

Learning from Learners: Adapting Reinforcement Learning Agents to be Competitive in a Card Game

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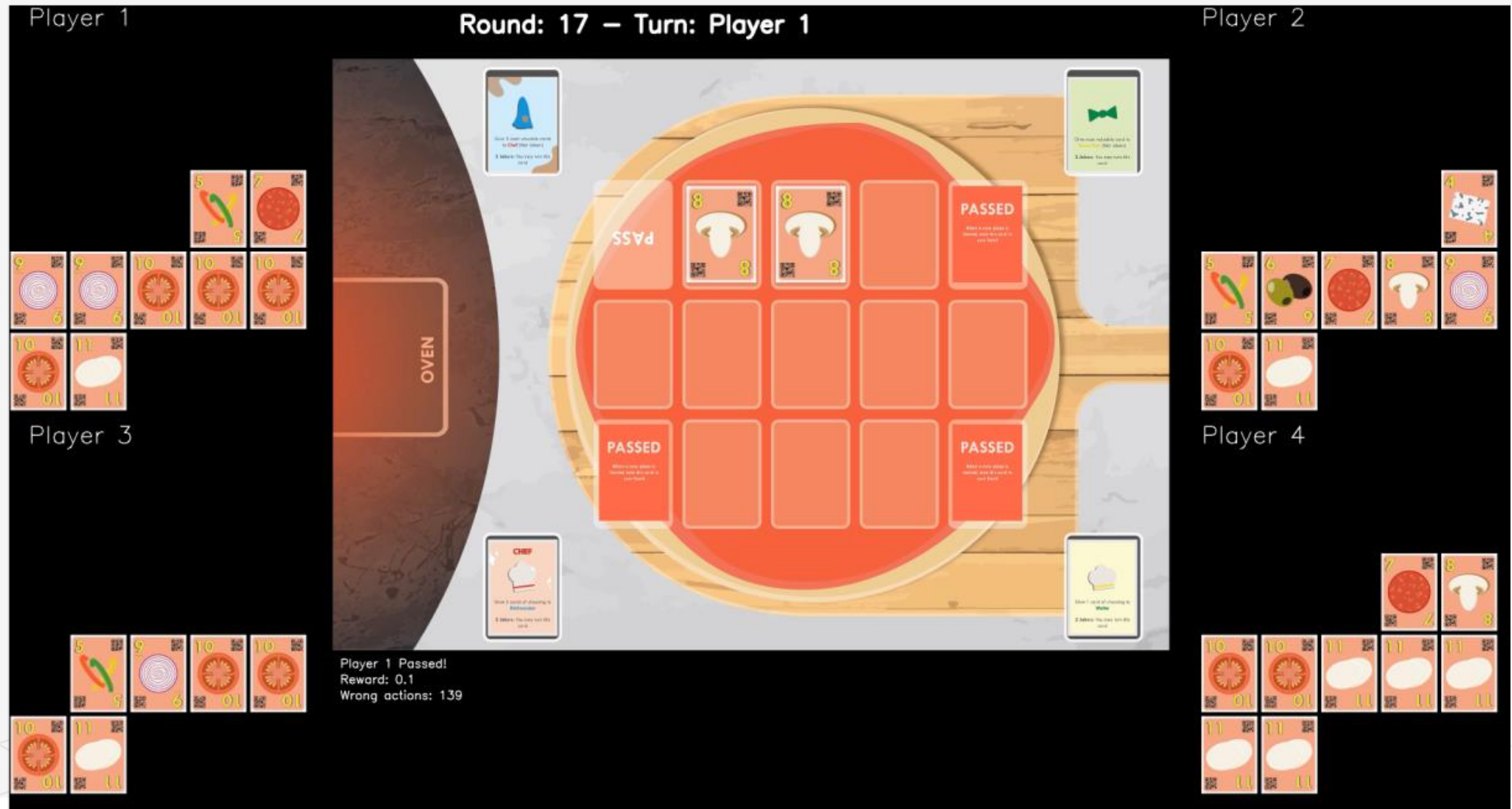
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The Chef's Hat Card Game

