

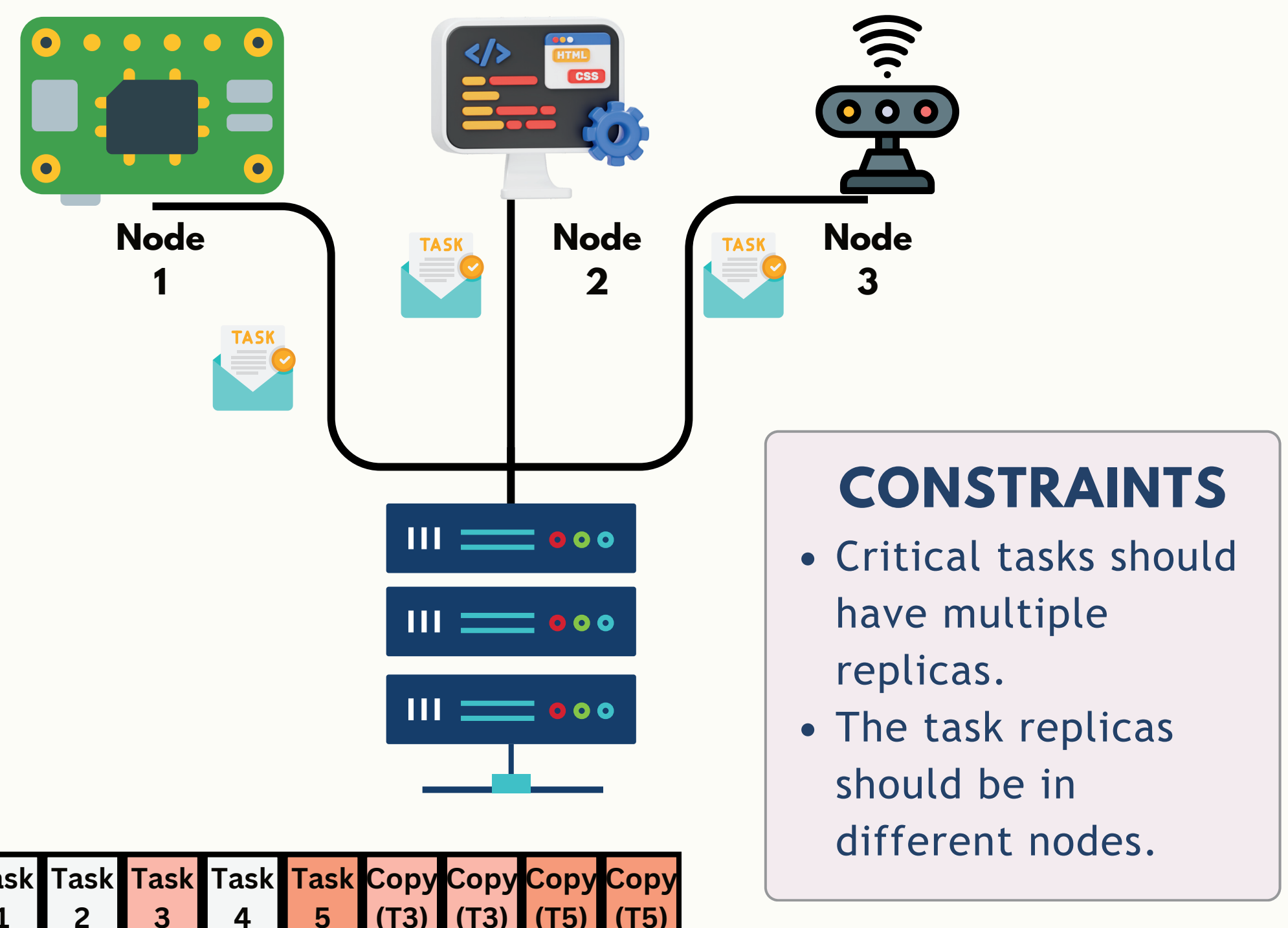
# NEW CONFIGURATIONS IN CRITICAL ADAPTIVE DISTRIBUTED EMBEDDED SYSTEMS

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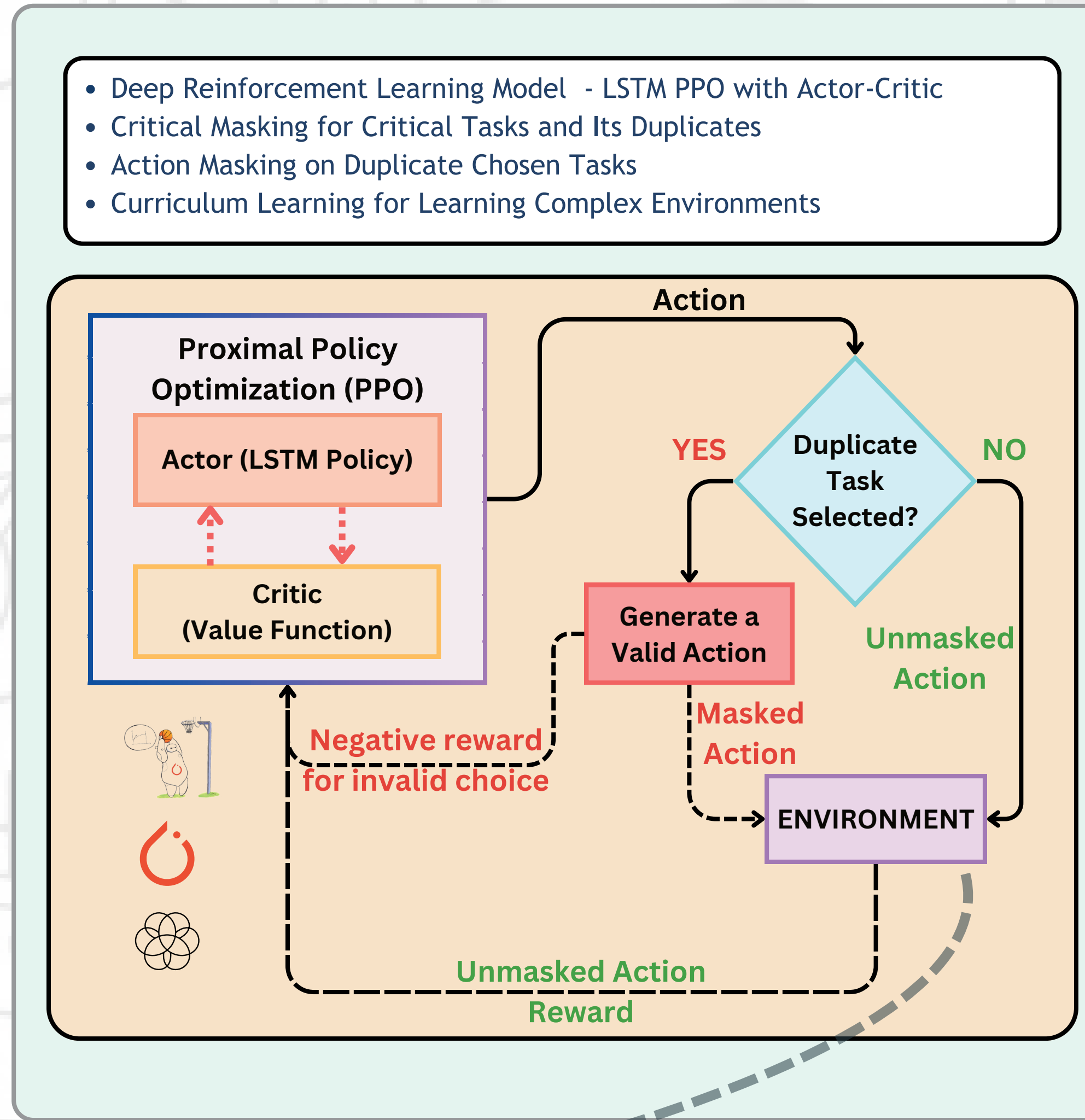


## WHAT IS IT?

A Distributed Embedded System (DES) is a network of nodes performing cooperative tasks. They may need high adaptability and should be able to handle dynamic and uncertain conditions. Our goal is to create a system that can find suitable configurations for tasks execution, support the allocation of critical tasks, and enable the replication of critical tasks so that the system can continue functioning in case of node failures.



