

**Course Syllabus**  
**Ph.D. Program in Department of Business Administration**  
**College of Management**  
**National Chung Cheng University**  
**Spring 2021**

**Basic information:**

Course Name: Management and Innovation for Artificial Intelligence (人工智慧管理與創新)

Course Code: 5205005

Credit: 3 (Elective Subject)

Instructor: Dr. Tony, Cheng-Kui Huang (黃正魁)

Email: [bmahck@ccu.edu.tw](mailto:bmahck@ccu.edu.tw)

Phone: 05-2720411 ext. 34319

Instructor Office: 4563

Location: 4561

Web: <http://140.123.169.58:88/>

**Instructional objective:**

The idea of Artificial Intelligence (AI) has been early proposed since the 1940s; yet, it cannot be effectively used in human life because of the computing and storage capabilities of information technology. However, in recent years, due to the tremendous enhancement of hardware computing, storage technology, and network capabilities, AI is able to start to run a lot in our life, and deeply affect the human work style, learning education, and management. In the current AI curriculum design, most of talks are with respect to AI's technical algorithms; nevertheless, in the management curriculum planning, there are few or even no courses to explore how to help managers to face this wave of AI. Managers should further handle AI effectively by understanding and analyzing it and employ AI to innovate business models.

The design of this course is carried out in the following four ways. First, we are going to assist our students to learn more about the related technologies and algorithms of AI (machine learning). Second, we will discuss AI based on its basic technical knowledge. How to use the ability of AI to manage and innovate enterprises and industries, and employ the project management methodology to explore how to introduce AI into enterprises. Third, we will discuss AI on social issues, laws, ethics, and the influence of philosophy. Ultimately, we are going to investigate together and report on AI-related paper studies.

**Referred books:**

1. 人工智慧基礎 (Fundamentals of Artificial Intelligence), 湯曉鷗、陳玉琨 主編, 五南圖書, 2019/05 (初版一刷)。
2. Russell, S., Norvig, P. (2009). *Artificial Intelligence: A Modern Approach (Third Edition)*, Prentice Hall, 2009.
  - 人工智慧—現代方法 (Artificial Intelligence: A Modern Approach, 3/e), Stuart Russell, Peter Norvig 著、歐崇明、時文中、陳龍 譯, 全華圖書, 2011/03/03。(Artificial Intelligence: A Modern Approach 原文書之中文翻譯本)
3. Ian Goodfellow, Yoshua Bengio, Aaron Courville. (2016/11/18). *Deep Learning*, The MIT Press.
4. Deep learning 深度學習必讀: Keras 大神帶你用 Python 實作, François Chollet 著, 葉欣睿 譯, 旗標, 2019/05/31。
  - 原文書: François Chollet. (2017). *Deep Learning with Python*, Manning Publications.
5. Andrew Trask. (2019). *Grokking Deep Learning*, Manning Publications.

6. Deep Learning: 用 Python 進行深度學習的基礎理論實作, 齋藤康毅 著, 吳嘉芳 譯, 歐萊禮, 2017/08/17。
7. Deep Learning 深度學習基礎 | 設計下一代人工智慧演算法, Nikhil Buduma 著, 藍子軒 譯, 歐萊禮, 2018/06/19。
8. 實戰 TensorFlow: Google 深度學習系統, 黃文堅、唐源, 基峰, 2017/08/08。
9. Bartneck, C., Lütge, C., Wagner, A., Welsh, S. (2021). *An Introduction to Ethics in Robotics and AI*, Springer, Free e-Book, <https://www.springer.com/gp/book/9783030511098>.
10. 機器人也是人: 人工智能時代的法律, John Frank Weaver 著, 鄭志峰 譯, 元照出版公司, 2018/05/01。
11. 人工智慧相關法律議題芻議, 劉靜怡 主編, 劉靜怡·顏厥安·吳從周·李榮耕·邱文聰·沈宗倫·黃居正 著, 元照出版公司, 2018/11。
12. 正義: 一場思辨之旅, Michael J. Sandel 著, 陳信宏 譯, 先覺, 2018/09/06。
13. 創新是一種態度: 翟本喬透視問題、勇於突破的思考模式和勝出策略, 翟本喬, 商周出版, 2015/06/04。
14. 人工智慧在台灣: 產業轉型的契機與挑戰, 陳昇瑋、溫怡玲, 天下雜誌, 2019/06/04。
15. Journal paper, Conference paper, Research report, Internet, Newspaper, and Magazine
16. Popular science books, please see as the following.

