

ACTION SEMANTICS NETWORK: CONSIDERING THE EFFECTS OF ACTIONS IN MULTIAGENT SYSTEMS

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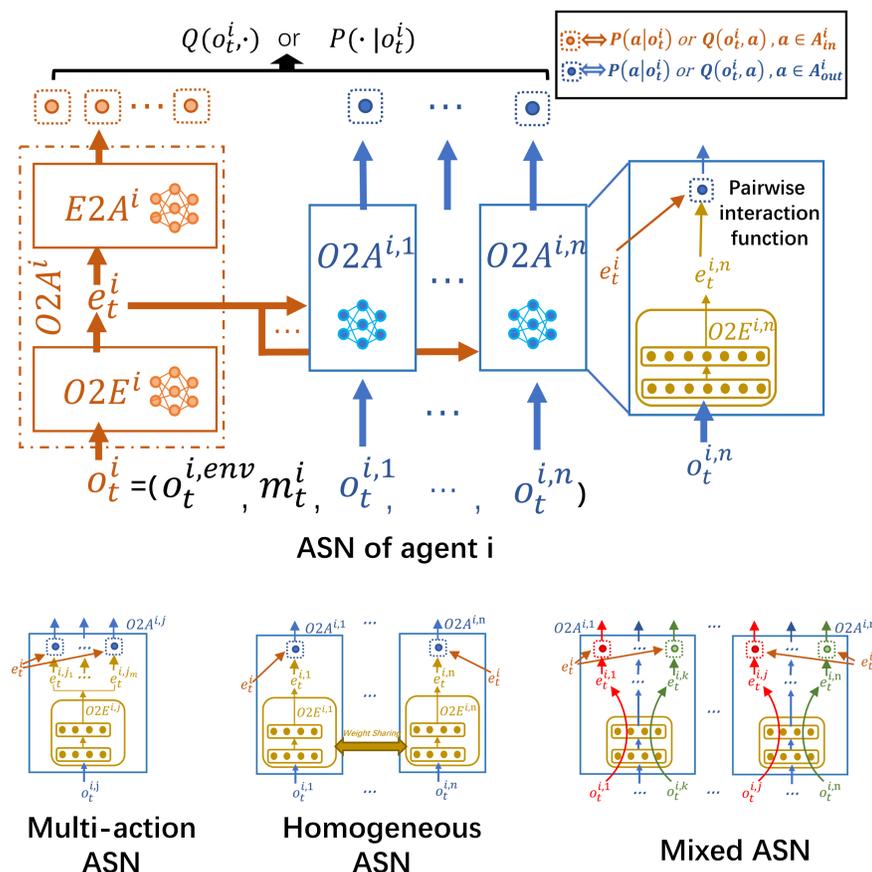


Motivation

In MASs, multiple agents interact with the environment simultaneously which increases the environmental stochasticity and uncertainties, making it difficult to learn a consistent globally optimal policy for each agent. A number of Deep Multiagent Reinforcement Learning approaches have been proposed to address such complex problems in MASs by either incorporating various multiagent coordi-

nation mechanisms into deep multiagent learning architecture or designing specialized network structures to facilitate multiagent learning. However, none of them explicitly consider extracting action semantics, which we believe is a critical factor that we can leverage to facilitate coordination in multiagent settings.

Action Semantics Network Architecture

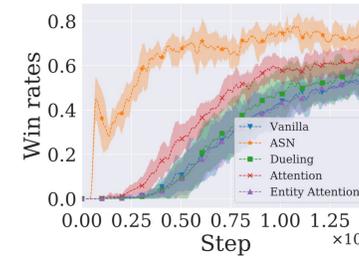
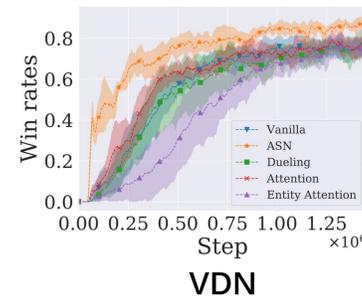


StarCraft II

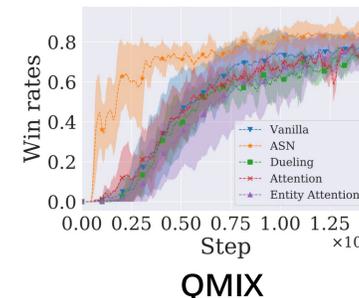
■ StarCraft II 8m map (8 Marines vs 8 Marines)



