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| 课程编号 | 01510243 | 课程名： | | 大数据与机器智能 | | |
| 总学时： | 96  Total hours: 96 | 总学分： | | 3  Total credits: 3 | | |
| 课程内容简介： | 通过对计算和智能计算的基本原理的学习，在课程中掌握python编程，实践机器智能的实验，完成机器智能的课程项目。 通过对机器智能系统的实践，在实践中掌握TensorFlow2机器学习技术，实践TensorFlow2的人工智能应用，如计算机视觉、语音识别等。 为学生理清人工智能产业发展方向，了解人工智能产业的生态，各种技术工具及应用，拓展对人工智能产业的认识视野，培养人工智能产业的创新与创业能力。 | | | |
| Course Description | This course is teaching students to use Python, and TensorFlow2 in learning the principle of machine intelligent system. Python is a popular language in data science and machine learning and TensorFlow2 is a popular library for machine learning using Python as frontend. This course introduces Python in programming practice, and students will be instructed to programming practice based on Jupyter notebook. Tensorflow2 is a popular machine learning library. Students will be instructed to use TensorFlow2 and Keras to build deep models of MLP, convolutional network and recurrent networks to solve speech recognition, computer vision task and natural language processing etc. | | | |
| 进度安排： | 第一周 ：课程简介，Markdown, Git， Markdown/Git练习  第二周 ：Python语言基础，Python库介绍，Numpy库介绍 Python 程序  第三周 ：机器智能：深度学习1 神经元 Numpy, Matplotlib  第四周 ：机器智能：深度学习2 多层网络 TensorFlow2 playground  第五周 ：机器智能：深度学习3 TensorFlow2 进阶  第六周 ：机器智能：深度学习4 TensorFlow2  第七周 ：机器智能：深度学习5 TensorFlow2 Keras  第八周 ：机器智能：深度学习6 卷积网络CNN  第九周 ：机器智能：深度学习7 循环网络RNN  第十周 ：机器智能：深度学习应用-1 RNN续， 自然语言处理 NLP  第十一周 ：机器智能：深度学习应用-2 语音识别Audio  第十二周 ：机器智能：深度学习应用-3 计算机视觉CV  第十三周 ：机器智能总览：强化学习及其它方法  第十四周 ：课程项目  第十五周 ：课程交流参观  ## 大作业  第六周：构建、训练网络模型 实践  第十周：专题探讨 专题  Schedule: Week 1: Course introduction, Markdown, Git, Markdown/Git exercises  Week 2: Python Language Basics, introduction to Python libraries, Numpy library introduction to Python programs  Week 3: Machine Intelligence: Deep Learning 1 Neuron Numpy, Matplotlib  Week 4: Machine Intelligence: Deep Learning 2 Multi-layer network TensorFlow2 playground  Week 5: Machine Intelligence: Deep Learning 3 TensorFlow2 Advanced  Week 6: Machine Intelligence: Deep Learning 4 TensorFlow2  Week 7: Machine Intelligence: Deep Learning 5 TensorFlow2 Keras  Week 8: Machine Intelligence: Deep Learning 6 Convolutional Networks CNN  Week 9: Machine Intelligence: Deep Learning 7 Cyclic Network RNNS  Week 10: Machine Intelligence: Deep Learning Applications -1 RNN continued, Natural Language Processing NLP  Week 11: Machine Intelligence: Deep Learning Applications -2 Speech Recognition Audio  Week 12: Machine Intelligence: Deep Learning Applications -3 Computer Vision CV  Week 13: Overview of Machine Intelligence: reinforcement Learning and Other approaches  Week 14: Course project  Week 15: Course exchange visit  ## Projects  Week 6: Build and train network model practice  Week 10: Topics Explore topics |  |  | | |
| 考核方式： | 考察 | 教材及参考书： | | 1. 奥雷利安·杰龙（Aurélien Géron）, 机器学习实战：基于Scikit-Learn、Keras和TensorFlow（原书第2版），机械工业出版社，2020-10. 2. Ian Goodfellow, Yoshua Bengio, Aaron Courville, Deep Learning, MIT Press, Cambridge, MA, 2016. | | |
| 合开教师： | 郭敏、章屹松、马晓东、王浩宇  Co-teachers: Guo Min, Zhang Yisong, Ma Xiaodong, Wang Haoyu | 选课指导： | | 大二及大二以上的本科学生，一般工科背景。  Course selection guide: sophomore and above undergraduate students, general engineering background. | | |
| 先修要求： | 有一门编程语言的经验。 已学过高等数学、线性代数和概率论。  Prerequisite: Experience in a programming language. He has studied advanced mathematics, linear algebra and probability theory. | 教师教学特色： | | 课程设计了教学和实践环节。 通过实践操作巩固教学内容。逐步深入的编程练习带着大家一步一步掌握Python和TensorFlow2.  Teachers teaching characteristics: the curriculum design of teaching and practice links. Consolidate the teaching content through practical operation. Step-by-step programming exercises take you step by step through Python and TensorFlow2. | | |
| Office Hour： | 周六上午9点~11点。  Office Hour: Saturday from 9 am to 11 am. | 成绩评定标准： | | 课程项目的创新性、完整度和可行性等综合指标评判。  Grade evaluation criteria: the curriculum project innovation, integrity and feasibility of the comprehensive index evaluation. | | |