CMPT 419 - D200 Spec.Topics/Artificial Intell.

Instructor(s): Mo Chen  
SFU Burnaby

Calendar Objective/Description:  
Spec.Topics/Artificial Intell.

Instructor's Objectives:  
This course introduces fundamental concepts in robotics and related fields, including analytical methods for decision making, and machine learning in the context of robotics. Topics include modelling and simulation of robotic systems, optimization, optimal control, robotic safety, reinforcement learning, and robotic perception. Applications of the material include unmanned aerial vehicles and self-driving cars.

Prerequisites:  
see go.sfu.ca

Topics:  
- Modelling and simulation  
- Optimization  
- Optimal control  
- Robotic safety  
- Reinforcement learning  
- Robotic perception

Grading:  
Assignments – 40%  
Project proposal – 10%  
Project presentation and report – 50%

Recommended Books:  
Introduction to Autonomous Mobile Robots, R. Siegwart, I. R. Nourbakhsh, and D. Scaramuzza, MIT Press, 9780262015356  
Planning Algorithms, S. M. LaValle, Cambridge University Press, 9780521862059  
Convex Optimization, S. Boyd and L. Vandenberghe, Cambridge, 9780521833783  
Dynamic Programming and Optimal Control, D. P. Bertsekas, Athena Scientific, 9781886529434  
Reinforcement Learning: An Introduction, R. S. Sutton and A. G. Barto, MIT, 9780262039246

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