#### **How to progress the course:**

Teaching 50%, Oral Presentation 20%, Discussion 30%

#### **Grade distribution – Your grade will be determined based on the following criteria:**

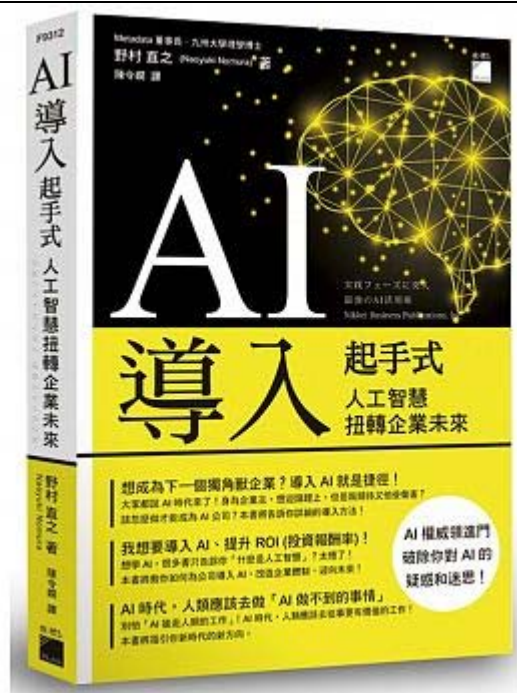
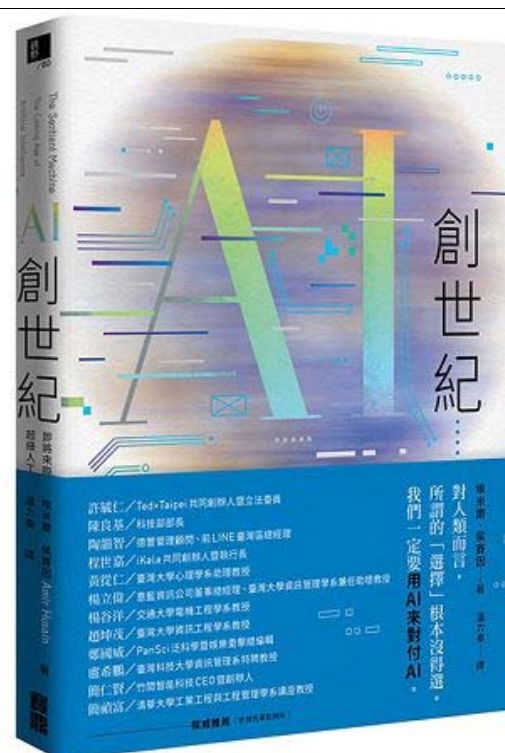
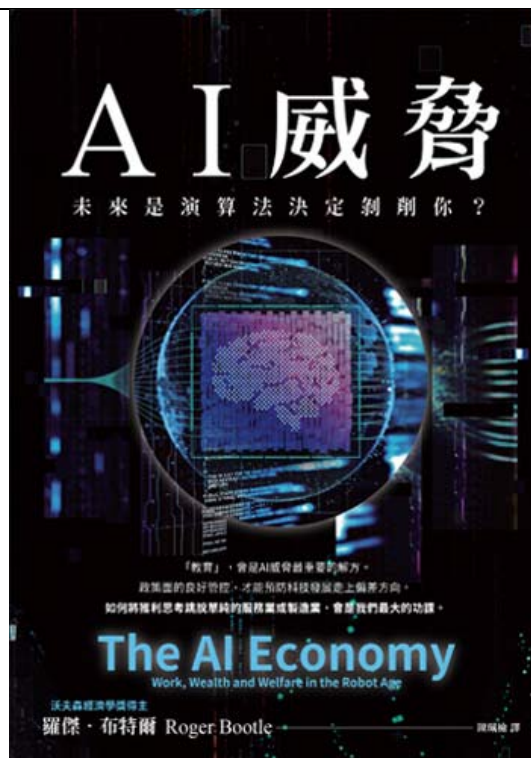
Class participation 10%, Term paper 40%, Oral presentation 50%

