关键技术。剩余寿命预测是通过传感器、智能装置等技术手段获取设备相关数据，对设备数据进行分析和挖掘，提取有代表性、区分度高的特征，发现潜在的异常和规律，诊断设备故障并给出故障类型、严重程度、影响范围等信息。从而构建迭代结构模型预测设备剩余寿命以及使用概率性预测模型对设备失效概率进行预测。同时对预测模型进行准确性、鲁棒性、稳定性等方面的评估和验证，进一步优化模型，提高预测精度。最后对设备维修或更换策略给出建设性意见，以便提高系统设备的可靠性、安全性和经济效益。在未来，随着复杂装备的不断发展和应用，复杂装备的剩余寿命预测技术也将进一步完善和创新。 |
| 学生要求： | (1)学过预测相关的模型或算法，具备综合运用所学知识去解决实际问题的能力；  (2)具备一定编程能力；  (3)能够规范进行科研数据处理及论文撰写。 |

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| **课题二** | |
| 指导教师： | 谢乃明（[xienaiming@nuaa.edu.cn](mailto:xienaiming@nuaa.edu.cn)） |
| 项目名称： | 基于灰色系统模型的区域老龄人口总量及结构预测 |
| 项目来源： | 自主选题 |
| 项目简介： | 人口老龄化是人们普遍关心的社会问题，厘清老龄人口的总量及结构是资源有效配置的前提，本项目针对老龄人口的总量及结构预测展开理论研究，主要包括考虑多因素影响的区域人口总量预测、区域老龄人口结构占比预测、区域失能老人结构占比预测等内容。首先拟基于多变量自适应灰色自记忆GM(1,N)模型对老龄人口总量进行预测。其次，构建分数阶单变量灰色成分模型解决老龄人口占比、失能老人占比的两阶段人口结构预测问题。最后，基于精细化描述需求，在失能老人状态分类基础上，构建灰色多状态Markov链成分模型对失能老人动态转移规律进行研究。形成以“预测评估-系统仿真”为主线，“理论研究-案例分析”为研究思路的老龄人口预测综合性解决方案。 |
| 学生要求： | (1)学过灰色系统理论或时间序列建模，具备综合运用所学知识去解决实际问题的能力；  (2)具备一定编程/算法基础；  (3)能够规范进行科研数据处理及论文撰写。 |

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| **课题三** | |
| 指导教师： | 谢乃明（[xienaiming@nuaa.edu.cn](mailto:xienaiming@nuaa.edu.cn)） |
| 项目名称： | 基于灰色系统建模的供应链预测建模及优化 |
| 项目来源： | 自主选题 |
| 项目简介： | 随着全球供应链网络的不断扩大和复杂化，采用先进的数据驱动方法对供应链进行优化和预测变得至关重要。在国际化竞争环境中，单纯依靠企业内部资源的管理和开发已经无法适应环境变化的需要，激烈的市场竞争和快速多变的市场需求迫使供应商、制造商、分销商和零售商走向合作。供应链将一些原本分散的组织与功能紧密地连接起来形成一个链，已经成为企业的“第三利润源”。本项目旨在利用先进的数据科学、时间序列分析、机器学习等技术，以优化其供应链运营并提高预测准确性。通过分析大规模的供应链数据，识别潜在的瓶颈、优化供应链流程，利用数据洞察力为企业提供精准的优化建议，以降低成本、提高交付效能。通过深入研究产品层次结构、市场趋势和消费者行为，建立先进的预测模型，帮助企业更准确地预测产品需求，有助于避免过剩库存或供应短缺，建立更灵活、高效的供应链系统，提高对市场变化的适应能力，从而取得竞争优势。 |
| 学生要求： | (1)学过预测、优化相关的理论或算法，具备综合运用所学知识去解决实际问题的能力；  (2)具备一定编程能力；  (3)能够规范进行科研数据处理及论文撰写。 |

