

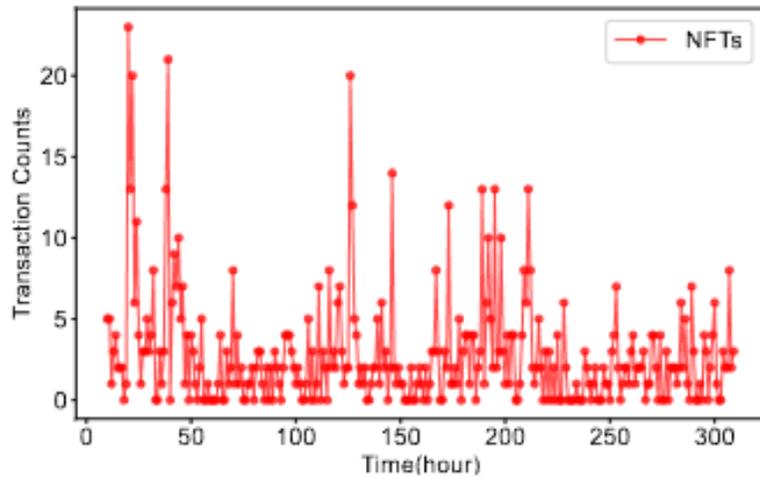
# Hammer: A General Blockchain Evaluation Framework

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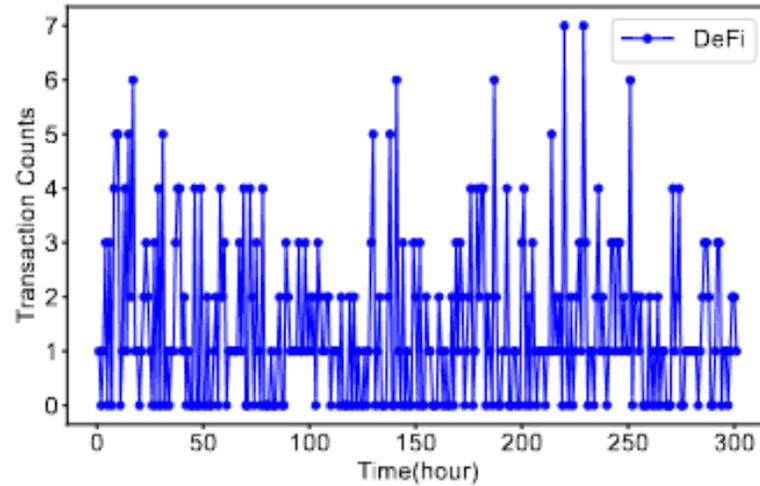
# Motivation

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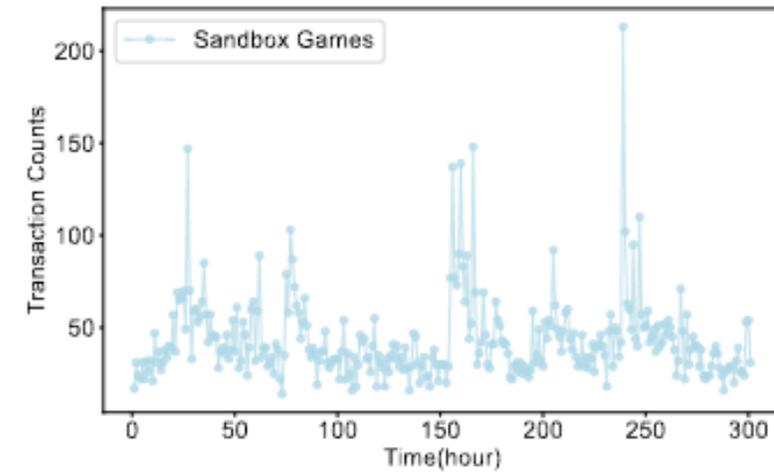
- BlockBench, Caliper, Gromit, .....
- Workload: Synthetic Workload or Replay Historical Workload