## Flow



## Curriculum Learning

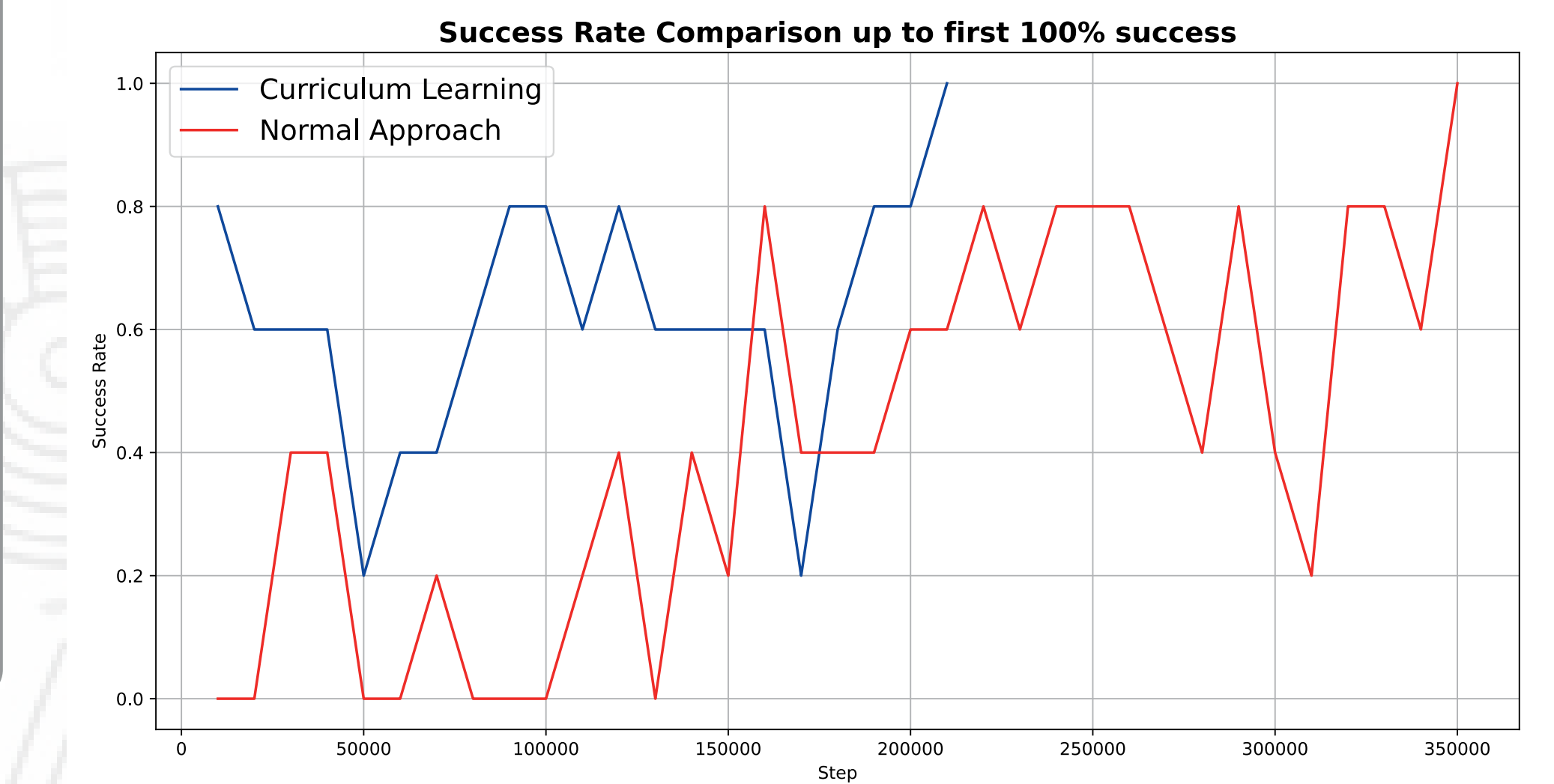
**Training:**

- Fixed Task Weights
- Small Range of variability
- On a higher range of variability