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| **课题四** | |
| 指导教师： | 谢乃明（[xienaiming@nuaa.edu.cn](mailto:xienaiming@nuaa.edu.cn)） |
| 项目名称： | 基于区间灰工时的装配线平衡优化建模与应用 |
| 项目来源： | 自主选题 |
| 项目简介： | 装配线平衡优化广泛存在于生产制造业中，也是工业工程与管理专业的一个基本问题。在现实生产生活中存在由工人熟练等级、疲劳程度、操作方式等引发的不确定性因素，为企业实施平衡优化、把控产线生产、控制瓶颈波动等造成困难。因此，考虑不确定性因素的装配线平衡优化问题对企业生产管理具有重要的意义。本创新区提出了运用区间灰数表征工时的不确定性，针对单产品与多产品两个情景，分别构建数学模型，设计算法求解，生成装配线平衡优化方案。 |
| 学生要求： | 1. 学过基本的运筹学知识、灰色系统理论知识、基础工业工程知识，具备用所学知识去解决实际问题的能力； 2. 具备一定的数学建模基础； 3. 具备较扎实的编程/算法基础； 4. 能够规范进行科研数据处理及论文撰写。 |

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| **课题五** | |
| 指导教师： | 陶良彦（[lytao@nuaa.edu.cn](mailto:lytao@nuaa.edu.cn)） |
| 项目名称： | 基于GM系列模型的项目时间和成本预测研究 |
| 项目来源： | 教师科研项目 |
| 项目简介： | 由于项目的一次性，动态性和不确定性，项目实施过程中时间和成本波动大，对其准确预测并据此提出相对应策略，将大大提升项目管理效果。本课题将对相关研究现状进行文献计量分析，梳理研究热点和趋势；进而利用公开的项目集，建立项目时间和成本的灰色预测模型，并与机器学习、基于EVM方法等其他模型进行比较分析。最后用若干实例说明所提模型的有效性和实用性。 |
| 学生要求： | 1.学生需要具备基本数理统计相关知识。2.对项目管理研究有一定兴趣。3.具有较强的责任心和团队意识。 |

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| **课题六** | |
| 指导教师： | 王俊杰（[wangjj@nuaa.edu.cn](mailto:wangjj@nuaa.edu.cn)） |
| 项目名称： | [考虑消费者偏好的新能源汽车销量预测建模及其应用研究](javascript:openframe('%E9%A2%98%E7%9B%AE%E8%AF%A6%E7%BB%86%E4%BF%A1%E6%81%AF',%20'Project/Details.html?id=20015&applyId=null%27,false)) |
| 项目来源： | 国家自然科学基金 |
| 项目简介： | 新能源汽车由于其碳排放量低于传统燃油车，对保障能源安全与实现“双碳”目标具有积极意义。目前在燃油车仍在中国汽车消费市场中占据主导地位的背景下，新能源汽车还需深入推广，其销量的影响因素有待进一步明确，从而提高预测准确度。本课题主要工作内容如下：  (1).爬取“汽车之家”，“易车”等网站关于新能源汽车的在线评论；  (2).使用NLP、情感分析等技术处理爬取到的评论数据，以提取影响新能源汽车销量的相关因素，并对提取到的相关因素量化处理；  (3).将传统影响因素和新提取到的相关因素融入到灰色多变量预测模型，对新能源汽车的销量做出预测。 |
| 学生要求： | 踏实的学习态度 |

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| **课题七** | |
| 指导教师： | 党耀国（[iamdangyg@163.com](mailto:iamdangyg@163.com)） |
| 项目名称： | 考虑冲击效应的灰色多变量预测建模及其在碳排放中的应用 |
| 项目来源： | 国家自然基金面上项目 |
| 项目简介： | 在双碳政策下，政策发布对能源消费与排放具有冲击效应，该项目考虑政策冲击下，各省域碳排放的趋势，构建考虑冲击效应的灰色多变量预测模型对其进行趋势分析。 |
| 学生要求： | 踏实的学习态度 |

