Instrument and Control Engineering

2 units (selection)

Masafumi Miwa · Associate Professor / Intelligent Machines, Mechanical Engineering, Intelligent Structures and Mechanics Systems Engineering

Target〉 This class introduces the research results using control strategies, the application to the industrial plant of control technology.

Outline〉 Computer application to factory automation, control of industrial robot, digital process control, dynamic modeling of industrial chemical plant with neural network, dynamics of pneumatic actuators, two degree of freedom control and control of pneumatic actuators using intelligence strategies are lectured.

Style〉 Lecture

Keyword〉 ***dynamic modeling, intelligent control***

Relational Lecture〉 "**Mechanical Systems Design**"(0.5), "**Design of Dynamic Systems**"(0.5)

Requirement〉 Students are required to have a good understanding of graduate-level control engineering and related subjects.

Goal〉 To understand the application to industrial plant of digital control theory,the intelligent control using actuators.

Schedule〉

1. Outline of digital control theory
2. Outline of two-degree-of-freedom control method
3. Design of two-degree-of-freedom control system
4. Model predictive control
5. Application to chemical plant control of model predictive control
6. Auto tuning PID control of chemical plant(1)
7. Auto tuning PID control of chemical plant(2)
8. Application of generalized predictive control
9. The structure and function of actuators
10. Digital control and servo mechanism
11. Recent topics of intelligent control
12. Outline of neural network
13. Neural network compensator
14. Intelligent control using actuators
15. Application to plant of control theory(1)
16. Application to plant of control theory(2)

Evaluation Criteria〉 Assignments count 100 %

Textbook〉 Printed synopses are used.

Reference〉 To be introduced in the class.

Contents〉 http://cms.db.tokushima-u.ac.jp/cgi-bin/toURL?EID=216631

Contact〉

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