

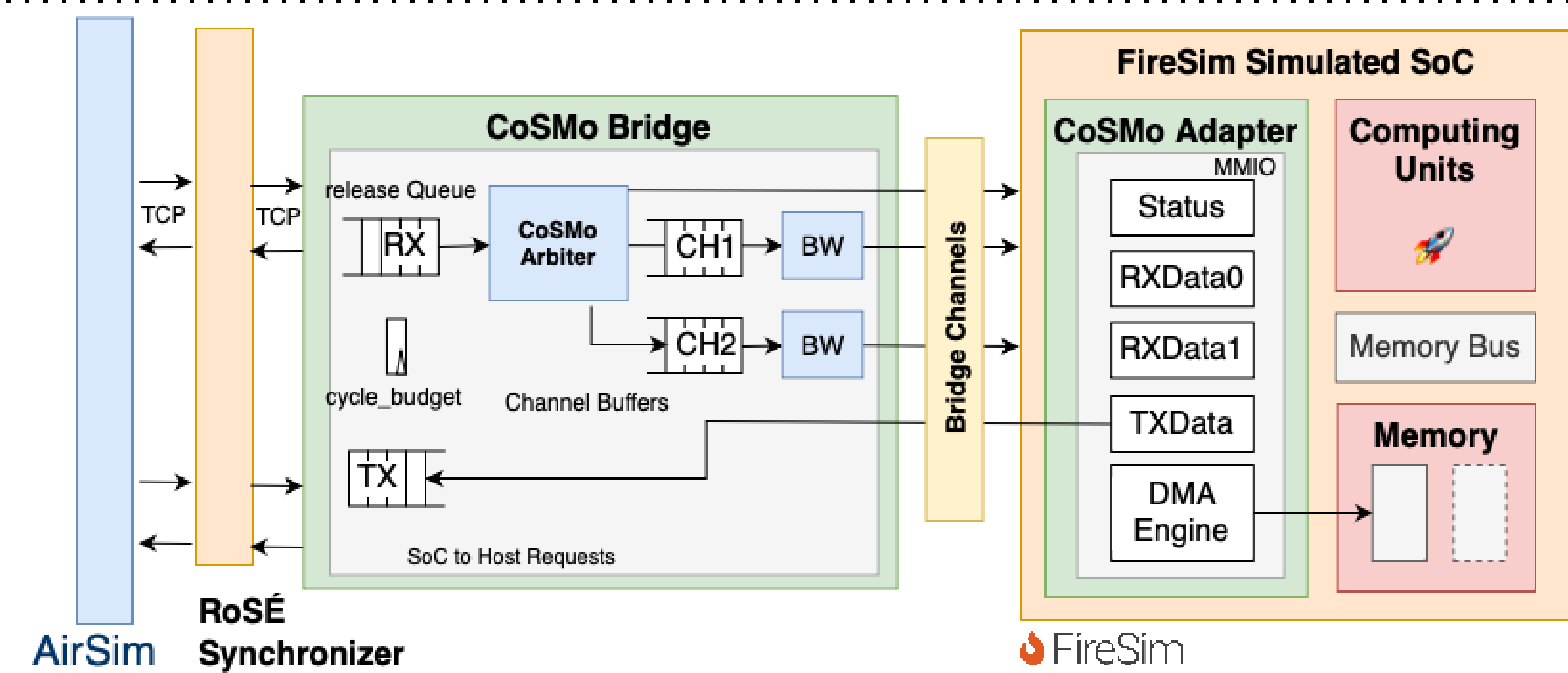


## Motivation

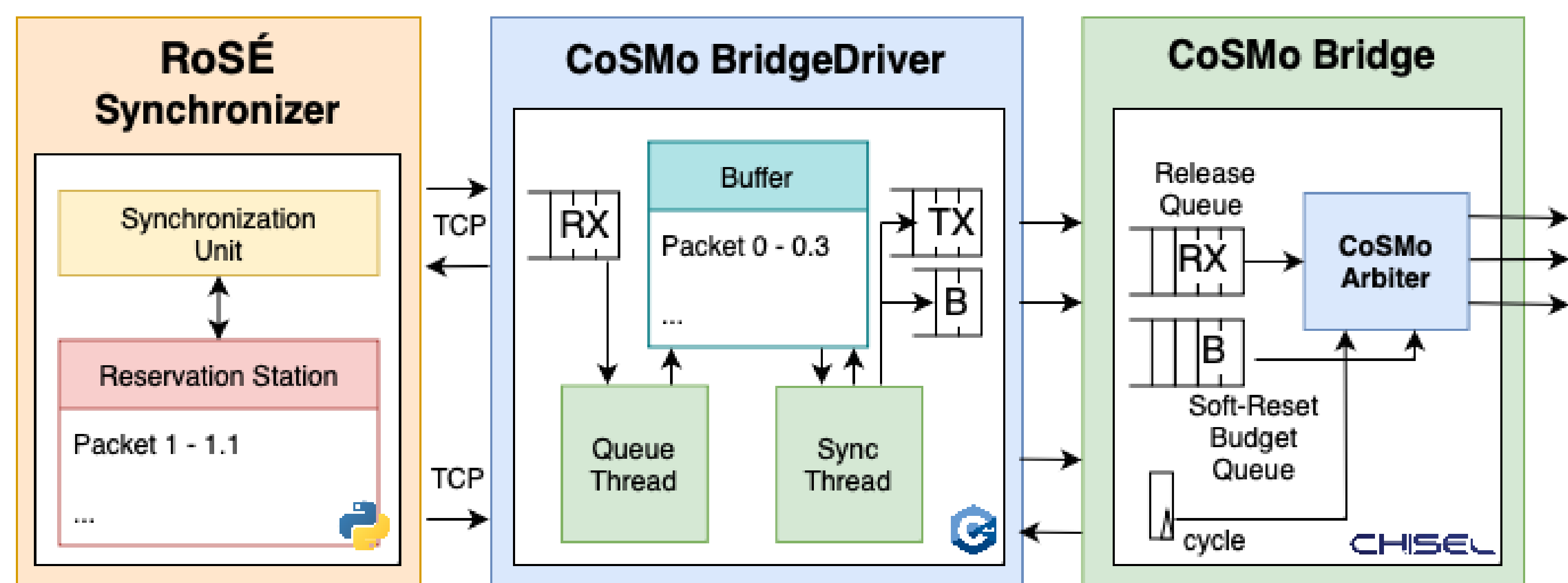
Robot maximum speed is restricted by sensor/perception latency. To effectively design robotics SoCs, it is critical to build end-to-end evaluation platform that models sensor behavior.

