



國立臺灣大學
National Taiwan University

Agent & Environment

CAE碩一 周遠同

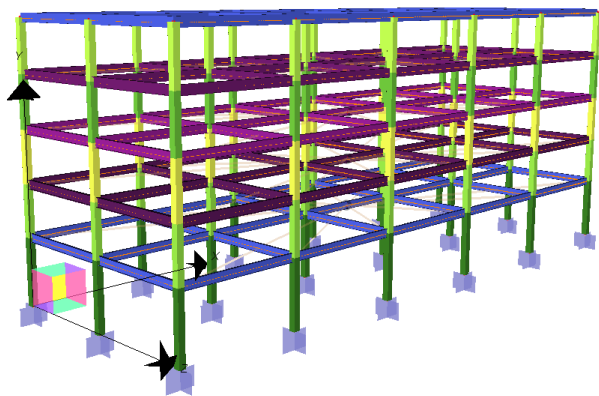
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Environment (StructureSimulator)

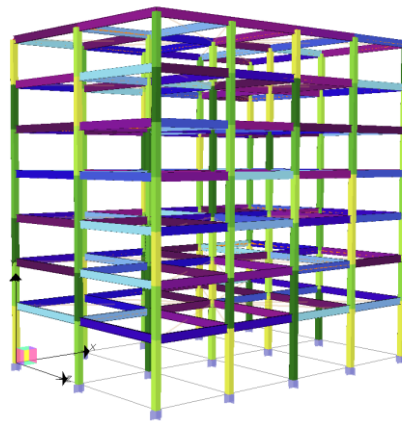
```
from Searching import Environment
env_args = {"simulator_path": XXX, "ground_motion_number": 5,
            "method": "MCTS"}
env = Environment.StructureSimulator(**env_args)
```

Agent (StructureDesigner)

```
from Agent import StructureDesigner  
agent_args = {"mode": "story", "environment": env}  
agent = Agent.StructureDesigner(**agent_args)
```



mode = "story"



mode = "element"

Agent

- state : [1F_col, 2F_col, ..., 1F_X_bm, 1F_Y_bm, 2F_X_bm, 2F_Y_bm...]
- state_index: [0, 1, ..., 6, 7, 8, 9, ...]

agent.initialize_state()

agent.get_state() → ['16x16x0.375', '16x16x0.375', ..., 'W21x44', 'W21x44']

agent.steps() → how many sections need to design

agent.get_state_index() → index which col/bm you are designing

agent.available_actions(state_index) → ['W21x93', 'W21x83', ..., 'W21x44']

agent.take_action(action) → state_index will + 1

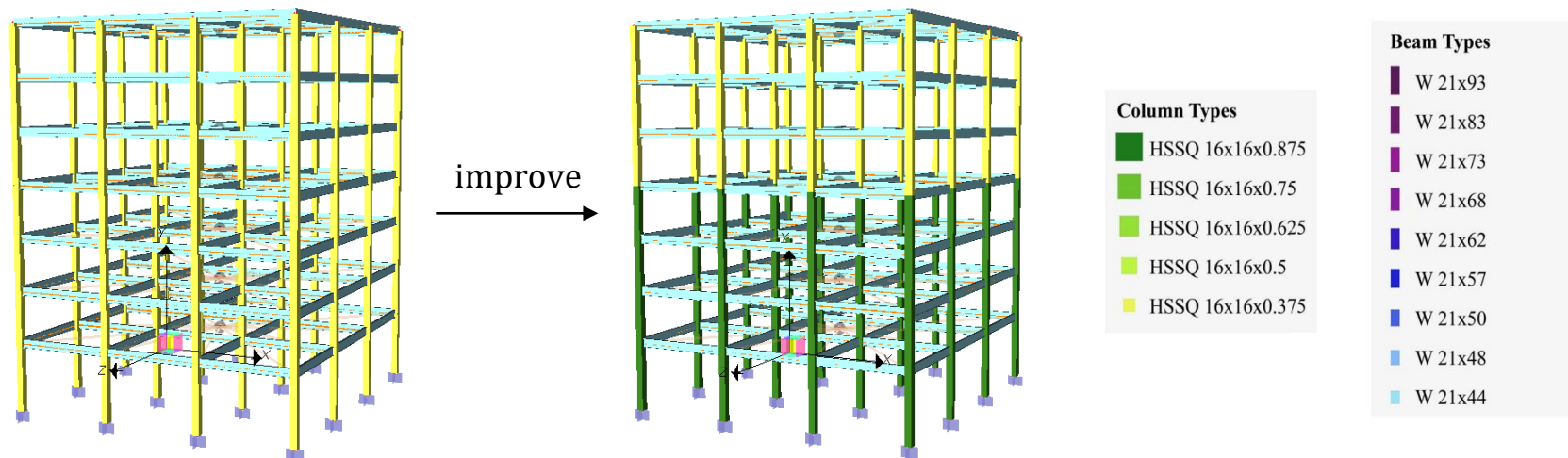
agent.is_final_state() → return if final state, if yes, don't take action more

agent.get_design() → return the section list for all element (if 'element' mode, then it will be same as agent.get_state(), but are different in 'story' mode)

Score of the design

`score = env . score(agent, agent.get_design())`

- Currently because the simulator model is still training, I modified the score to be only evaluated by material usage, and using more material will get higher score. You can use this simple mechanism to test your RL model first. Sorry ☹



Output final design & response

if agent.is_final_state():

 agent.output_design() → In Files/Output/Method/Time/design.ipt

 or

 final_design = agent.get_design()

 agent.output_design(final_design)

agent.visualize_response() → In Files/Output/Method/Time/Response/

 or

agent.visualize_response(final_design)



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Thanks for listening!