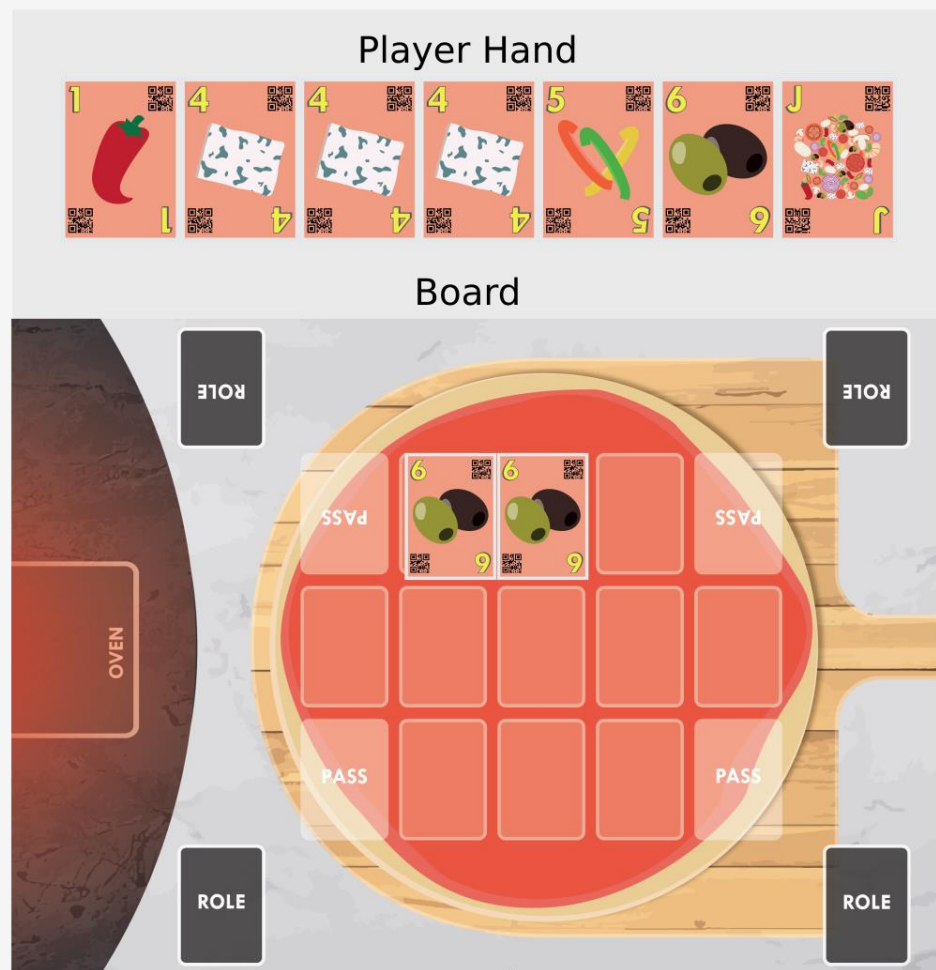


Card Game Simulation

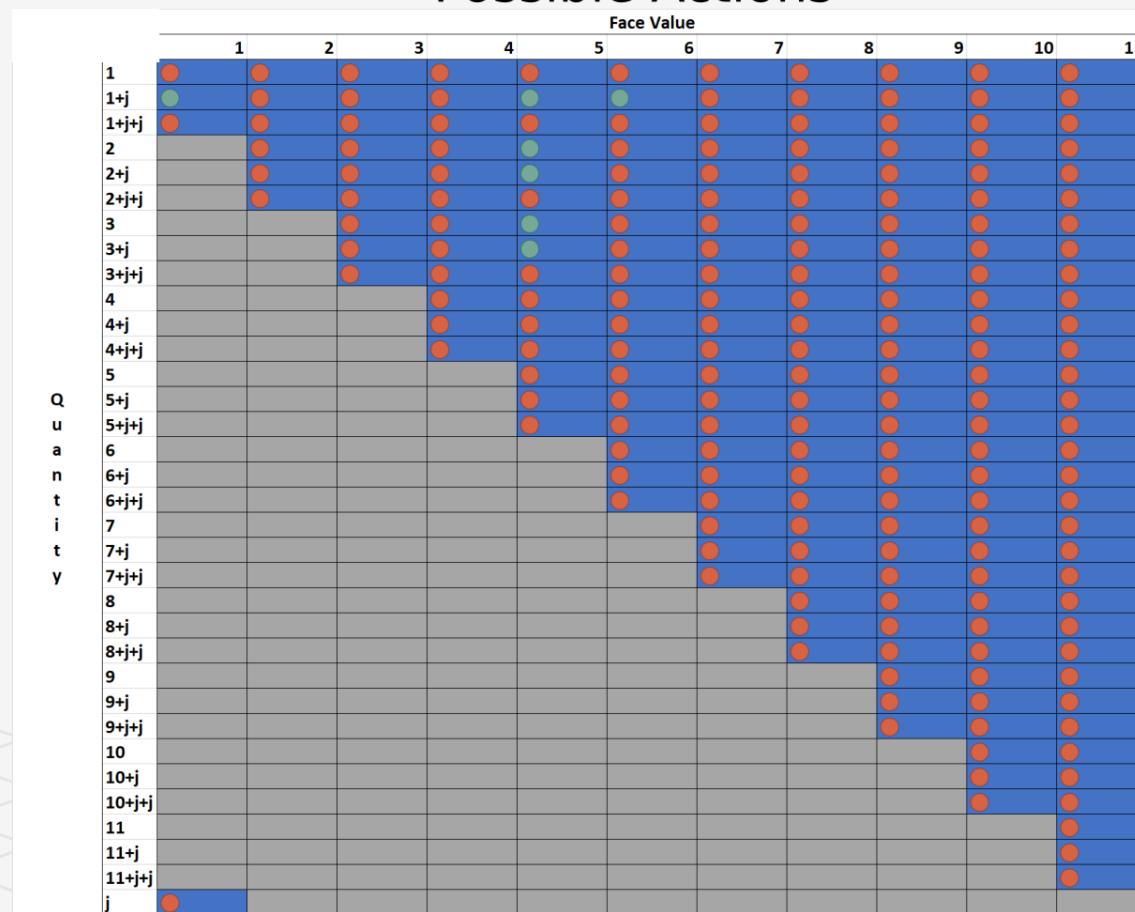


Learning to be the Chef

Game state

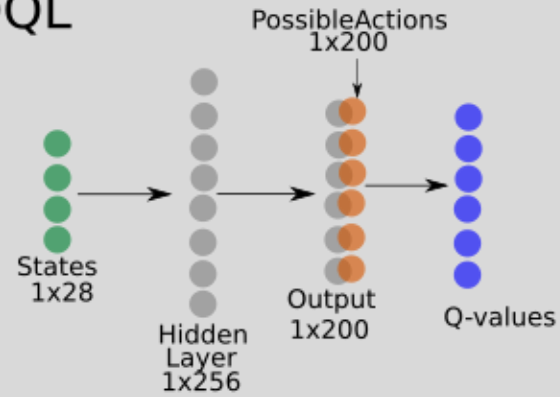


Possible' Actions



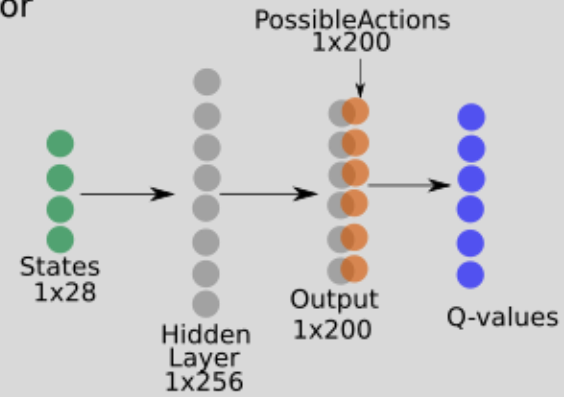
The Take of Three Learners

DQL