**Course Schedule (Tentative and might be adjusted depending on the course progress)**

Week	Date	Lecture Topic	Reading
Week 1	02/22	1. Introduction to the course 2. The first speech in Taiwan: Dr. Andrew Ng (吳恩達 博士) Title: What's next in AI (Aug. 30, 2019) Source: <a href="https://www.youtube.com/watch?v=aFDVw8I5v9Q">https://www.youtube.com/watch?v=aFDVw8I5v9Q</a>	
Week 2	03/01	Introduction to algorithms and artificial intelligence (AI)	
Week 3	03/08	(1) Introduction to regression (2) Errors from bias and variance (3) Concept of gradient descent	Requiring knowledge of linear algebra and partial differential
Week 4	03/15	Introduction to classification (logistic regression), deep learning, and backpropagation	
Week 5	03/22	(1) Introduction to reinforcement learning (2) Introduction to recurrent neural network (RNN) (3) (Optional) Introduction to convolutional neural network (CNN)	
Week 6	03/29	(1) Introduction to explainable AI (2) (Optional) Introduction to generative adversarial network (GAN)	
Week 7	04/05	No Class (校際活動)	
Week 8	04/12	(1) Introduction to TensorFlow and how to install it (2) TensorFlow usage	Practical combat for TensorFlow: Google deep learning system
Week 9	04/19	Practice of neural network: Using TensorFlow	Practical combat for TensorFlow: Google deep learning system
Week 10	04/26	(1) Application discussion on artificial intelligence + big data + artificial intelligence	

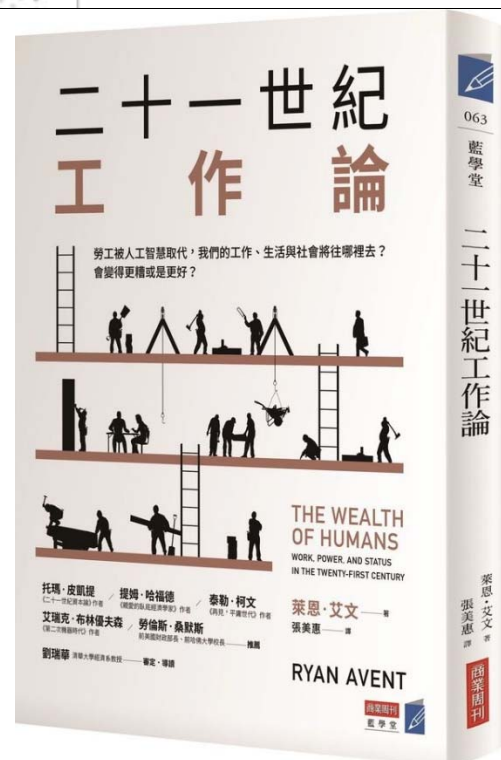
		of thing (AIoT) (2) Any new business model for AI, big data, and AIoT?	
Week 11	05/03	(1) Application discussion on artificial intelligence + medical and healthcare management (2) Any new business model for AI and medical and healthcare management?	
Week 12	05/10	Topic discussion for AI business models: Operational and manufacturing industry / financial service industry	
Week 13	05/17	Project management methodology: How to introduce AI projects into enterprises	
Week 14	05/24	(1) Introduction to strong AI / artificial generalized intelligence (AGI) and weak AI / artificial narrow intelligence (ANI) (2) Discussion on AI philosophy, AI ethics, and AI law issues	Justice – What’s the Right Thing to Do? (Michael J. Sandel)
Week 15	05/31	(1) Discussion on AI and economic issues (2) Discussion on AI and society issues	
Week 16	06/07	AI papers reading and oral presentation	
Week 17	06/14	AI papers reading and oral presentation	
Week 18	06/21	Academic or practical speech	