## Methodology

### System Architecture

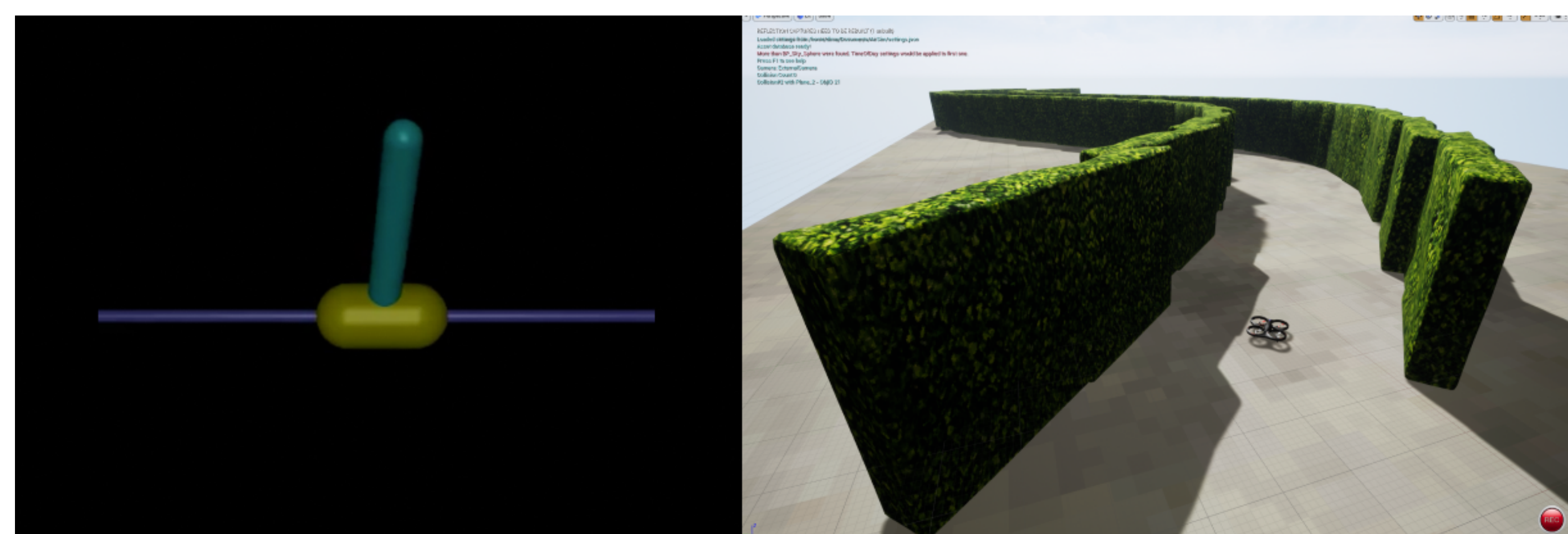


### Latency Injection