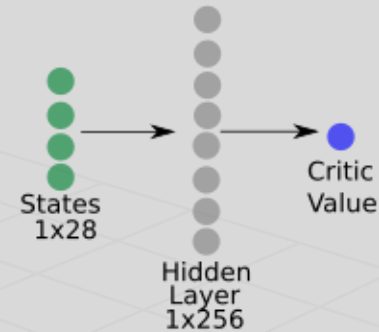


PPO

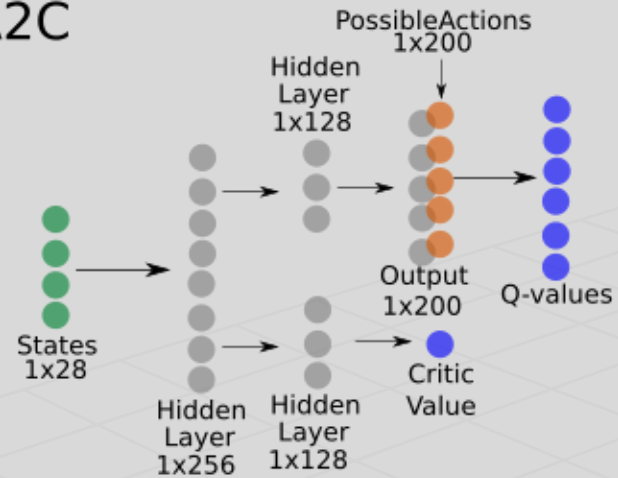
Actor



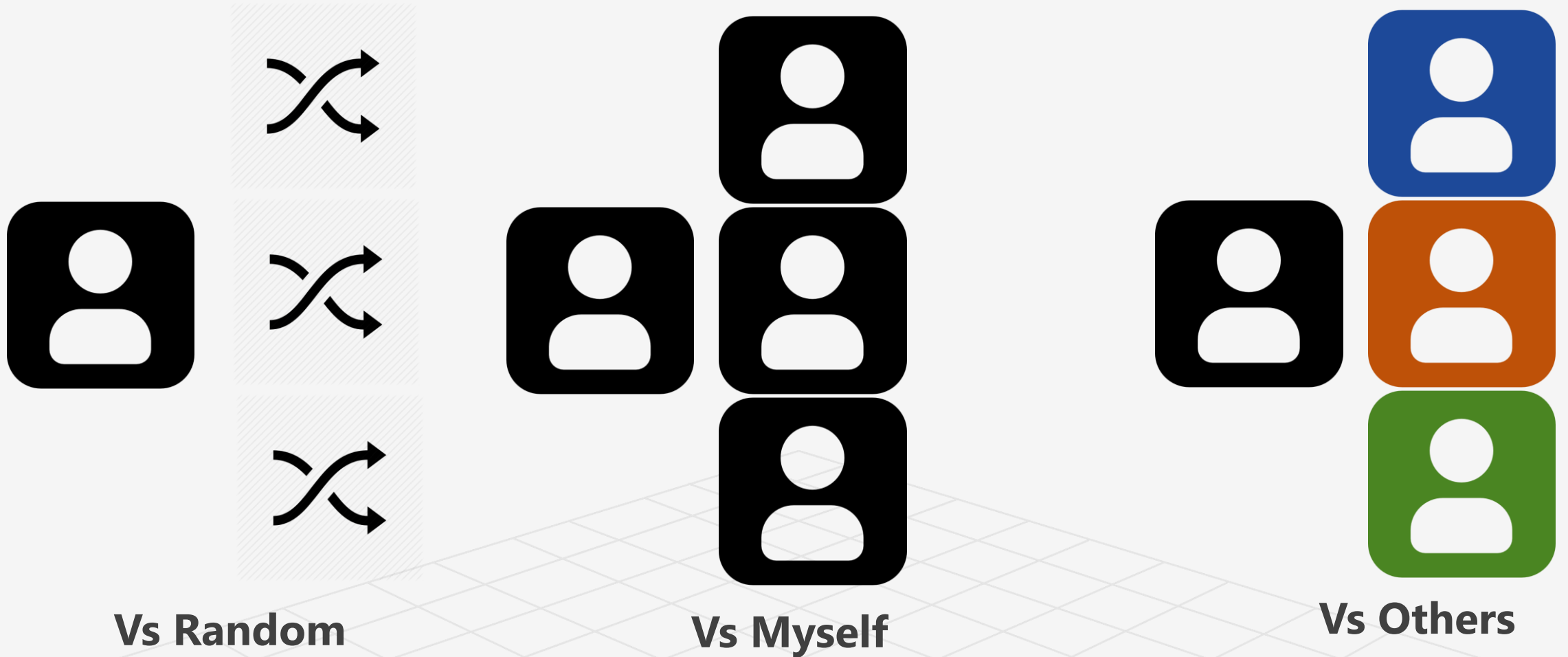
Critic



A2C



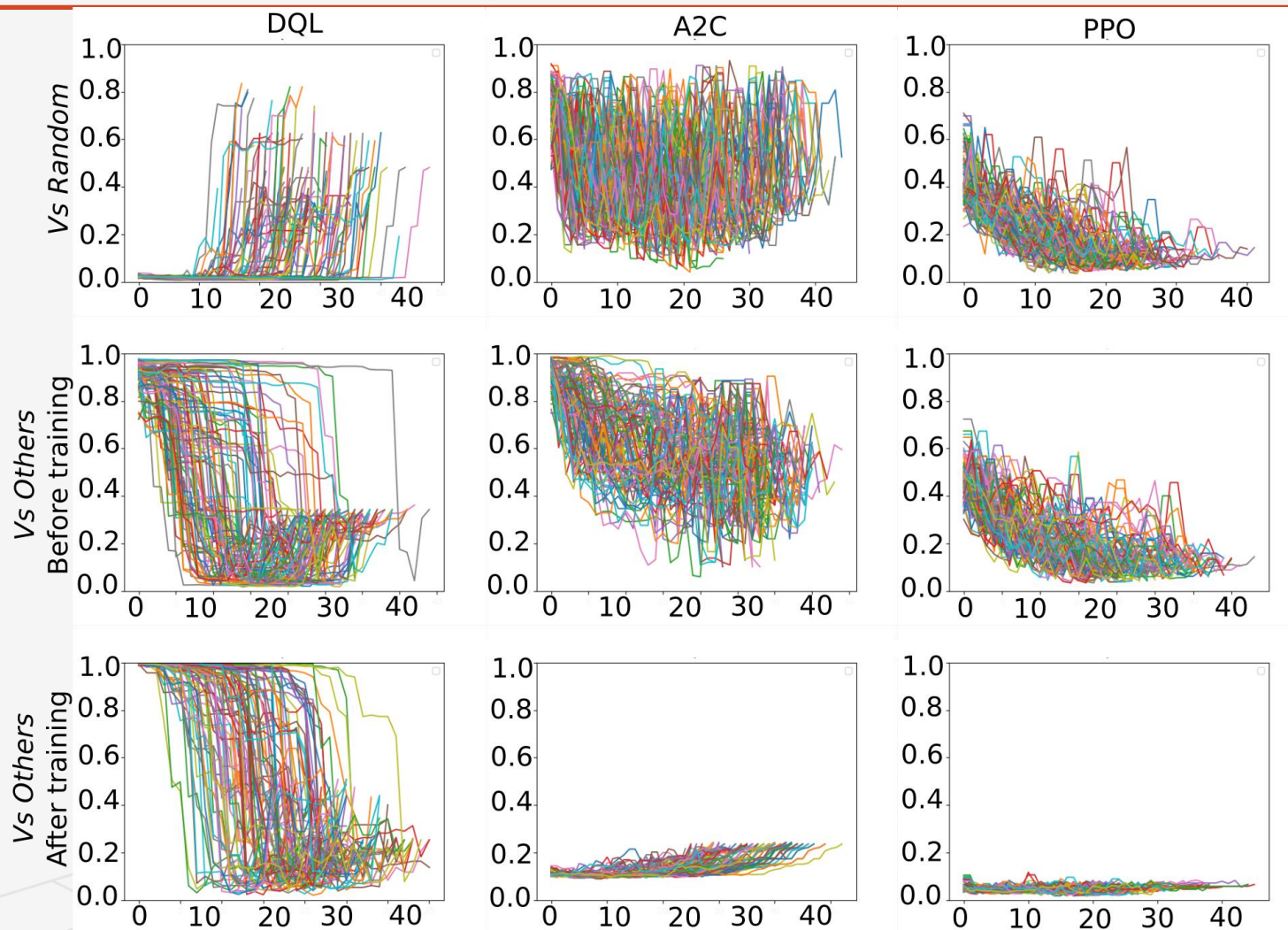
Evaluating Competition



How Competitive Am I

<i>vs. Random</i>				
Model	Victories	Random1	Random2	Random3