(a) NFTs



(b) DeFi



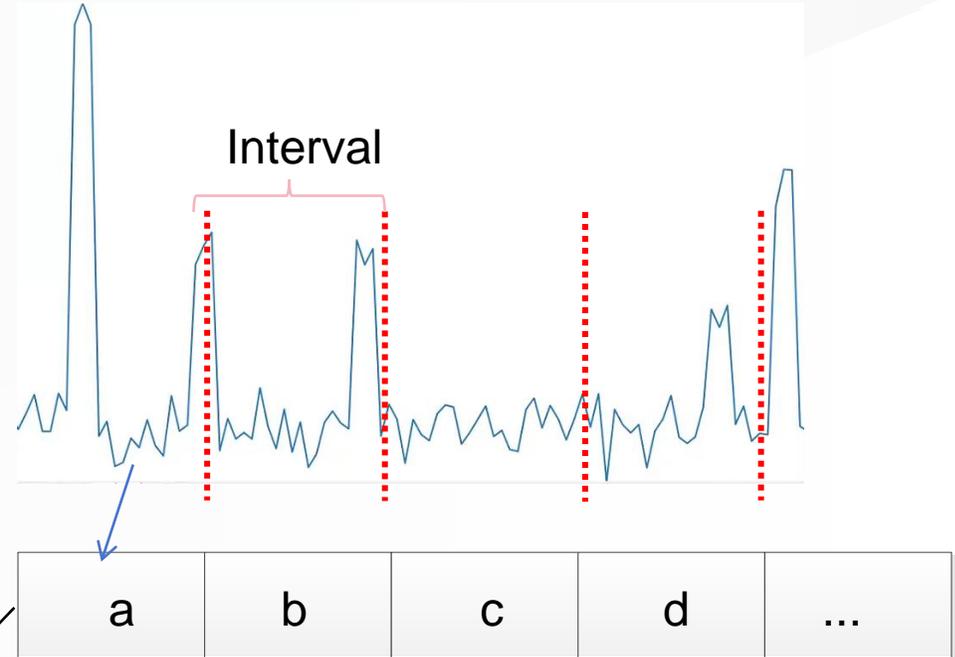
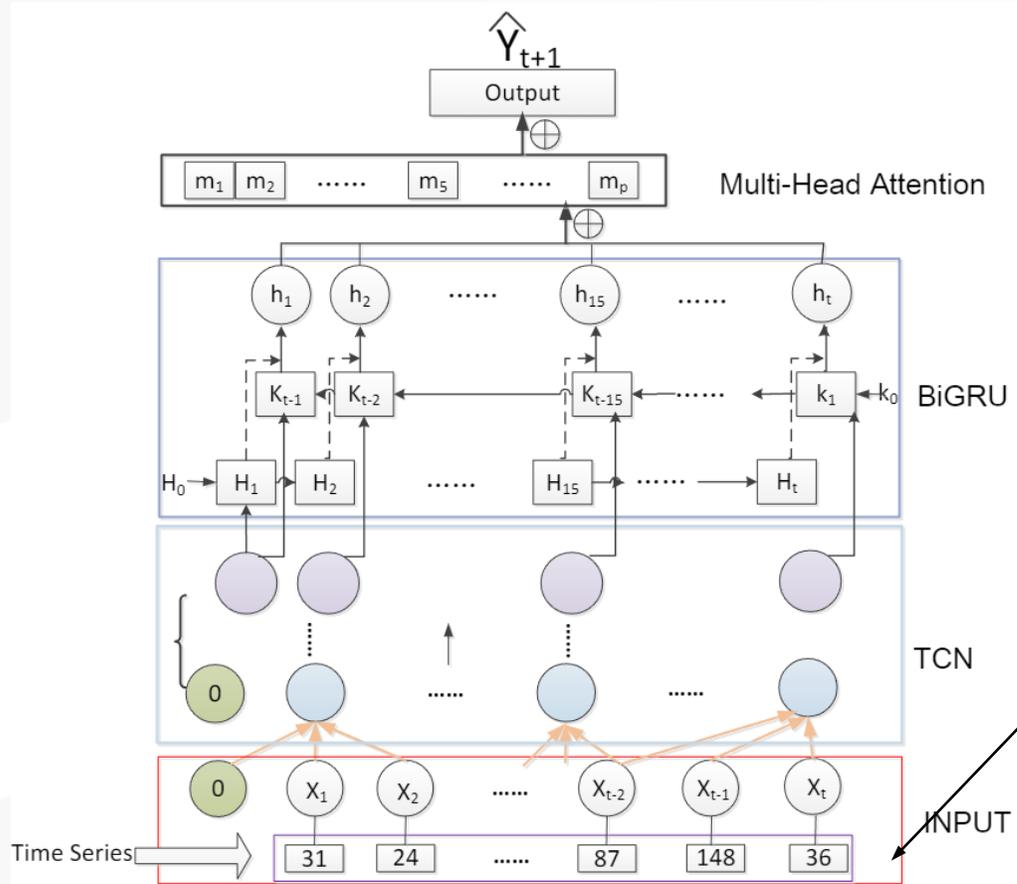
(c) Sandbox Games