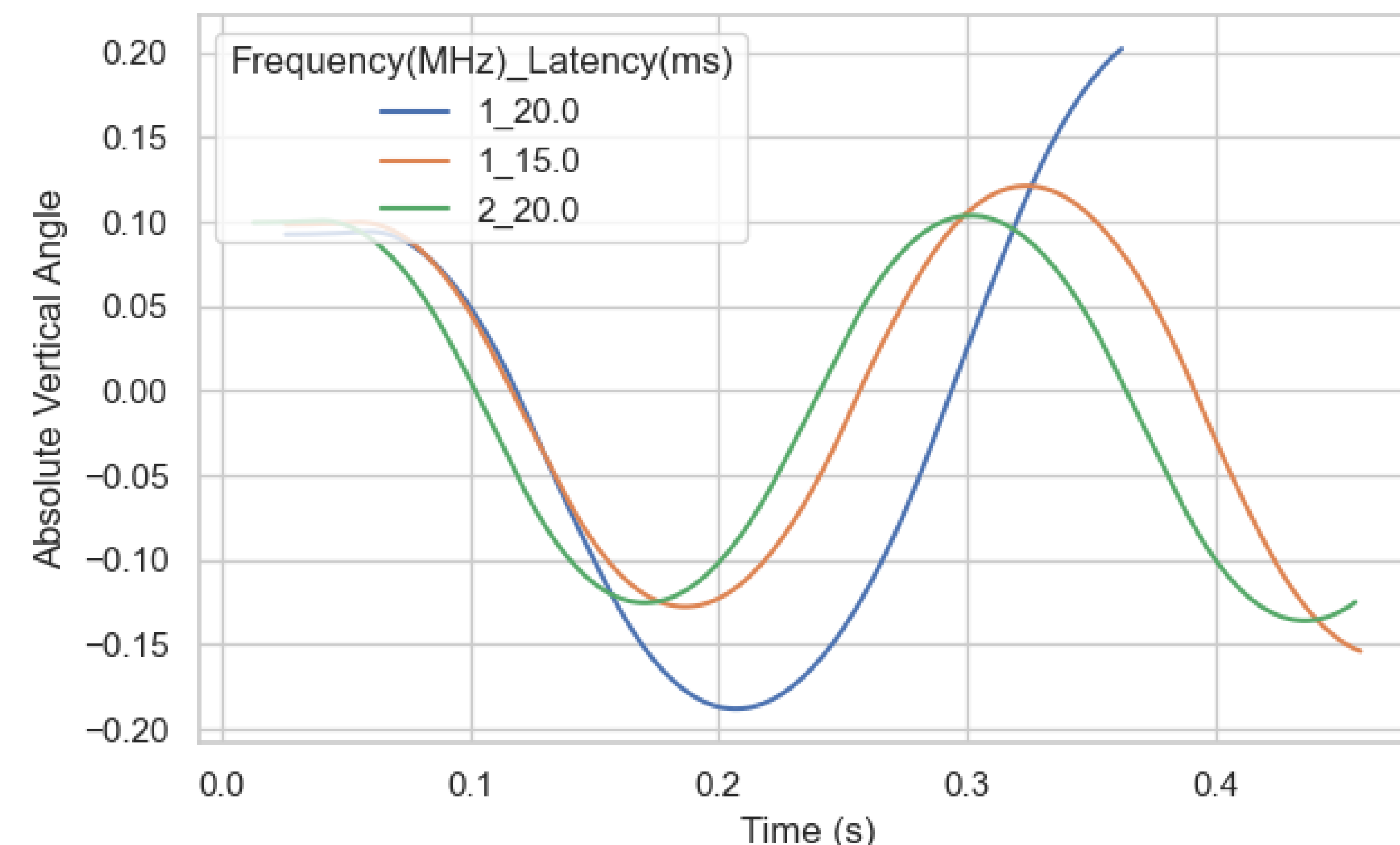
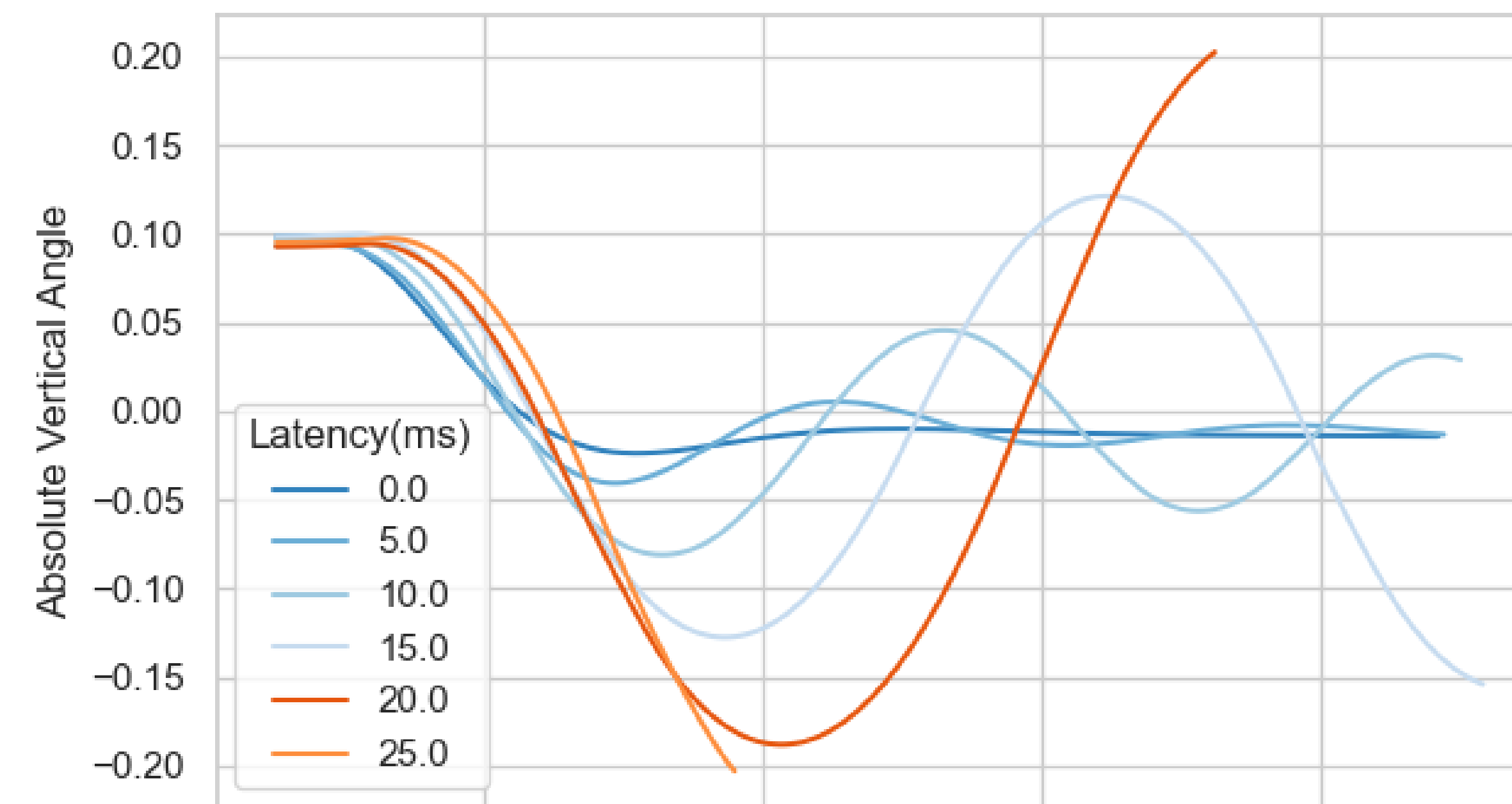
## Case Studies

