

# MDP学习计划

## MDP理论部分

### 1. 核心书籍: Markov Decision Processes Discrete Stochastic Dynamic Programming

- 这本书的符号定义完整，并且和现在的论文所使用的符号比较接近，或者说比较被学术界接受。
- 这本书涉及的内容比较广泛：Finite-Horizon MDP, Infinite-Horizon MDP, Discounted MDP，Continuous-Time Models等，基本涵盖了所有MDP的概念。
- 根据目录，我大概列了一个阅读计划表。

Chapter No.	Chapter Title	Deadline
Ch02	Model Formulation	2019.07.26
Ch04	Finite-Horizon Markov Decision Processes	2019.08.02
Ch05	Infinite-Horizon Models: Foundations	2019.08.09
Ch06	Discounted Markov Decision Problems	2019.08.16
Ch07	The Expected Total-Reward Criterion	2019.08.23
Ch08	Average Reward and Related Criteria	2019.08.30
Ch09	The Average Reward Criterion-Multichain and Communicating Models	2019.09.06
Ch10	Sensitive Discount Optimality	2019.09.13
Ch11	Continuous-Time Models	2019.09.20

### 2. 辅助书籍1：Introduction to Stochastic Dynamic Programming

- 这本书只有161页，阅读成本比较低。
- 这本小册子包含了几乎所有它所用定理的证明，降低了阅读障碍。

Chapter No.	Chapter Title	Deadline
Sec02	Discounted Dynamic Programming	2019.08.16
Sec03	Minimizing Costs–Negative Dynamic Programming	2019.08.23
Sec04	Maximizing Rewards–Positive Dynamic Programming	2019.08.30
Sec05	Average Reward Criterion	2019.09.06
Sec06	Stochastic Scheduling	2019.09.13
Sec07	Bandit Process	2019.09.20

### 3. 辅助书籍2：Finite Markov Chains

- 这本书涉及的几种马尔科夫链在TD算法证明中被拿过来作为假设，例如：  
Absorbing MC, Regular MC。
- 计划挑了几章来读，其他章节可能研究了MC状态转移矩阵的性质。

Chapter No.	Chapter Title	Deadline
Ch03	Absorbing Markov Chains	2019.08.02
Ch04	Regular Markov Chains	2019.08.09
Ch05	Ergodic Markov Chains	2019.08.16

## Robust MDP

目前只找了几份论文资料。

- 论文：Action Robust Reinforcement Learning and Application in Continuous Control
- 论文：Robust Dynamic Programming
- 论文：Robust Markov Decision Process
- 书籍章节：Robust Optimization 的第十三章 Robust Markov Decision Process
- 博弈论Game Theory中的Markov Game可能和RMDP有关。