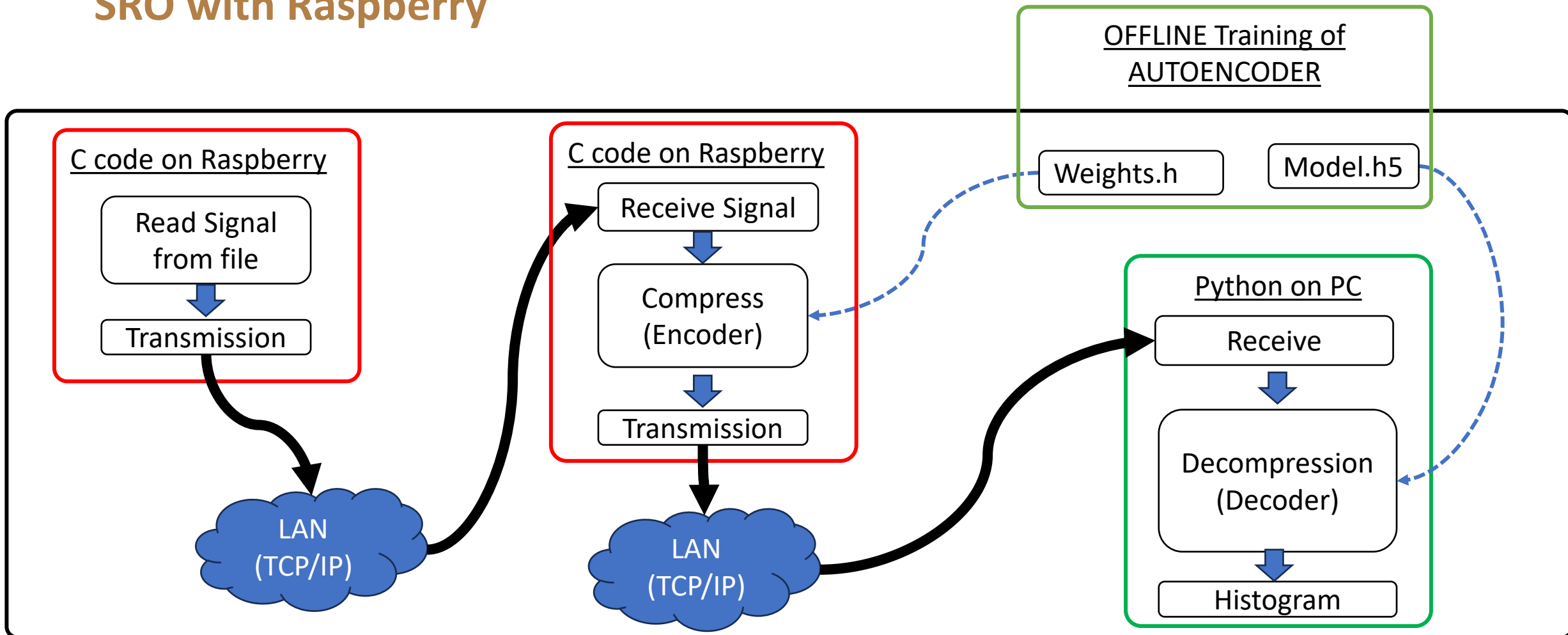
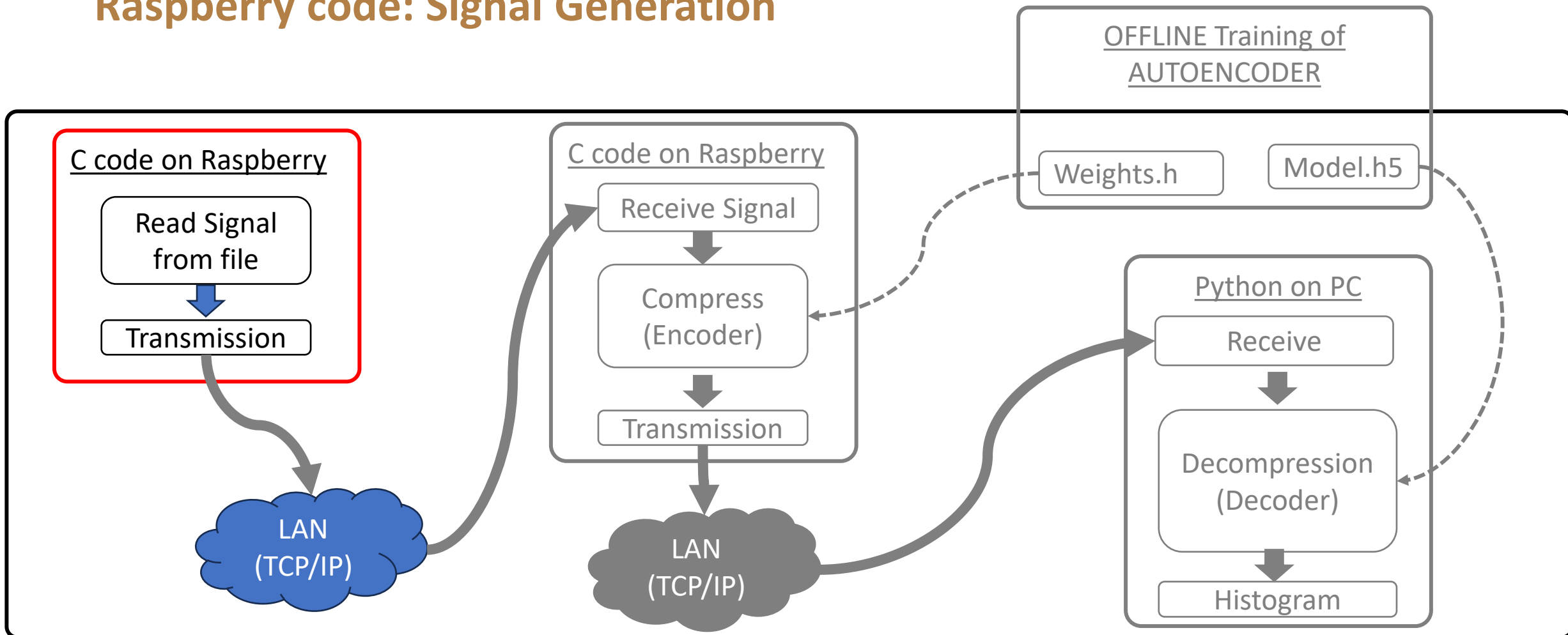