### Environments

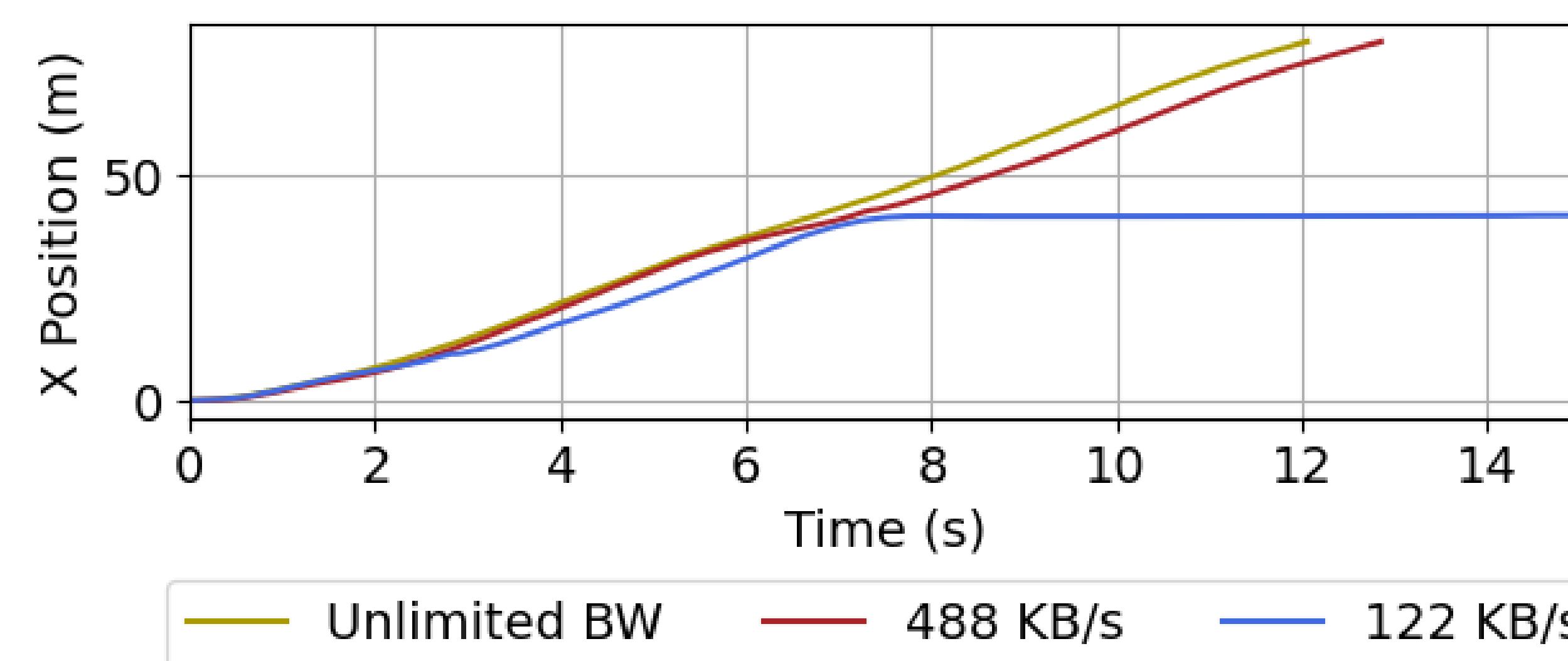
