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Deep Reinforcement Learning-based Task Offloading and Resource Allocation for Industrial IoT in MEC Federation System

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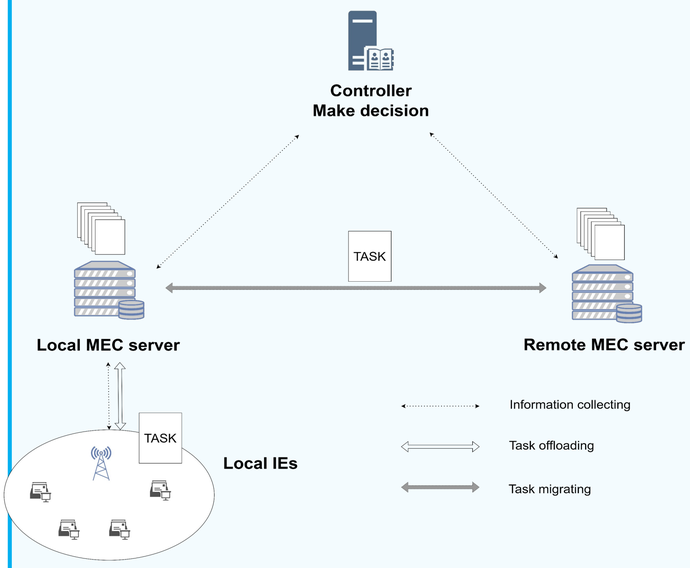
Introduction

- Propose a task offloading and resource allocation framework for IIoT system with MEC federation
- Formulate an optimization problem for both energy consumption and latency of our system model.
- Propose the DDPG-PER-based-RA algorithm to solve the optimization problem.
- Conduct the simulation to evaluate the performance of our proposed.

Proposed system model & Problem Formulation

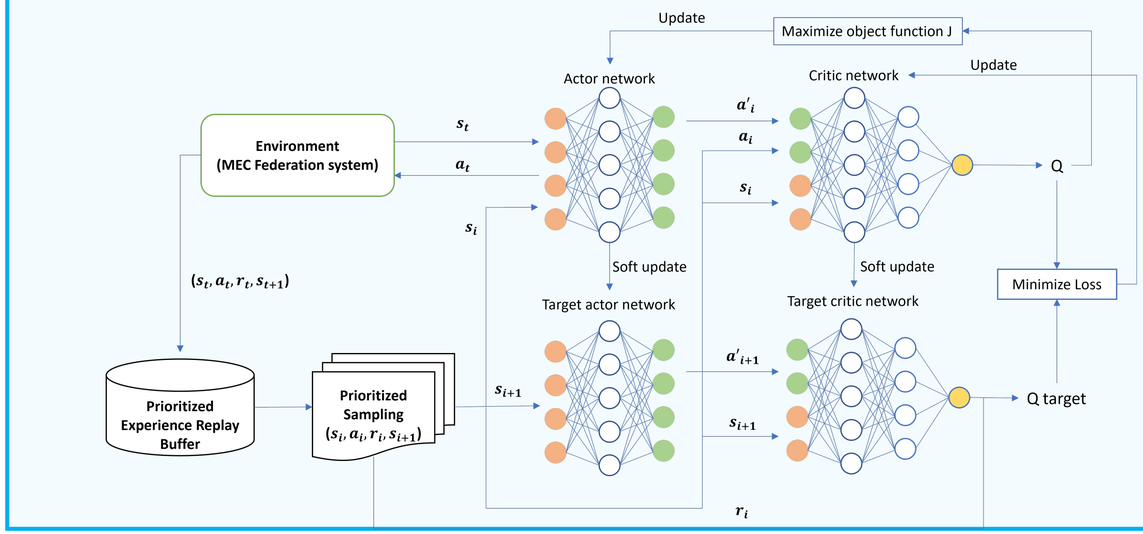


- **Objective**: Minimize the average energy-delay cost per task of whole system (IEs + fed servers) in T time slots.

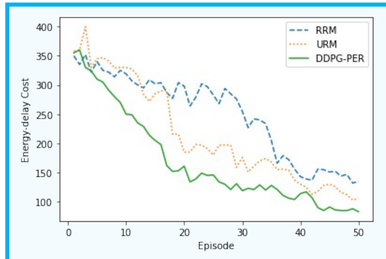
- **Constraints:**
  i. Power allocate
  ii. Memory resource allocate
  iii. Bandwidth resource of wireless link allocate
  iv. Offloading decision

Methodology

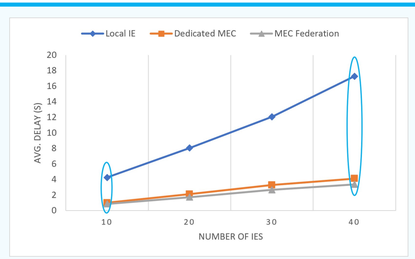
- **Define**
  - **State**: status of current whole system
  - **Action**: resource allocation, task offloading decision
  - **Reward**: (each t) negative for the average cost per task
- **DDPG-PER-based-RA framework**



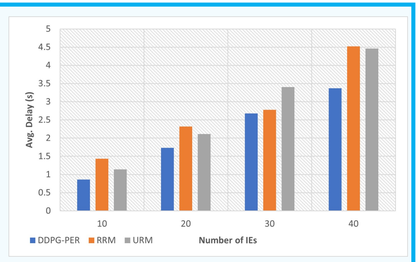
Results



Training model convergence comparison



Impact of number IEs on system model comparison



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