# Generating Temporal Workloads

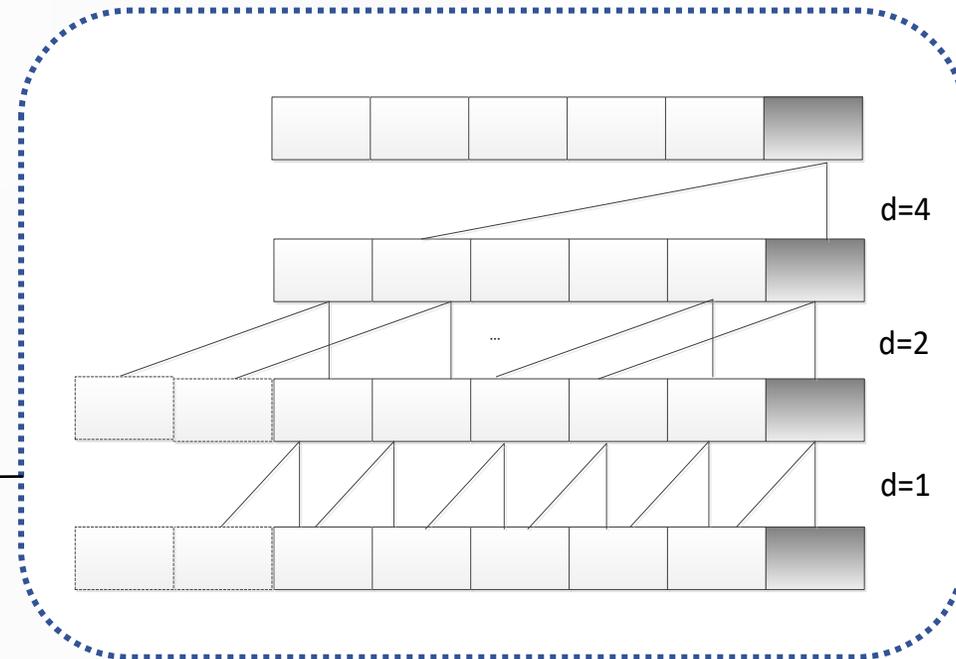
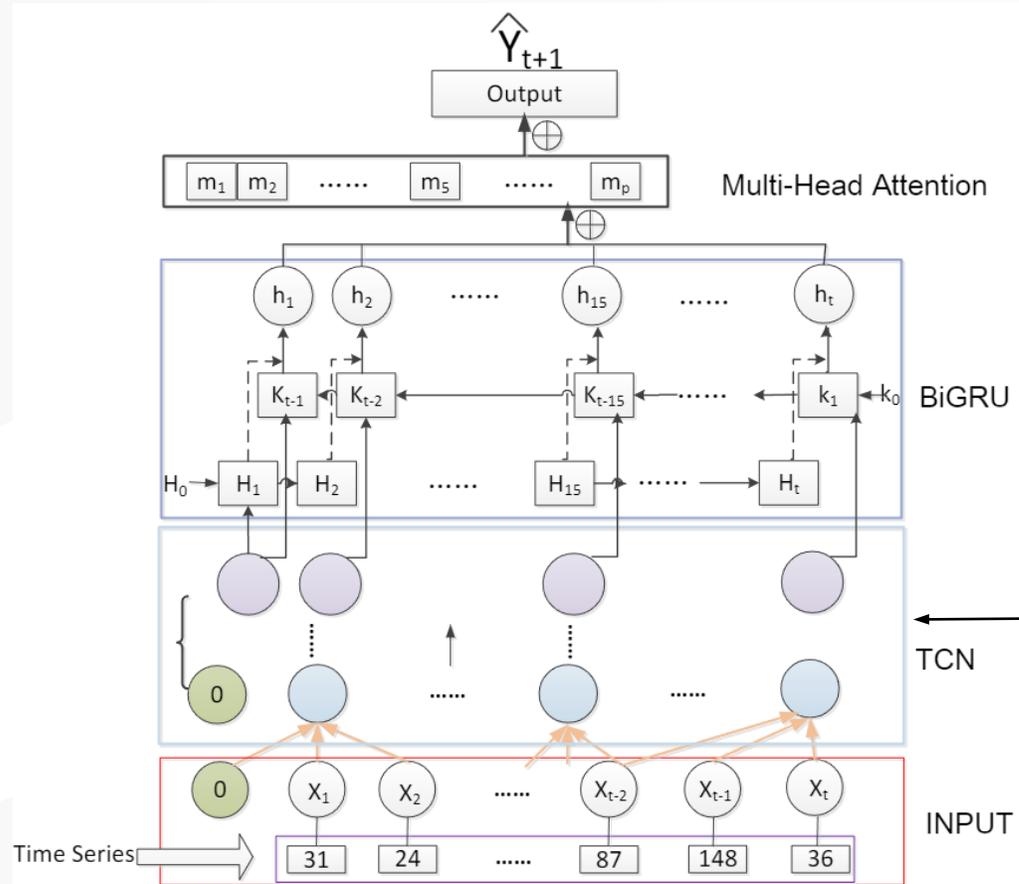
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- How can we generate workloads with temporal characteristics
- Predefined temporal data distributions, such as Gaussian and power-law.
- Learning the distribution characteristics of real-world workloads

