

Introduction to Intelligent Systems

Course number: 430.457
Time: M/W 11:00-12:15PM
Location: Building 301 Room 302

Instructor: Prof. Songhwai Oh (오성회)
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Course description: This course introduces the foundations of intelligent systems, such as probabilistic modeling and inference, statistical machine learning, computer vision, and robotics, to undergraduate students. Topics include Bayesian networks, hidden Markov models, Kalman filters, Markov decision processes, linear regression, linear classification, and nonparametric models. Students will also learn about how these methods are applied to practical applications such as computer vision and robotics. Lectures will be in English.

Textbooks: Stuart Russell and Peter Norvig. Artificial Intelligence: A Modern Approach (3rd edition), Prentice Hall, 2009.

Grading: Assignments (40%), midterm (20%), and final (40%). Note that the percentages are approximate and the actual weights used to compute the final grades may be different.

Prerequisites: Introduction to random variables and random processes (430.314, 확률변수 및 확률과정의 기초) and linear algebra for electrical systems (430.216, 전기시스템 선형대수).

Academic honesty: Same as the academic integrity policy of the university and the school.

Weekly plan (subject to change):

Week 1	Review of probability and linear algebra
Week 2	Probabilistic Modeling and Inference:
Week 3	Bayesian networks, Hidden Markov models, Kalman filters
Week 4	Markov decision processes
Week 5	Machine Learning:
Week 6	Linear classification, Linear regression, Learning with complete data
Week 7	Learning with hidden variables, EM algorithm
Week 8	Nonparametric models, Support vector machines
Week 9	Reinforcement learning
Week 10	Computer Vision:
Week 11	Image formation, Edge detection, Texture, Optical flow, Image segmentation
Week 12	Object recognition, Reconstructing the 3D world
Week 13	Robotics:
Week 14	Localization and mapping, Motion planning, Planning uncertain movements, Moving
Week 15	Robotic software architectures, Application domain