

课程详述

COURSE SPECIFICATION

以下课程信息可能根据实际授课需要或在课程检讨之后产生变动。如对课程有任何疑问，请联系授课教师。

The course information as follows may be subject to change, either during the session because of unforeseen circumstances, or following review of the course at the end of the session. Queries about the course should be directed to the course instructor.

1.	课程名称 Course Title	认知科学导论实验 Introduction to Cognitive Science Lab
2.	授课院系 Originating Department	计算机科学与工程系 Department of Computer Science and Engineering
3.	课程编号 Course Code	CS105
4.	课程学分 Credit Value	1
5.	课程类别 Course Type	专业选修课 Major Foundational Courses 智能科学与技术 专业选修课 Major Elective Courses 计算机科学与技术
6.	授课学期 Semester	秋季 Fall
7.	授课语言 Teaching Language	中英双语 English & Chinese
8.	授课教师、所属学系、联系方式 (如属团队授课, 请列明其他授课教师) Instructor(s), Affiliation & Contact (For team teaching, please list all instructors)	宋轩, 副教授, 计算机科学与工程系, songx@sustech.edu.cn Xuan Song, Associate Professor, Department of Computer Science and Engineering, songx@sustech.edu.cn
9.	实验员/助教、所属学系、联系方式 Tutor/TA(s), Contact	无 NA / 待公布 To be announced / 已确定的实验员/助教联系方式 Please list all Tutor/TA(s) 待公布 To be announced
10.	选课人数限额(可不填) Maximum Enrolment (Optional)	

11. 授课方式 Delivery Method	讲授 Lectures	习题/辅导/讨论 Tutorials	实验/实习 Lab/Practical	其它(请具体注明) Other (Please specify)	总学时 Total
			32		32
12. 先修课程、其它学习要求 Pre-requisites or Other Academic Requirements	Co- requisites 认知科学导论 Introduction to Cognitive Science				
	CS303 人工智能 Artificial Intelligence 计算机视觉 Computer Vision 机器学习 Machine Learning 深度学习 Deep Learning CS401 智能机器人 Intelligent Robots				
13. 后续课程、其它学习规划 Courses for which this course is a pre-requisite					
14. 其它要求修读本课程的学系 Cross-listing Dept.					

教学大纲及教学日历 SYLLABUS

15. 教学目标 Course Objectives

认知科学是一门研究信息如何在大脑中形成以及人脑认知过程中的复杂计算模型。它研究何为认知，认知有何用途以及它如何工作；研究信息如何表现为感觉、语言、注意、推理和情感以及背后的计算模型和原理。其研究领域包括人工智能，心理学、哲学、神经科学、学习、语言学、人类学、社会学和教育学等。

认知科学导论实验课用于提供给学生们一个在认知科学课程中的基本概念、假设、模型、方法、挑战以及各类应用的一个实践平台。本实验课程将着重培养学生处理认知科学相关数据的基本功以及从事认知科学研究的创新型思维。

Cognitive science is the interdisciplinary, scientific study of the mind and its processes. It examines the nature, the tasks, and the functions of cognition (in a broad sense). Cognitive scientists study intelligence and behavior, with a focus on how nervous systems represent, process, and transform information. Mental faculties of concern to cognitive scientists include language, perception, memory, attention, reasoning, and emotion; to understand these faculties, cognitive scientists borrow from fields such as artificial intelligence, linguistics, psychology, philosophy, neuroscience, and anthropology.

Introduction to Cognitive Science Lab aims at providing students a practice platform to the basic concepts hypotheses, models, methods, issues, and applications. This Lab will focus on improving students' ability to handle data about cognitive science and students' original creativity.

16. 预达学习成果 Learning Outcomes

通过本课程的学习，学生掌握认知科学和人工智能的基本概念、数据处理的相关方法，并在此基础上可以修习计算机科学与技术专业和智能科学与技术专业的其它高级类课程。此外，在此课程上学习的认知科学和人工智能的相关知识可以帮助学生理解与认知机理和机器智能相关的更多高级应用：如计算机视觉，机器学习，深度学习，人机交互，信息系统，智能机器人等。

By the end of the course, the students should know enough knowledges on cognitive science and artificial

intelligence and some methods to processing cognitive data that the student can take advanced courses in computer science as well as the artificial intelligence specialization. Further, the knowledge and understanding acquired through this course should inform student's subsequent work on any application related to cognitive science and artificial intelligence, including computer vision, Machine Learning, Deep Learning, human-computer interaction, information system design, intelligent robots, etc.

17. 课程内容及教学日历（如授课语言以英文为主，则课程内容介绍可以用英文；如团队教学或模块教学，教学日历须注明主讲人）

Course Contents (in Parts/Chapters/Sections/Weeks. Please notify name of instructor for course section(s), if this is a team teaching or module course.)

第一周实验课：介绍 Python 以及 Python IDE 环境的安装

第二周实验课：文本文件的读写操作

第三周实验课：数据清洗 I

第四周实验课：数据清洗 II

第五周实验课：绘制数据图

第六周实验课：介绍颜色在数据可视化过程中的使用

第七周实验课：认知科学相关数据的介绍

第八周实验课：对时序数据的介绍

第九周实验课：期中考试（项目中期报告）

第十周实验课：期中考试（项目中期报告）

第十一周实验课：认知科学中的数据收集

第十二周实验课：选择合适的图表进行可视化

第十三周实验课：交互式可视化设计

第十四周实验课：项目最终报告和答辩

第十五周实验课：项目最终报告和答辩

第十六周实验课：复习

Lab 1: Introduction to Python and Installation of the Python IDE

Lab 2: Reading and Writing Data in Text Format

Lab 3: Data Cleaning I

Lab 4: Data Cleaning II

Lab 5: Plotting Data on a Graph

Lab 6: The use of Color in Data Visualization

Lab 7: A look on Cognitive Science Related Data

Lab 8: Introduction to time-series data

Lab 9: Mid-term Project Presentation

Lab 10: Mid-term Project Presentation

Lab 11: Data collection in Cognitive Science

Lab 12: Choose the right Graph

Lab 13: Interactive Design

Lab 14: Final Project Presentation

Lab 15: Final Project Presentation

Lab 16: Review

18. 教材及其它参考资料 **Textbook and Supplementary Readings**

McKinney, W. (2012). Python for data analysis: Data wrangling with Pandas, NumPy, and IPython. " O'Reilly Media, Inc.".

Kirk, A. (2019). Data visualisation: A handbook for data driven design. Los Angeles: Sage Publications.

课程评估 **ASSESSMENT**

19. 评估形式 Type of Assessment	评估时间 Time	占考试总成绩百分比 % of final score	违纪处罚 Penalty	备注 Notes
出勤 Attendance		10%		出勤 Attendance
课堂表现 Class Performance				
小测验 Quiz				
课程项目 Projects		50%		完成一个完整课程项目 Lab Projects
平时作业 Assignments		40%		平时上机实验完成情况 Lab Assignments
期中考试 Mid-Term Test				
期末考试 Final Exam				

期末报告

Final
Presentation

其它（可根据需要
改写以上评估方
式）

Others (The
above may be
modified as
necessary)

20. 记分方式 **GRADING SYSTEM**

A. 十三级等级制 **Letter Grading**

B. 二级记分制（通过/不通过） **Pass/Fail Grading**

课程审批 **REVIEW AND APPROVAL**

21. 本课程设置已经过以下责任人/委员会审议通过

This Course has been approved by the following person or committee of authority

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