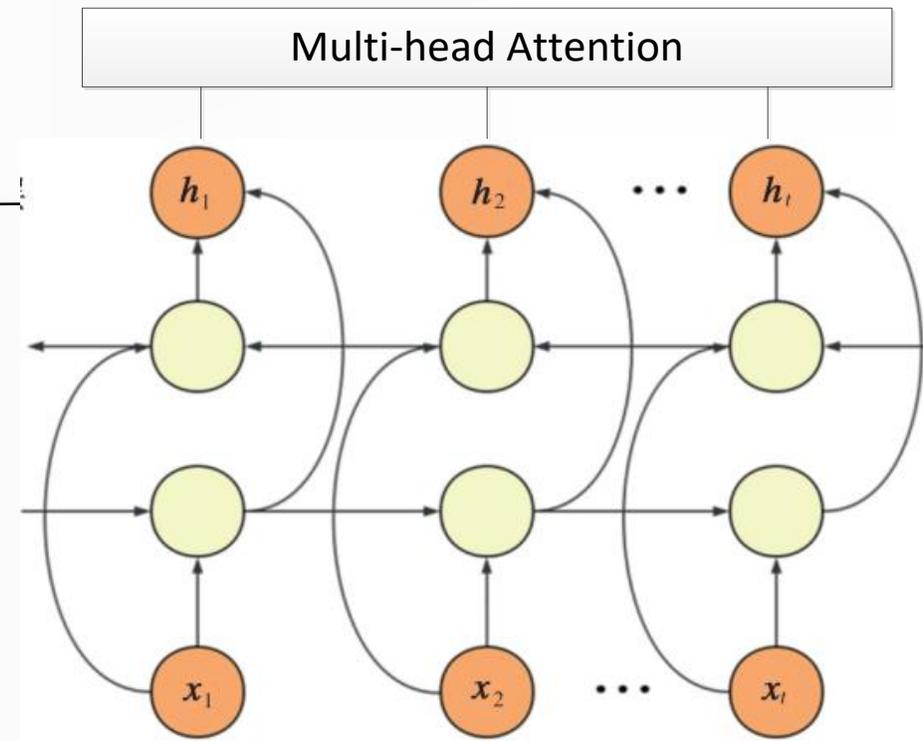
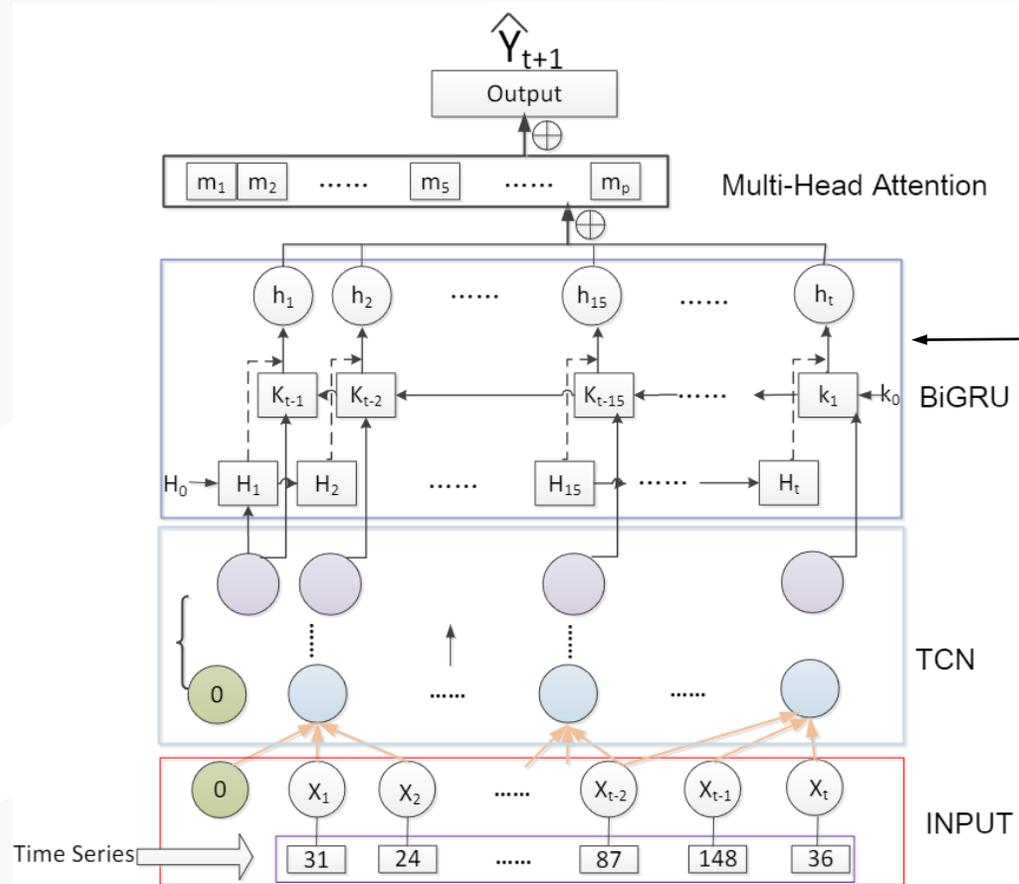
# Learning-Based Solution