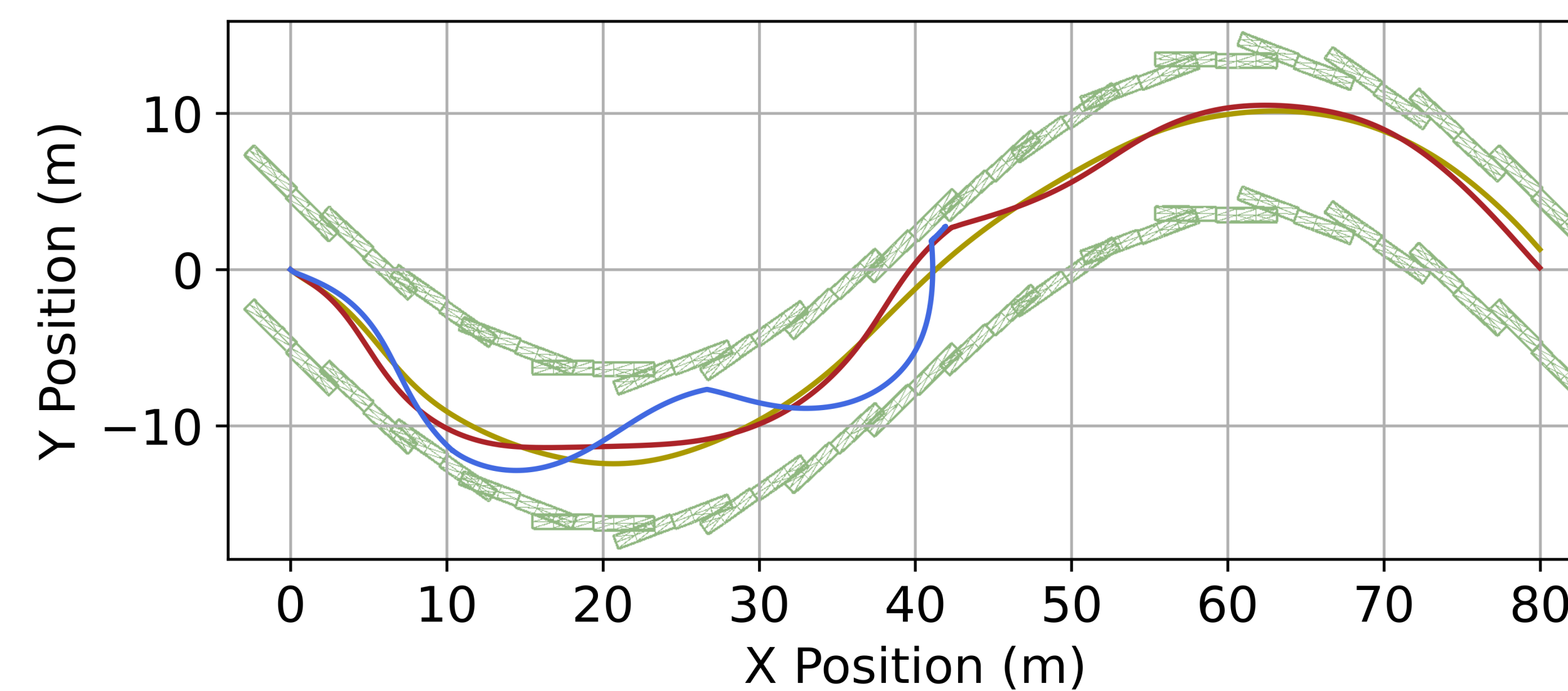


