|  |  |  |  |
| --- | --- | --- | --- |
| Chen Zhen | | Big Data and Machine Intelligence | |
| total hours | 96 | total credits | 3 |
| 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. | | |
| Schedule | Week 1: Course Introduction, Markdown, Git, Markdown/Git PracticeWeek 2: Python Language Basics, Introduction to Python Libraries, Introduction to Numpy Library, Python ProgramWeek 3: Machine Intelligence: Deep Learning 1 - Neurons, Numpy, MatplotlibWeek 4: Machine Intelligence: Deep Learning 2 - Multi-layer Networks, TensorFlow 2 PlaygroundWeek 5: Machine Intelligence: Deep Learning 3 - Advanced TensorFlow 2Week 6: Machine Intelligence: Deep Learning 4 - TensorFlow 2Week 7: Machine Intelligence: Deep Learning 5 - TensorFlow 2 KerasWeek 8: Machine Intelligence: Deep Learning 6 - Convolutional Neural Networks (CNN)Week 9: Machine Intelligence: Deep Learning 7 - Recurrent Neural Networks (RNN)Week 10: Machine Intelligence: Deep Learning Applications - 1, Continued RNN, 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 MethodsWeek 14: Course ProjectWeek 15: Course Communication and Visit  Major Assignment:Week 6: Constructing and Training Network Models, PracticeWeek 10: Special Discussion, Topic Discussion | | |
| Assessment Methods | Assessment | 教材及参考书： | Textbooks and Reference Books:  1. Aurélien Géron, Hands-On Machine Learning with Scikit-Learn, Keras, and TensorFlow, 2nd Edition, Mechanical Industry Press, October 2020.  2. Ian Goodfellow, Yoshua Bengio, and Aaron Courville, Deep Learning, MIT Press, Cambridge, MA, 2016. |
| Joint Instructors | Guo Min, Zhang Yisong, Ma Xiaodong, Wang Haoyu | Course Guidance | Undergraduate students from sophomore year and above, with a general background in engineering. |
| Prerequisites | Experience with at least one programming language. Knowledge of advanced mathematics, linear algebra, and probability theory. | Teaching Features of the Instructors | The course is designed with both teaching and practical components. Practical operations are used to consolidate teaching content. Gradually deepening programming exercises guide everyone step by step to master Python and TensorFlow 2. |
| Office Hour： | Saturday morning from 9 am to 11 am. | Grading Criteria | The course project will be assessed based on innovation, completeness, feasibility, and other comprehensive indicators. |