DQL	66.8 ± 5.69	9.7 ± 3.13	12.9 ± 4.66	10.6 ± 1.8
A2C	65.1 ± 5.19	9.3 ± 3.1	12.1 ± 4.35	13.5 ± 3.58
PPO	83.1 ± 4.18	4.7 ± 2.19	6.0 ± 2.28	6.2 ± 1.83
<i>vs. Myself</i>				
Model	Gen-1	Gen-25	Gen-50	Random
DQL	19.4 ± 4.78	24.8 ± 4.98	42.9 ± 7.06	12.9 ± 6.64
A2C	25.4 ± 4.39	29.1 ± 6.14	34.5 ± 7.12	11 ± 2.86
PPO	16.9 ± 3.36	32.5 ± 3.75	40.3 ± 3.52	10.3 ± 4.1
<i>vs. Others</i>				
Model	Before training		After training	
DQL	35.9 ± 3.11		35.9 ± 3.11	
A2C	18.9 ± 3.51		4.9 ± 2.84	
PPO	42.8 ± 5.06		48.5 ± 40.6	
Random	2.4 ± 0.8		3.3 ± 1.85	

What is to be Competitive?



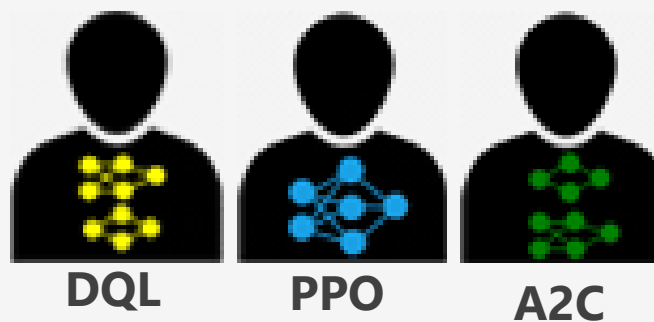
Conclusions

Chef's Hat



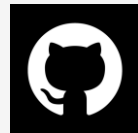
Simulation Environment

Learning Agents



Thank you!

Thank you all!



<https://github.com/pablovin/ChefsHatGYM>



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