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| **课题八** | |
| 指导教师： | 董文杰（[dongwenjie@nuaa.edu.cn](mailto:dongwenjie@nuaa.edu.cn)） |
| 项目名称： | 极少失效情形下复杂系统可靠性增长管理 |
| 项目来源： | 自选 |
| 项目简介： | 通过不断地消除产品在设计或制造过程中地薄弱环节，使产品可靠性随时间而逐步提高的过程，称为可靠性增长管理。可靠性增长是保证现代复杂系统投入使用后具有所要求的可靠性的一种有效途径，贯穿于系统寿命周期地各个阶段。本项目结合已有可靠性增长试验中获取的故障数据，拟应用灰色系统理论等相关科学方法，定量预测产品故障次数和可靠性增长试验终止时间，为系统的可靠性增长管理提供决策支持。 |
| 学生要求： | 具备灰色系统理论基础 |

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| **课题九** | |
| 指导教师： | 方志耕（zhigengfang@163.com） |
| 项目名称： | 基于面板数据的长寿命道路交通量灰色预测模型 |
| 项目来源： | 教师横向科研项目 |
| 项目简介： | 针对长寿命道路交通量预测的实际问题需求，利用动态系统分析和数据驱动建模方法，基于地区发展水平和发展规划等，对交通流面板数据进行剖面分析，利用多种时间序列分析方法，优化多变量灰色预测模型，预测典型道路的交通流数据变化。 |
| 学生要求： | 1.学生需要具备基本数理统计相关知识。2.对项目研究相关行业有一定兴趣。3.具有较强的责任心和团队意识。 |

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| **课题十** | |
| 指导教师： | 胡明礼(huml@nuaa.edu.cn) |
| 项目名称： | 基于分数阶灰色预测模型的能源消费预测研究 |
| 项目来源： | 自选 |
| 项目简介： | 中国是全球能源消费和碳排放第一大国，优化能源结构、加速能源绿色低碳发展是实现碳达峰、碳中和愿景的关键。统筹考虑经济发展、能源安全和碳减排目标，设置了稳健型、积极型、激进型3种可实现碳中和的情景，运用分数阶GM(1,1)模型和分数阶累加的离散灰色预测模型等模型方法对我国2024-2060年关键时间节点的能源需求与碳排放进行预测。展望碳达峰、碳中和愿景下我国能源消费中各类能源的发展趋势。 |
| 学生要求： | 具有较强的数据建模分析能力；  踏实肯干，具有团队合作精神；  修读过灰色系统课程的同学优先。 |

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| **课题十一** | |
| 指导教师： | 袁潮清(Chaoqingyuan@nuaa.edu.cn) |
| 项目名称： | 信息覆盖的视角下灰色聚类的内涵与准则 |
| 项目来源： |  |
| 项目简介： | 依据灰色不确定性的定义对采用信息覆盖对灰色聚类内涵、特征进行分析和界定，提出灰色聚类的相关准则，建立灰色聚类结果的合理性判断方法和判断标准，并进行相应案例研究。 |
| 学生要求： | 具有扎实的数学基础，英文读写流利，对学术研究热情 |

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| **课题十二** | |
| 指导教师： | 菅利荣(jianlr@nuaa.edu.cn) |
| 项目名称： | 我国先进制造业集群的现状分析及生态化发展路径研究 |
| 项目来源： | 江苏高校社科重大项目 |
| 项目简介： | 生态创新代表了一个国家的技术进步，生态创新的两大主题，即生态效率和资源效率，确保了环境、经济和社会的可持续性，已成为各国实现经济高质量发展的基本路径。从生态链的整体视角（例如资源消耗、废弃物排放、产业链的完善程度、整体的创新能力、具有自主知识产权的核心技术、绿色创新绩效等）分析我国先进制造业集群的发展现状；综合运用灰色不确定性评价方法、复杂网络方法等挖掘影响先进制造业集群绿色发展的关键影响因素及其关联关系；探究我国先进制造业集群生态化的发展路径与对策建议。 |
| 学生要求： | 一定的数理基础及计算机基础 |