**Comparison:**

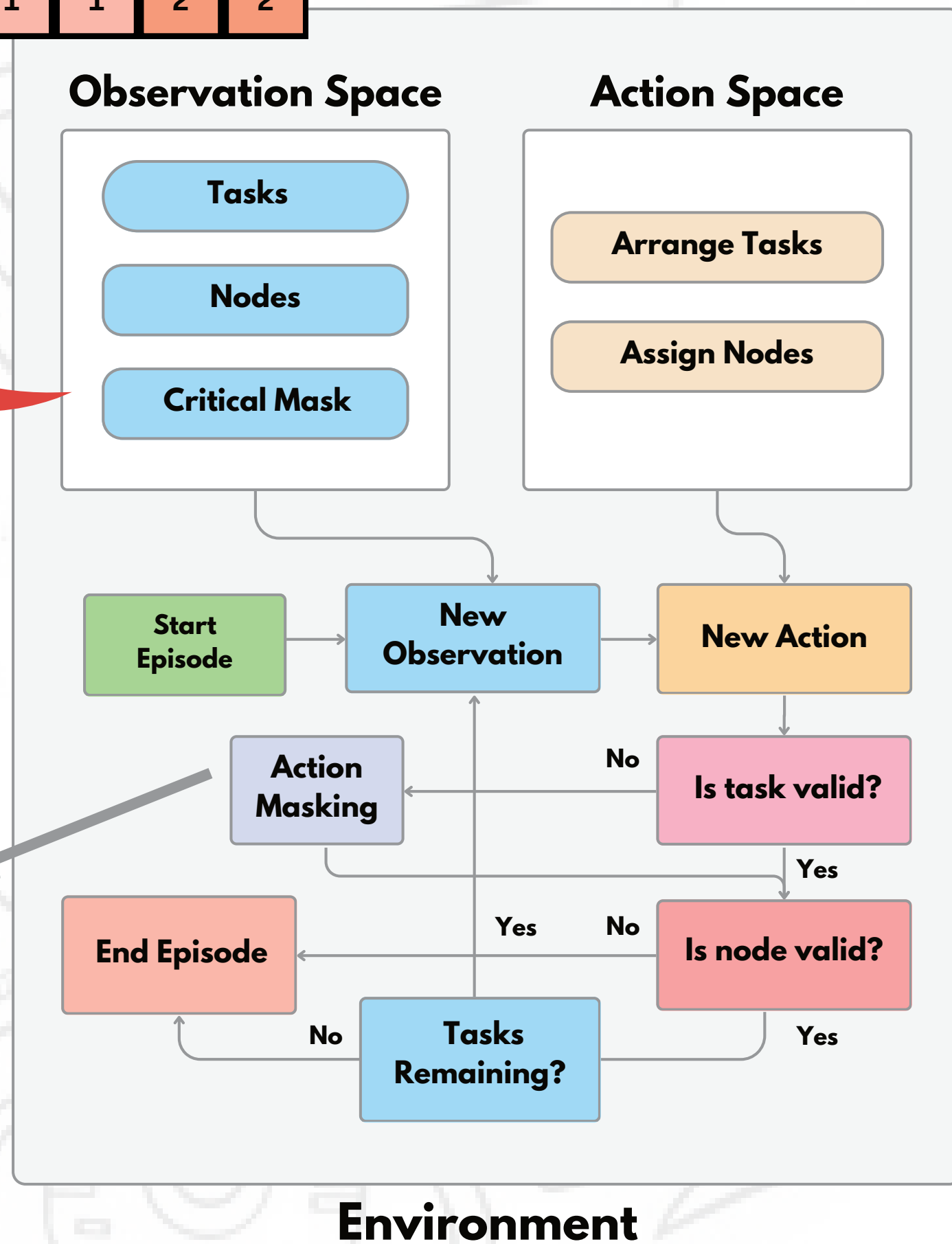
- Train Directly on the higher range

# of Tasks	Critical Tasks	Weight
12	2	3
12	2	3-4
12	2	1-5

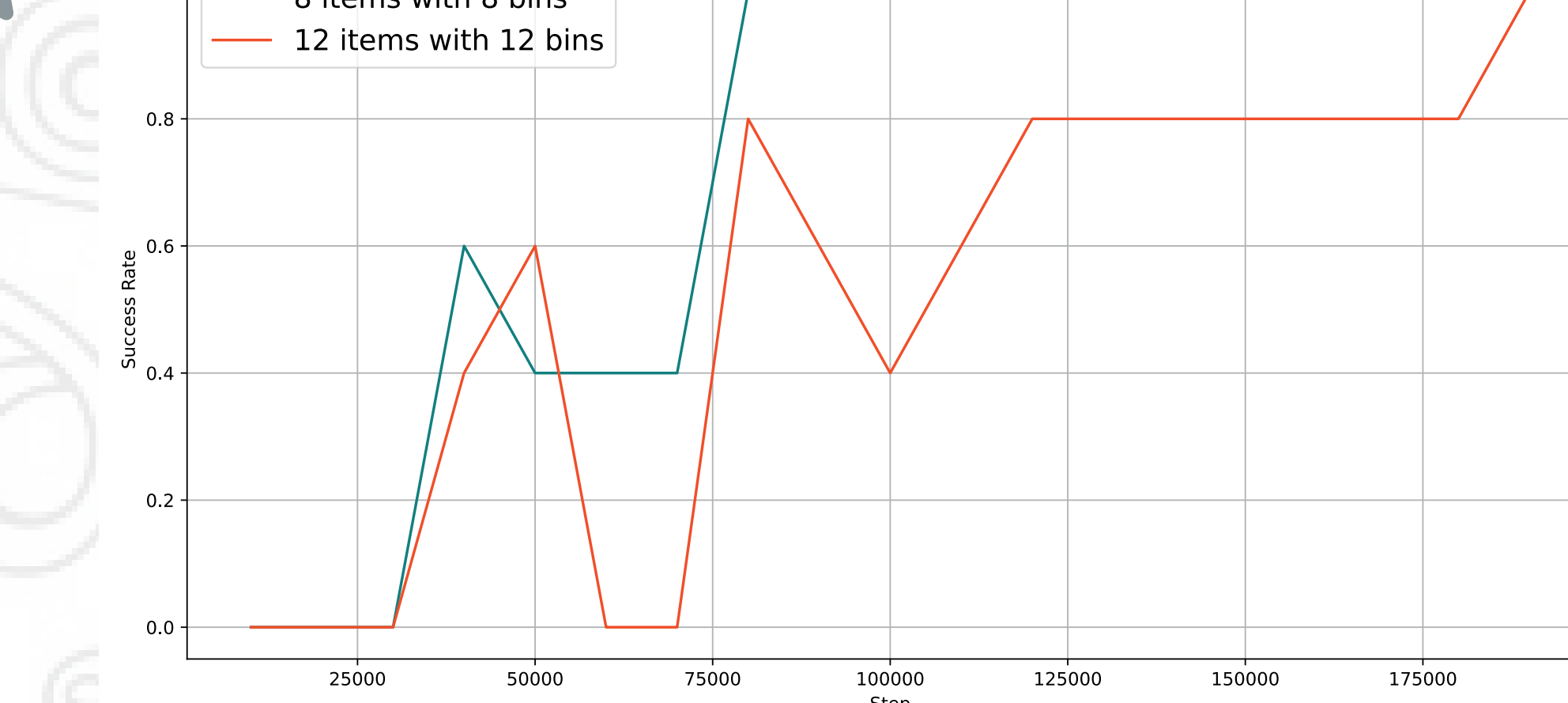


**WHY ACTION MASKING?**

- $O(N^N)$  complexity without Duplicate Masking
- $O(N!)$  Complexity with Duplicate Masking



## Success Rate Comparison up to first 100% success



## Applications

- Real-world applications and some of them have real-time (RT) and dependability requirements.
- In Distributed Clouds where zone-wise availability is crucial.
- From IOT, Sensor Fusion to Critical Industrial Systems