

Paper Review Guidelines

Kyuree AHN

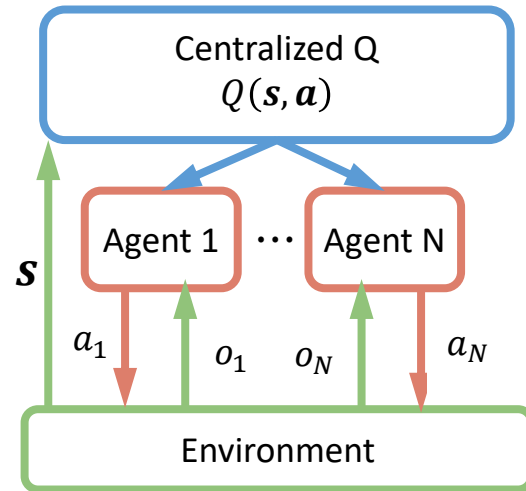
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Paper Presentation Guideline

- 15 min Presentation + 5 min Q&A
- 2 students / 1 paper
- December 2 (Mon) : 4 papers (learning cooperation)
- December 9 (Mon) : 5 papers (learning communication)
- December 11 (Wed) : 4 papers (MARL in non-cooperative setting)
- Things to include in your presentation:
 - Motivating question, **previous model (if exists)**
 - Complete explanation of key concepts/main idea
 - Critique/ limitations of the paper

December 2: 10:30~12:00

Learning Cooperation



$$\pi(s, a_1, \dots, a_N) \approx \prod_{i=1}^N \pi_{\theta_i}(o_i, a_i)$$

- A centralizer computes centralized value function based on joint information, (s, \mathbf{a})
- Consensus through **central Q** modeling
- Centralized training, decentralized execution (CTDE)

[3] Foerster, Jakob N., et al. "Counterfactual multi-agent policy gradients." AAAI, 2018

[4] Iqbal, Shariq, and Fei Sha. "Actor-attention-critic for multi-agent reinforcement learning." ICML, 2018

Learning Cooperation by Value function factorization

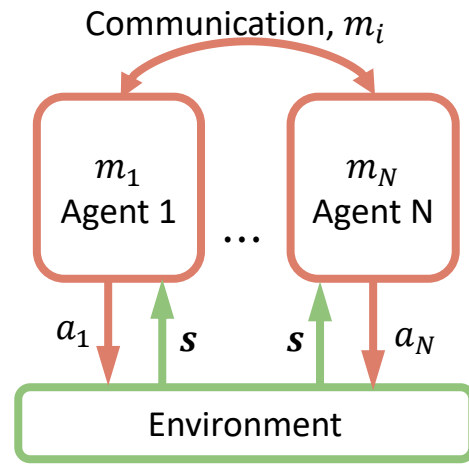
[1] Rashid, Tabish, et al. "QMIX: monotonic value function factorization for deep multi-agent reinforcement learning." ICML, 2018

[2] Son, Kyunghwan, et al. "QTRAN: Learning to Factorize with Transformation for Cooperative Multi-Agent Reinforcement Learning." ICML, 2019

Q. How these papers model centralized value function?

December 9: 10:30~12:00

Learning Communication



$$\pi(s, a_1, \dots, a_N) \approx \prod_{i=1}^N \pi_{\theta_i}(\mathbf{m}_i, \bar{\mathbf{m}}_i, a_i)$$

- Each agent learns communication message, \mathbf{m}_i
- Each agent receives other agents' message, $\bar{\mathbf{m}}_i$
- Consensus through **communication**

- [5] Sukhbaatar, Sainbayar, and Rob Fergus. "Learning multiagent communication with backpropagation." NeurIPS, 2016
- [6] Jiang, Jiechuan, and Zongqing Lu. "Learning attentional communication for multi-agent cooperation." NeurIPS, 2018
- [7] Kim, Daewoo, et al. "Learning to schedule communication in multi-agent reinforcement learning." ICLR, 2019
- [8] Singh, Amanpreet, Tushar Jain, and Sainbayar Sukhbaatar. "Learning when to communicate at scale in multiagent cooperative and competitive tasks." ICLR, 2018
- [9] Das, Abhishek, et al. "Tarmac: Targeted multi-agent communication.", 2018

Q. How these papers model communication between agents?

December 11: 10:30~12:00

Non-cooperative game setting

- [10] Lowe, Ryan, et al. "Multi-agent actor-critic for mixed cooperative-competitive environments." NeurIPS, 2017
- [11] Li, Shihui, et al. "Robust multi-agent reinforcement learning via minimax deep deterministic policy gradient." AAI, 2019.
- [12] Yang, Yaodong, et al. "Mean field multi-agent reinforcement learning." ICML, 2018
- [13] Bansal, Trapit, et al. "Emergent complexity via multi-agent competition." ICLR, 2018

Q. How these papers model opponents' behavior?

Grading

- Peer evaluation (average peer score)

(5pt) Contents: does the presentation includes the complete explanation of the key concept?

(5pt) Clarity: does the presentation clear and logically organized?

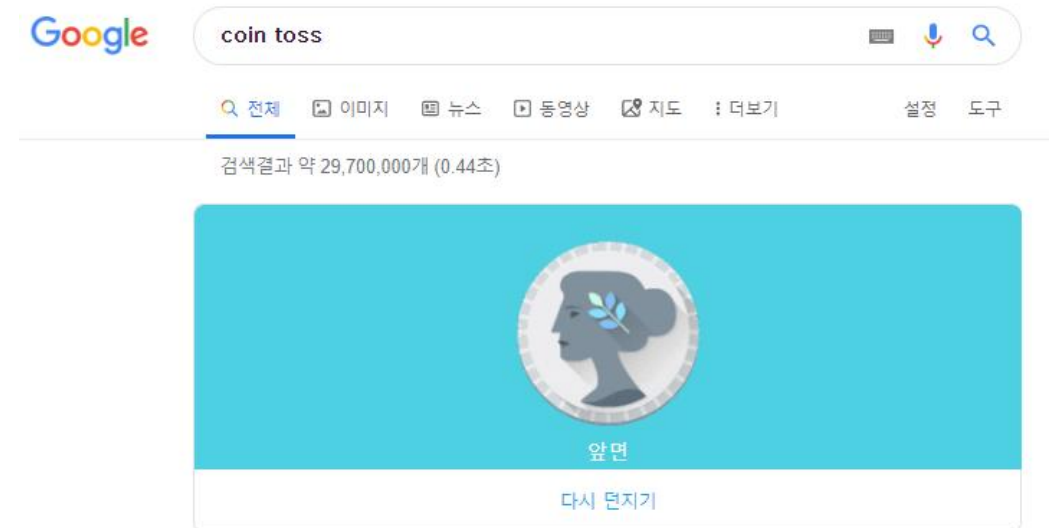
(5pt) Critique: does the presenter reason out the strength and weakness of the paper ?

Paper Presentation team

Paper No.

1	강상민	신용진	
2	Yajie zhou	Kasime te	
3	김석중	김태영	
4	서정현	성현기	
5	신동혁	장성욱	
6	유지환	배지석	
7	장성연	윤세은	
8	이민재	김태형	
9	조혜민	최규진	
10	Vcchietti	GiGIH Setyantho	
11	배상민	허재석	
12	윤진원	박진우	
13	김두연	김형욱	Norman Doret

We will selection the presenter with coin-toss



If you cannot find your teammate, contact me! (ahnkjuree@kaist.ac.kr)