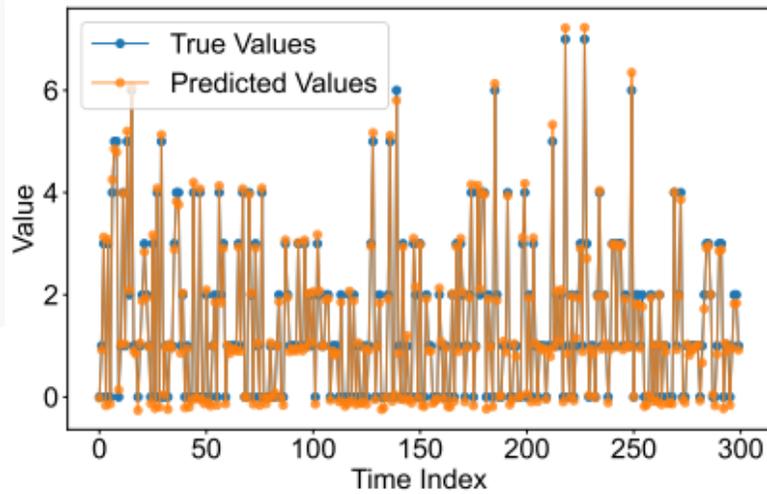
# Learning-Based Solution



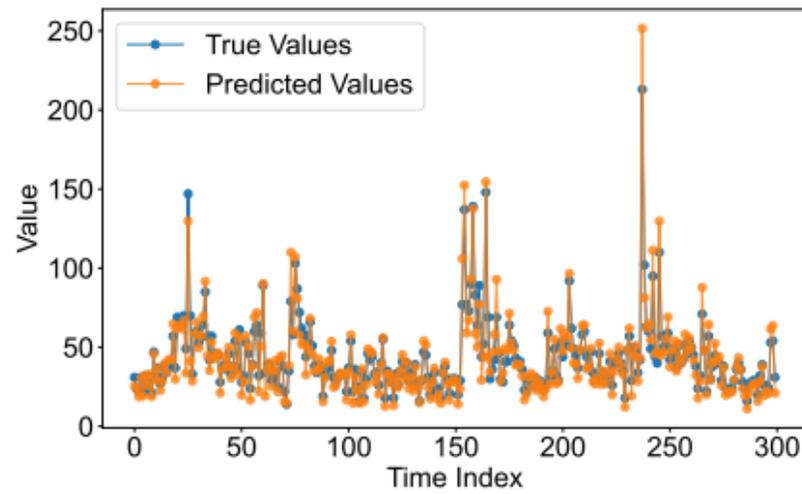
# Learning-Based Solution



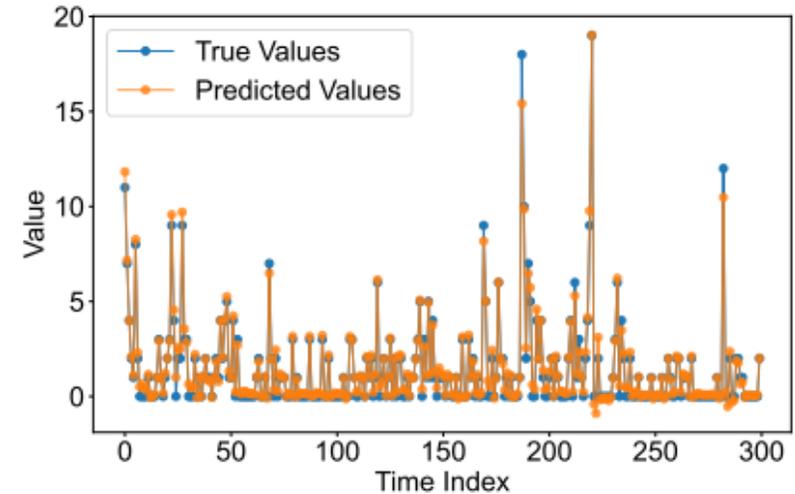
# Model Performance Evaluation



(a) DeFi



(b) SandboxGames



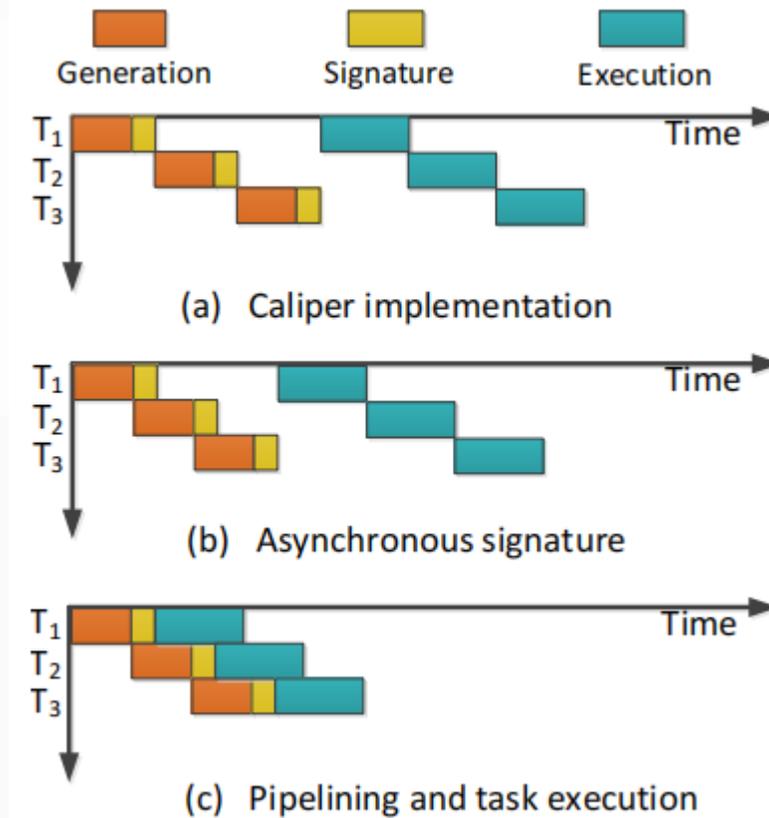
(c) NFTs

