System Identification and Adaptive Control

(SDM5006)

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Aim of Course

To develop the following skills:

- ✓ Understand system identification and adaptive control methods
- ✓ Identify parameters and estimate states of dynamical systems
- ✓ Design adaptive controllers of dynamical systems
- ✓ Solve control engineering problems

Course Contents

Part 1: System Identification

1. Basic Concepts of System Identification
2. Various Least Squares Methods
3. System Identification Methods

Part II: Adaptive Control

4. Introduction to Adaptive Control
5. Model Reference Adaptive Control
6. Self-Tuning Control

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Reference Books

① Lennart Ljung, **System Identification Theory for the User** (2nd Edition), Prentice-Hall, Inc. 1999.

② Karl Johan Astrom and Bjorn Wittenmark, **Adaptive Control** (2nd Edition), Dover Publications, Inc. Mineola, New York, 2008.

③ 庞中华，崔红，**系统辨识与自适应控制MATLAB仿真**(第3版)，北京航空航天大学出版社，2017.

④ 柴天佑，岳恒，**自适应控制**，清华大学出版社，2016.

⑤ 杨承志，孙棣华，张长胜，**系统辨识与自适应控制**,重庆大学出版社，2003.

⑥ 刘金琨，沈晓蓉，赵龙，**系统辨识理论及MATLAB仿真**，电子工业出版社，2013.

⑦ Guo-Ping Liu, **Nonlinear Identification and Control: A Neural Network Approach**, Springer-Verlag Ltd., 2001.

⑧ Hong Wang, Guo-Ping Liu, Chris J. Harris and Martin Brown, **Advanced Adaptive Control**, Pergamon Press Ltd., Oxford, 1995.

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Contacts

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Assessment

1. Attendance **(5%)**
2. Assignments **(25%)**
3. Projects **(30%)**
4. Final exam **(40%)**

Note: If undergraduate students take this course, they only need to complete **80%** of each assessment part.