SC2-8m

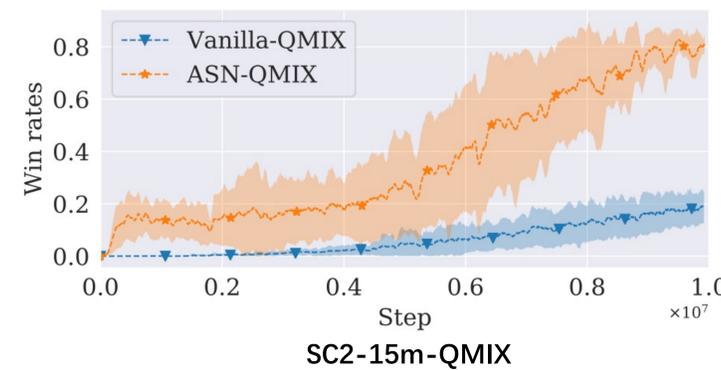


IQL



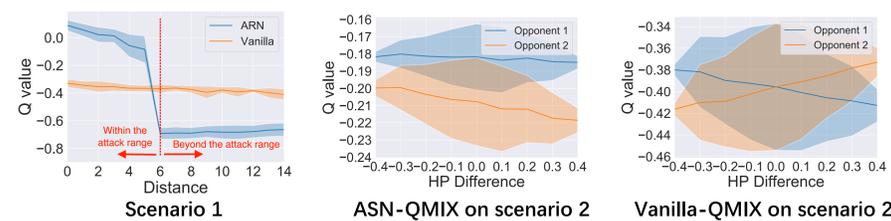
QMIX

■ Is ASN still effective on large-scale scenarios?



SC2-15m-QMIX

■ Can ASN effectively improve the estimation accuracy of actions?



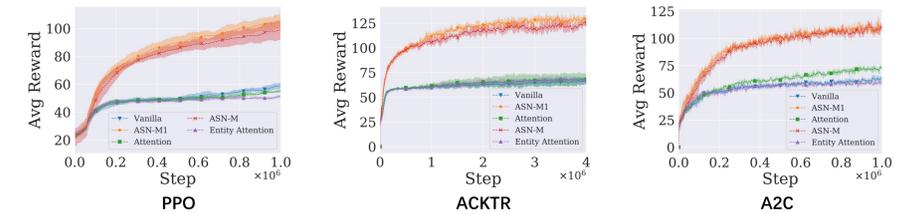
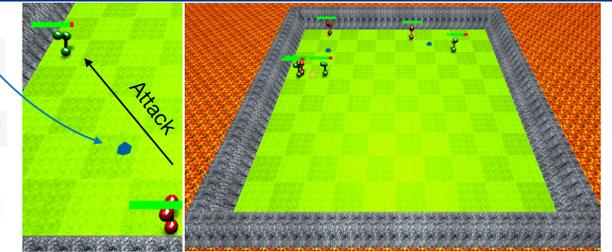
Neural MMO

Damage Range

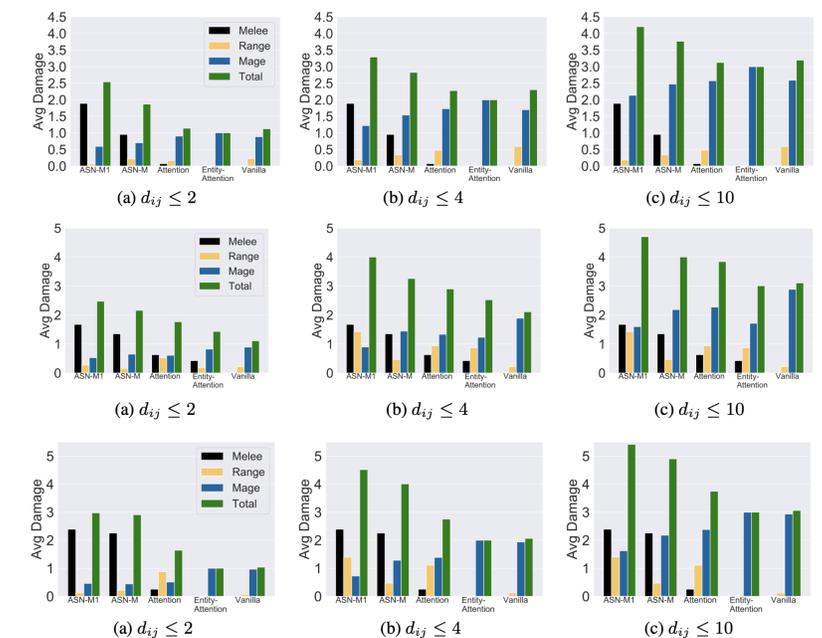
Mage 1 10

Range 2 4

Melee 5 2



■ Can ASN recognize the best actions from multiple ones?



More Details