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| **课题十三** | |
| 指导教师： | Ehsan Javanmardi(ejavanmardi@nuaa.edu.cn) |
| 项目名称： | Digital Payment Systems and the Elderly: Assessing the adoption and usability of digital payment systems among the elderly, and identifying key barriers and facilitators |
| 项目来源： |  |
| 项目简介： | Importance of the Research  The research on "Digital Payment Systems and the Elderly" is of paramount importance for several reasons:  Demographic Shifts: With the global population aging rapidly, a significant portion of society is potentially marginalized due to the digital divide. Understanding their interaction with digital payment systems is crucial for ensuring their inclusion in the digital economy.  Financial Independence and Inclusion: This research will contribute to enhancing financial independence and inclusion for the elderly. By addressing the barriers they face in using digital payment systems, we can empower them to manage their finances more effectively and securely.  User-Centric Design: The findings will provide invaluable insights for designing user-friendly digital payment systems that cater to the needs of the elderly, fostering a more inclusive digital landscape.  Policy and Regulation: The results can inform policymakers and regulatory bodies to develop guidelines and frameworks that ensure the digital financial ecosystem is accessible and equitable for all age groups.  Technological Advancement: Understanding the unique needs and challenges faced by the elderly can drive innovation in technology, leading to the development of new, more accessible digital payment solutions.  Social Well-being: Enhancing the ability of the elderly to use digital payment systems can improve their social well-being by reducing feelings of dependency and increasing their engagement with the community.  Goals of the Research  The primary goals of this research are:  Assess Adoption Rates: To determine the current level of adoption of digital payment systems among the elderly.  Identify Usability Challenges: To uncover and understand the specific usability challenges that the elderly face in using digital payment systems.  Discover Barriers and Facilitators: To identify the key barriers that hinder and facilitators that encourage the adoption of digital payment systems by the elderly.  Develop Recommendations: To propose actionable recommendations for improving the accessibility and usability of digital payment systems for the elderly.  Inform Stakeholders: To provide stakeholders, including technology developers, financial institutions, and policymakers, with data-driven insights for decision-making.  Promote Digital Literacy: To contribute to efforts in enhancing digital literacy among the elderly, ensuring they can participate fully in the digital world.  Why We Should Conduct This Research:  Conducting this research is essential for several reasons:  Addressing a Growing Need: As the elderly population grows, their needs and challenges in accessing and using digital technologies become more pressing.  Bridging the Digital Divide: This research is a step towards bridging the digital divide, ensuring that advancements in technology are inclusive and beneficial to all segments of society, including the elderly.  Enhancing Quality of Life: By making digital payment systems more accessible to the elderly, we can significantly enhance their quality of life and independence.  Driving Inclusive Innovation: The insights gained can drive innovation in digital payment technology, leading to more inclusive and user-friendly designs.  Social Responsibility: It is a social imperative to ensure that the benefits of digital technology are accessible to all, including the elderly, who are often at risk of being left behind in the digital era.  Objective:  The primary objective of this research is to comprehensively assess how the elderly population adopts and interacts with digital payment systems. This study aims to explore the usability of these systems for senior citizens and identify the main barriers and facilitators influencing their adoption.  Key Research Questions:  What is the current level of adoption of digital payment systems among the elderly?  What are the primary usability challenges faced by elderly users when interacting with digital payment platforms?  How do factors like technology literacy, trust, security concerns, and perceived usefulness influence the adoption of digital payment systems by the elderly?  What are the main facilitators that could enhance the adoption and usability of digital payment systems for senior citizens?  How do socioeconomic factors, such as income level, education, and urban vs. rural residency, impact the use of digital payment methods among the elderly?  Methodology:  Quantitative Surveys: Conduct surveys with a diverse group of elderly participants to quantify the level of adoption and identify patterns in usage and preferences.  Qualitative Interviews: Carry out in-depth interviews to gain detailed insights into personal experiences, challenges, and perceptions regarding digital payment systems.  Usability Testing: Perform usability tests with elderly participants to observe and document their interactions with various digital payment platforms.  Comparative Analysis: Compare adoption rates and usability experiences across different demographic groups within the elderly population.  Expected Outcomes:  A detailed understanding of the current adoption rate of digital payment systems among the elderly.  Identification of key usability challenges and barriers hindering the use of digital payment systems by senior citizens.  Insights into the role of personal, social, and economic factors in influencing the adoption of digital payments.  Recommendations for designing or modifying digital payment systems to be more elderly-friendly.  Strategic recommendations for policymakers, financial institutions, and technology developers to increase the adoption and improve the usability of digital payment systems for the elderly.  Significance:  This research is particularly significant in an increasingly digitized world where digital payment systems are becoming essential for various transactions. Understanding the specific needs and challenges of the elderly in this context is crucial to ensure their inclusion and prevent further widening of the digital divide. The findings can inform the development of more accessible, user-friendly payment solutions that cater to the needs of the aging population, thus fostering their independence and financial empowerment. |
| 学生要求： | Students need capabilities in both quantitative and qualitative business research methods including surveys, interviews, and analysis.  Students should demonstrate understanding of emerging Industry 4.0 technologies and applications in elderly care. Familiarity with healthcare systems, aging population trends, and assisted living is desired.  Students should exhibit analytical skills to synthesize research findings into strategic insights for elderly care businesses, policymakers, and technology companies. |