**Figure:** Left: An inverted pendulum robot stabilizes using PID algorithm. Right: A quadcopter visually navigates a trail using a ResNet14 planner.

## Inverted Pendulum Stabilization

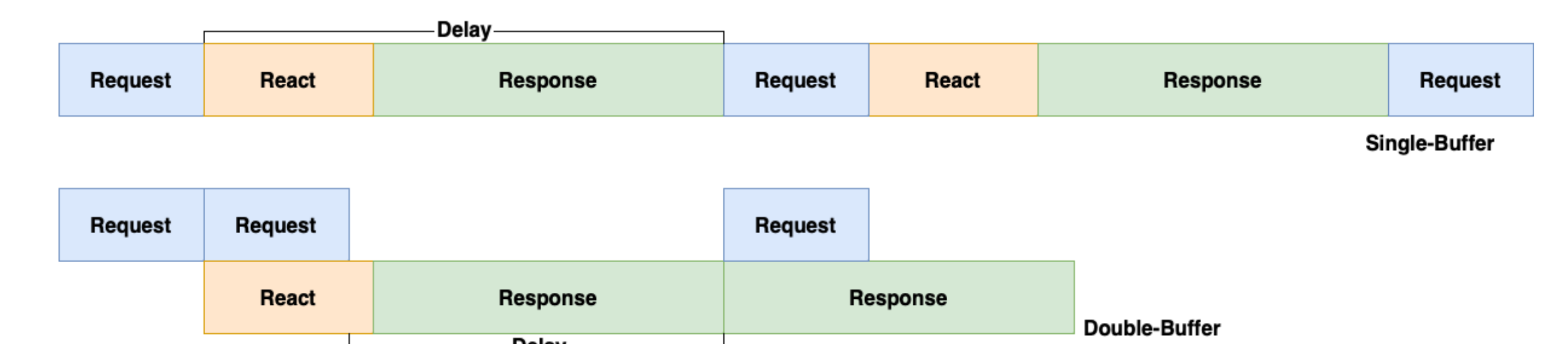
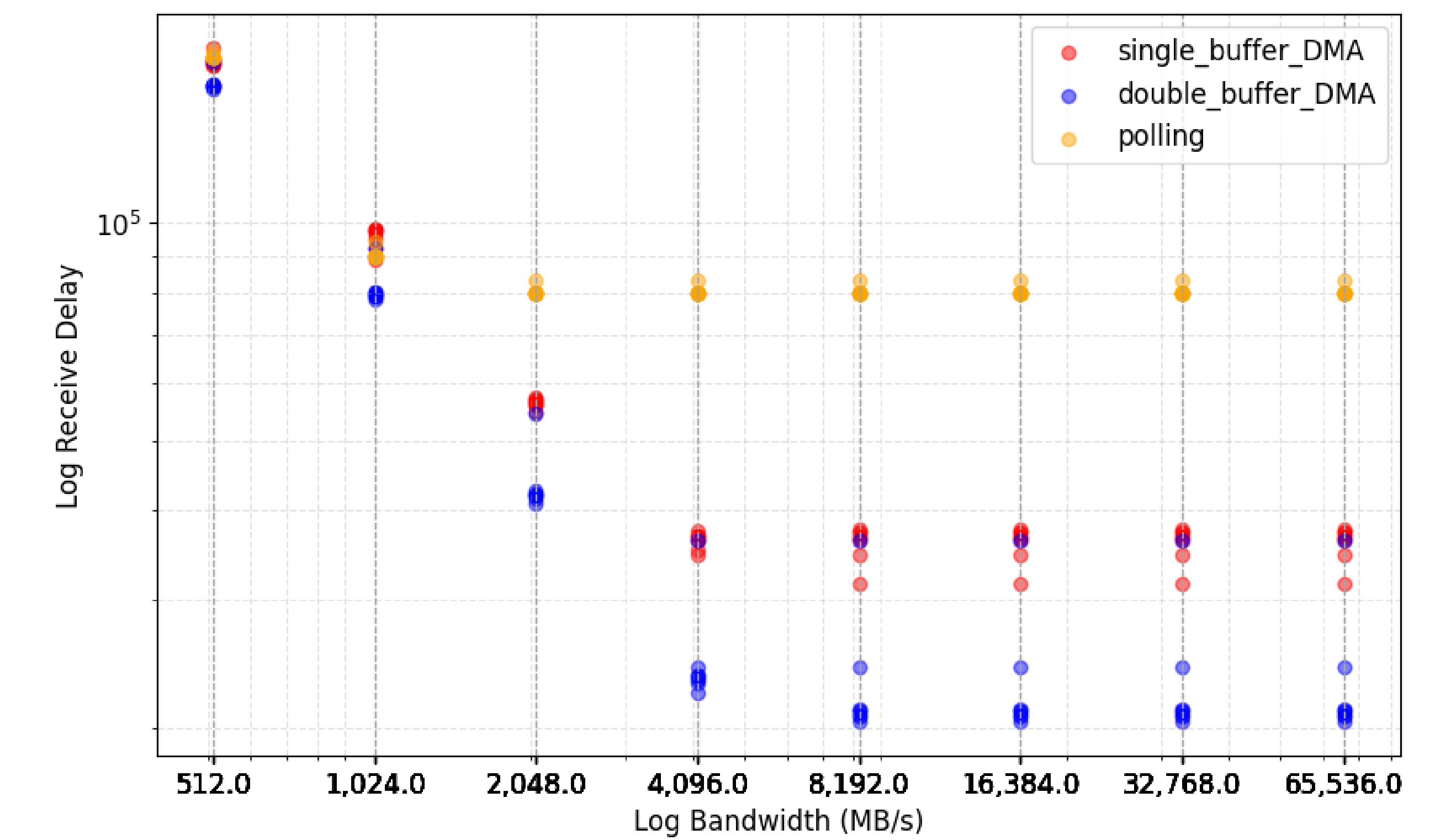