# Bottlenecks

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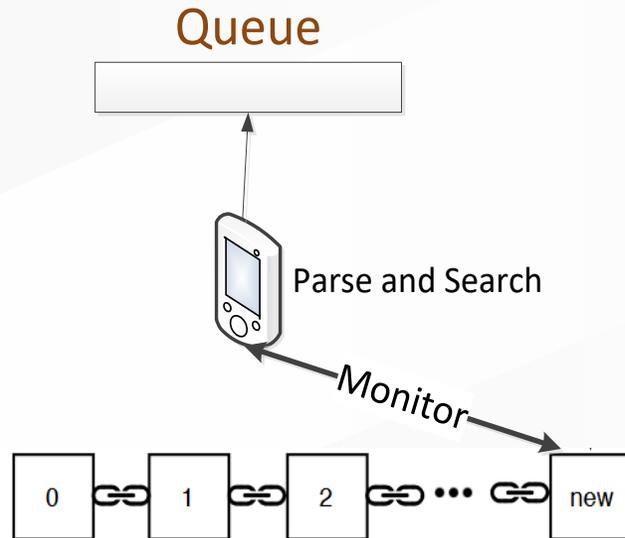
- Workload Generation Process. (Signature Time and Workload Generation Time)
- Blockchain Monitoring Methods.(Batch vs Transaction)

# Asynchronous signature and pipelining



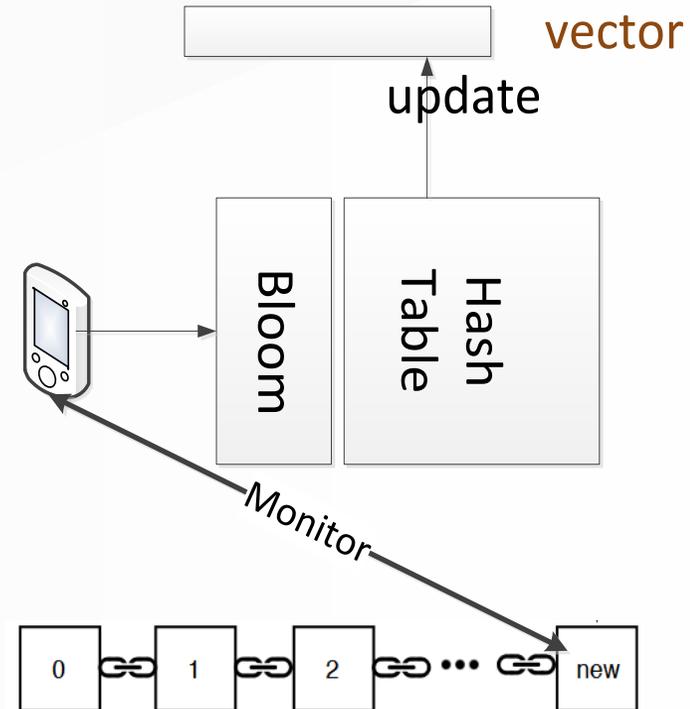
# Task Processing Algorithm

The original method



Search and Queue Deletion Time Overhead

Our



# Experiments

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- Competitors  
BlockBench , Caliper
- Workloads  
Smallbank
- Environment  
Linux ecs, 4GB RAM, Ubuntu 22.04 (64-bit)
- Blockchain Systems  
Ethereum, Fabric, Meepo, Neuchain