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| **课题十四** | |
| 指导教师： | Ehsan Javanmardi(ejavanmardi@nuaa.edu.cn) |
| 项目名称： | Addressing the Digital Divide Among the Elderly, Analyzing the digital divide and its impact on elderly consumers' access to and engagement with e-business platforms |
| 项目来源： |  |
| 项目简介： | The term "Digital Divide" refers to the gap between individuals, households, businesses, and geographic areas at different socio-economic levels with regard to their access to information and communication technologies (ICT), and their use of the Internet for a wide variety of activities. This divide can exist on several levels:  Access Divide: This is the most basic level of the digital divide and refers to the gap between those who have or do not have access to digital technology and the Internet. It is often influenced by factors such as geography (urban vs. rural), income, and infrastructure availability.  Usage Divide: Even among those who have access to technology and the internet, there can be differences in how these tools are used. For instance, some might use the internet only for social media and entertainment, while others use it for educational purposes, professional development, or engaging in e-commerce.  Knowledge and Skills Divide: This aspect of the digital divide refers to the differences in digital literacy and the ability to use ICT effectively. People with higher digital literacy can take full advantage of the benefits of the internet and digital tools, whereas those without these skills are limited in their usage.  Socioeconomic Divide: This dimension of the digital divide is related to differences in socio-economic status, which can affect both access to and the ability to use digital technologies. Individuals from lower socio-economic backgrounds might struggle more with both access and utilization of digital technologies.  The digital divide is a significant issue because it can perpetuate and even exacerbate existing social and economic inequalities. It is particularly relevant in discussions about the elderly, as they are often at a disadvantage in terms of digital literacy and access to technology, thus potentially being marginalized in an increasingly digital world. Efforts to bridge the digital divide often focus on improving infrastructure, increasing affordability of technology, and providing education and training to enhance digital literacy.  Background  The rapid evolution of e-business has transformed the way consumers interact with products and services. However, this digital transformation has not been uniformly accessible to all demographics, particularly the elderly. As e-business becomes increasingly essential for daily transactions, shopping, and accessing services, the issue of the digital divide - the gap in access to and proficiency with digital technology - becomes more pronounced among elderly consumers. This demographic often faces unique challenges, including limited digital literacy, accessibility issues, and reluctance to adopt new technologies.  The elderly population is growing globally, making it imperative to address these disparities. Without intervention, the digital divide can lead to social exclusion, reduced access to essential services, and diminished quality of life for elderly individuals. Understanding the barriers and facilitators to e-business engagement among the elderly is crucial for developing inclusive digital platforms and ensuring equitable access to digital services.  Research Direction  Objective:  The primary objective of this research is to analyze the digital divide and its impact on elderly consumers' access to and engagement with e-business platforms. The study aims to identify key barriers and facilitators influencing their participation in the digital marketplace.  Key Research Questions:  What are the main barriers preventing elderly consumers from accessing and effectively using e-business platforms?  How does the level of digital literacy among the elderly impact their engagement with e-business?  What are the perceptions and attitudes of elderly consumers towards e-business, and how do these influence their adoption of digital services?  What role do factors like trust, privacy concerns, and user interface design play in the e-business engagement of the elderly?  Methodology:  Quantitative Surveys: Conduct structured surveys to quantify the extent of e-business use among the elderly and to identify common barriers.  Qualitative Interviews: Perform in-depth interviews with elderly individuals to gain nuanced insights into their experiences and perceptions.  Usability Testing: Assess the usability of various e-business platforms for elderly users to identify specific design and navigation issues.  Comparative Analysis: Compare the engagement levels and challenges across different demographics within the elderly population.  