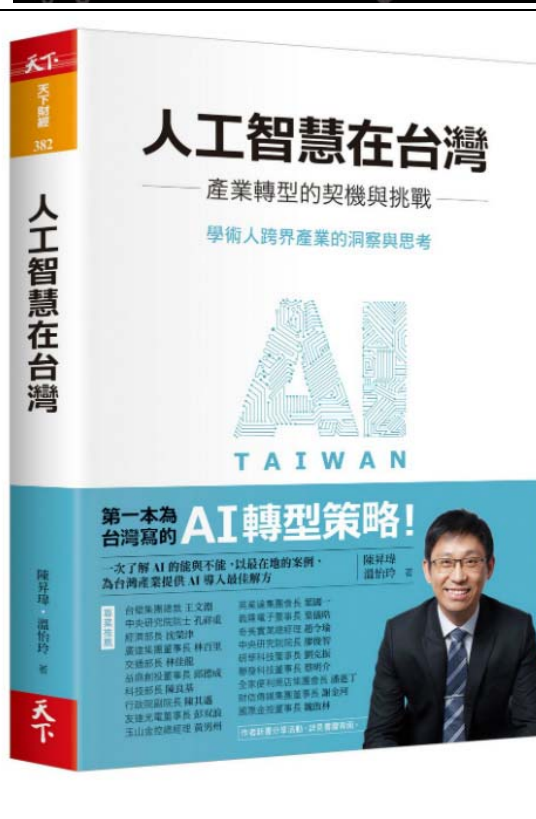
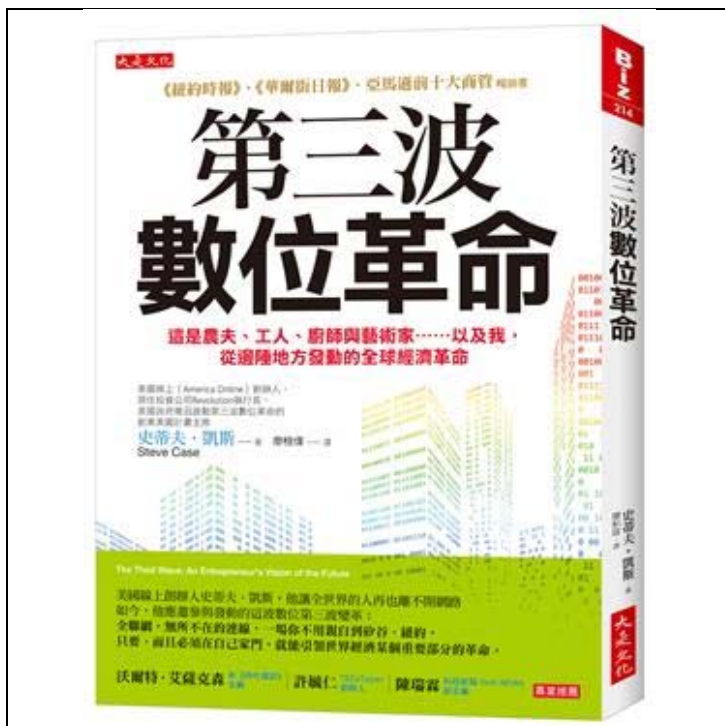
參考科普書籍：













# 21世紀的 21堂課

by Yuval Noah Harari  
《人類大歷史》與《人類大命運》作者  
哈拉瑞 著



21 Lessons  
for the  
21<sup>st</sup> Century

林俊宏 譯

HARNESSING  
OUR DIGITAL FUTURE

# 機器平台群眾 MACHINE PLATFORM CROWD

ANDREW McAfee 安德魯·麥克費  
ERIK BRYNJOLFSSON 艾瑞克·布林優夫森 著

李芳齡 譯

## 人工智慧時代的科學思維 統計之美

李隆、海恩 著  
張慶暉 博士 審閱

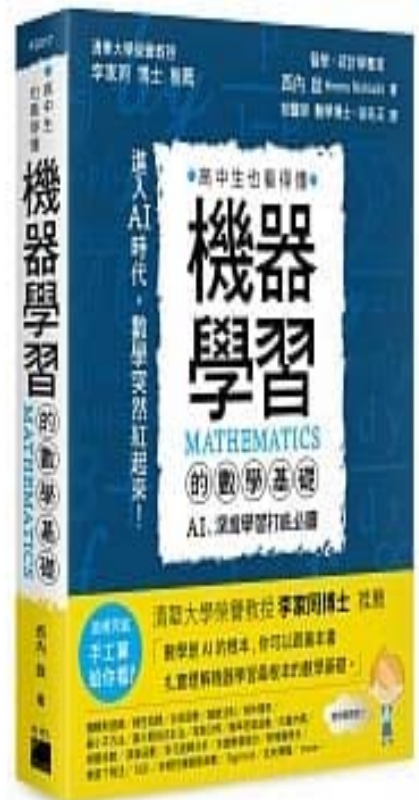
統計之美

李隆、海恩 著  
張慶暉 博士 審閱

深智  
CM1916



96個生活故事講懂人工智慧科學思維  
一條條瑣瑣雜雜建立人工智慧統計基礎  
有趣、有味、有智慧、如飲醇酒、如沐春風





創新

翟本喬透視問題、勇於突破的  
思考模式和勝出策略

當人人都在倡導創新  
唯有他一針見血點出原地踏步的真正緣由  
具體指出解決問題的關鍵方法  
Google + 貝爾實驗室 (Bell Labs) 頂尖工程師  
身兼數職的傑出領導者  
完整公開其打破常規、另立典範的創新思維與技術

是一種

*Innovative Attitude:  
Breaking the Frames around your Mind*

態度

翟本喬 著

## ASSURANCE OF LEARNING

### PhD

Learning Goal and Objective
Goal 1: Creative Thinking  Objectives: 1. Understanding the basic management concept 2. Thinking creative and critical business solutions  Learning Trait: Trait 1 Understand essential management concepts Trait 2 Variety of ideas Trait 3 Think critically Trait 4 Think creatively

為配合教育部針對保護智慧財產權觀念之宣導，課程大綱內容請加註警語「請尊重智慧財產權，不得非法影印教師指定之教科書籍」。