# Overall performance

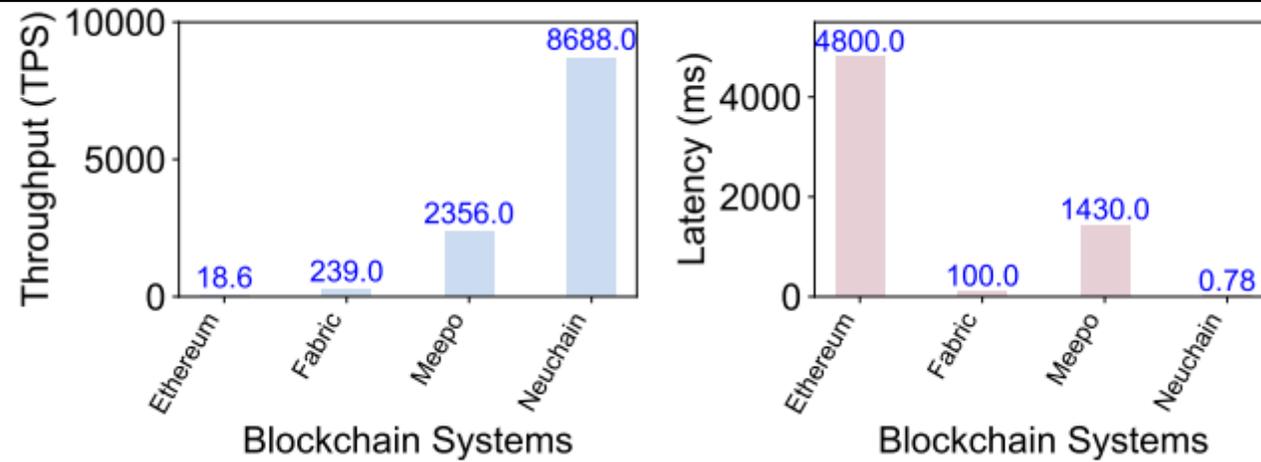


Fig1. Throughput and latency of different blockchains.

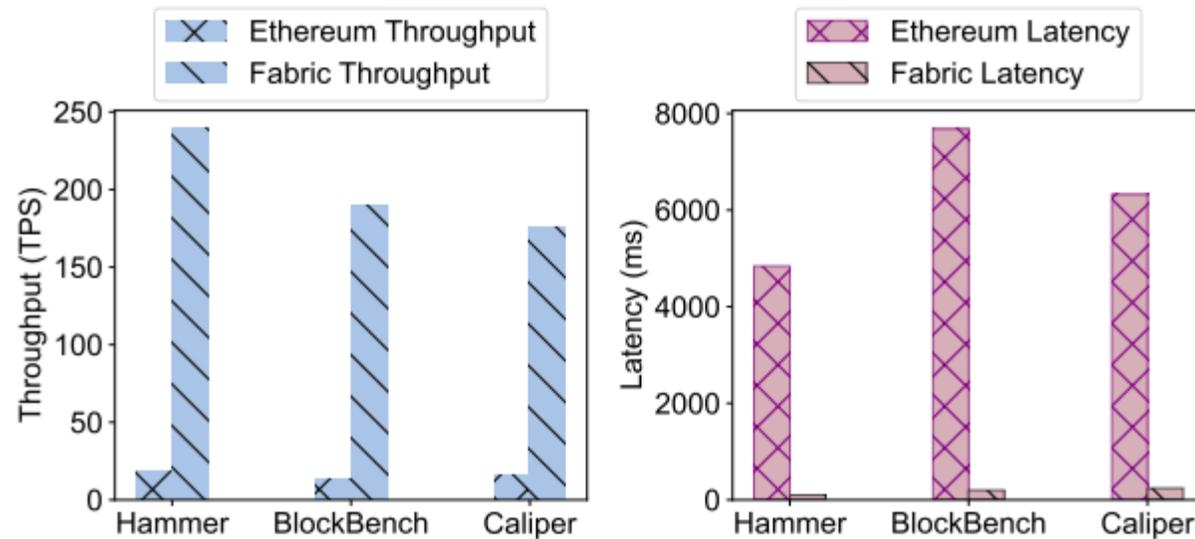


Fig2. Comparing the peak performance of the blockchains.

# Conclusion

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- We develop a general blockchain evaluation framework, namely, Hammer.
- We propose a series of optimization algorithms to enhance the performance of the evaluation framework.
- We propose a learning-based approach to capture the characteristics of temporal workloads.

**Thank you for listening!**