## DNN Trail Navigation



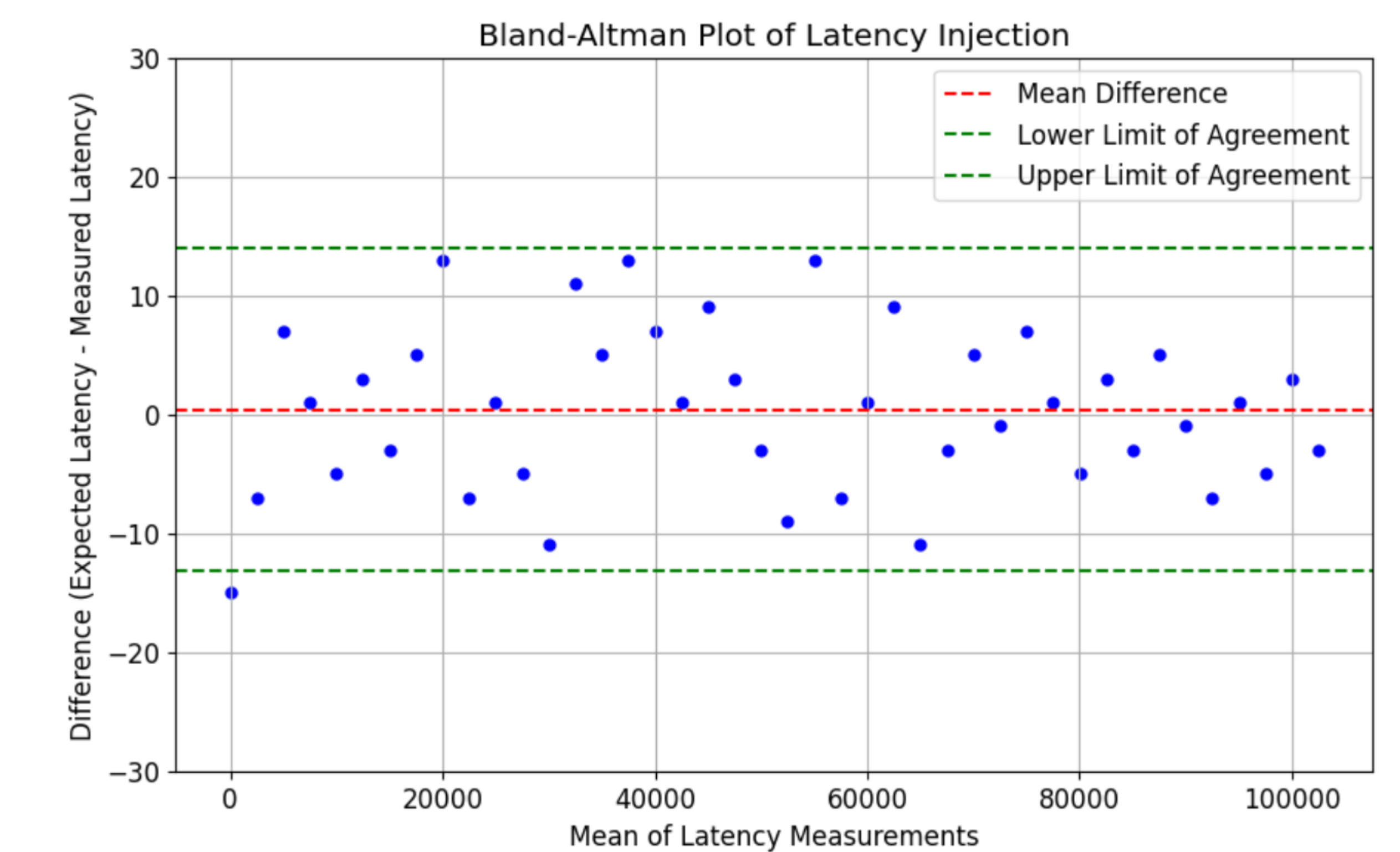
## Evaluation

### Interface and Bandwidth Throttling



**Figure:** Software pipelining with double-buffering DMA

### Latency Injection



## Acknowledgement

This work is advised by Dima Nikiforov and Professor Sophia Shao from UC Berkeley.