Expected Outcomes:  A detailed understanding of the digital divide affecting elderly consumers in the context of e-business.  Identification of key barriers to e-business accessibility and suggestions for overcoming these obstacles.  Recommendations for designing e-business platforms that are more accessible and user-friendly for the elderly.  Insights for policymakers and businesses on strategies to increase digital inclusion for elderly consumers.  Significance:  This research is critical in an increasingly digitized world, where equitable access to digital platforms is essential for social inclusion and economic participation. By addressing the digital divide among the elderly, the study aims to contribute to the development of more inclusive e-business practices and policies, ensuring that the benefits of digital transformation are accessible to all age groups. The findings will not only enhance our understanding of elderly consumers in the digital economy but also inform the creation of more age-friendly digital environments.  Main Technical Targets for "E-Business Accessibility: Addressing the Digital Divide Among the Elderly"  Comprehensive Data Collection:  Gathering detailed data on elderly consumers' access to and use of e-business platforms.  Ensuring a representative sample that reflects various demographics within the elderly population.  High-Quality Data Analysis:  Utilizing robust statistical and thematic analysis methods to accurately interpret the data.  Ensuring the reliability and validity of findings.  User Experience Evaluation:  Assessing the usability and accessibility of e-business platforms for elderly users.  Identifying specific design and navigation challenges faced by the elderly.  Digital Literacy Assessment:  Evaluating the level of digital literacy among elderly consumers and its impact on e-business engagement.  Barrier Identification and Solution Development:  Identifying key barriers to e-business accessibility for the elderly.  Proposing practical solutions and recommendations for enhancing accessibility.  Research Methods  Quantitative Research:  Surveys: Conducting structured surveys with elderly individuals to gather quantitative data on e-business usage, preferences, and challenges.  Statistical Analysis: Using statistical tools to analyze survey data, identify patterns, and draw conclusions.  Qualitative Research:  Interviews: Carrying out in-depth interviews with elderly users to gain insights into their experiences, perceptions, and attitudes towards e-business.  Focus Groups: Facilitating focus group discussions to explore diverse viewpoints and experiences among the elderly regarding e-business platforms.  Usability Testing:  Task-Based Analysis: Observing elderly individuals as they perform specific tasks on e-business platforms to identify usability issues.  Heuristic Evaluation: Evaluating e-business platforms against established usability principles tailored to the elderly.  Ethnographic Methods:  Observational Studies: Observing elderly users in their natural settings to understand real-world e-business interactions.  Diary Studies: Asking participants to maintain diaries of their e-business activities to gather longitudinal data.  Digital Literacy Assessment:  Skill Evaluation: Assessing the digital skills and competencies of elderly users in relation to e-business platforms.  Training and Support Needs Analysis: Identifying gaps in knowledge and the types of support needed to enhance digital literacy.  Cross-Sectional and Comparative Studies:  Comparative Analysis: Comparing e-business use and accessibility across different age groups, regions, and socio-economic backgrounds.  Document Analysis:  Reviewing existing policies, guidelines, and literature related to e-business accessibility and the digital divide.  These methods will collectively provide a comprehensive understanding of how the digital divide impacts elderly consumers' access to and engagement with e-business platforms. The study aims to identify barriers, assess user experiences, and propose actionable solutions to enhance digital accessibility for the elderly in the realm of e-business. |
| 学生要求： | Students need capabilities in both quantitative and qualitative business research methods including surveys, interviews, and analysis.  Students should demonstrate understanding of emerging Industry 4.0 technologies and applications in elderly care. Familiarity with healthcare systems, aging population trends, and assisted living is desired.  Students should exhibit analytical skills to synthesize research findings into strategic insights for elderly care businesses, policymakers, and technology companies. |

## 三、报名组队事宜

报名截止日期是2024年2月28日；

报名形式为团队报名，请先与指导教师邮箱联系；

后续通知，请加入QQ群（287460922）。