SRO with Raspberry



Raspberry code: Signal Generation

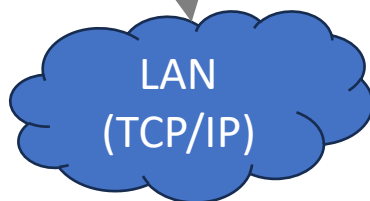
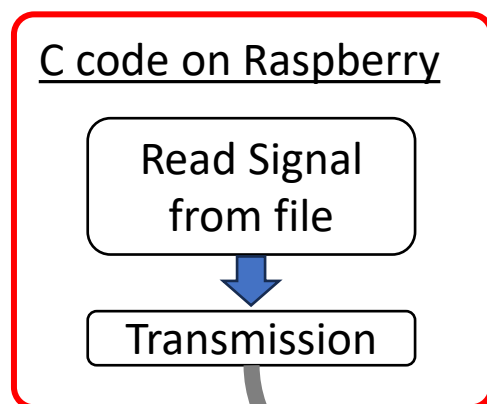


Raspberry code: Signal Generation

Program operations:

1. Code reads signal from file and store in memory
2. Code build a client socket connection
3. Every 1ms a signal is sent

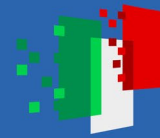
Next step is to try a timing with statistical distribution instead of fixed frequency



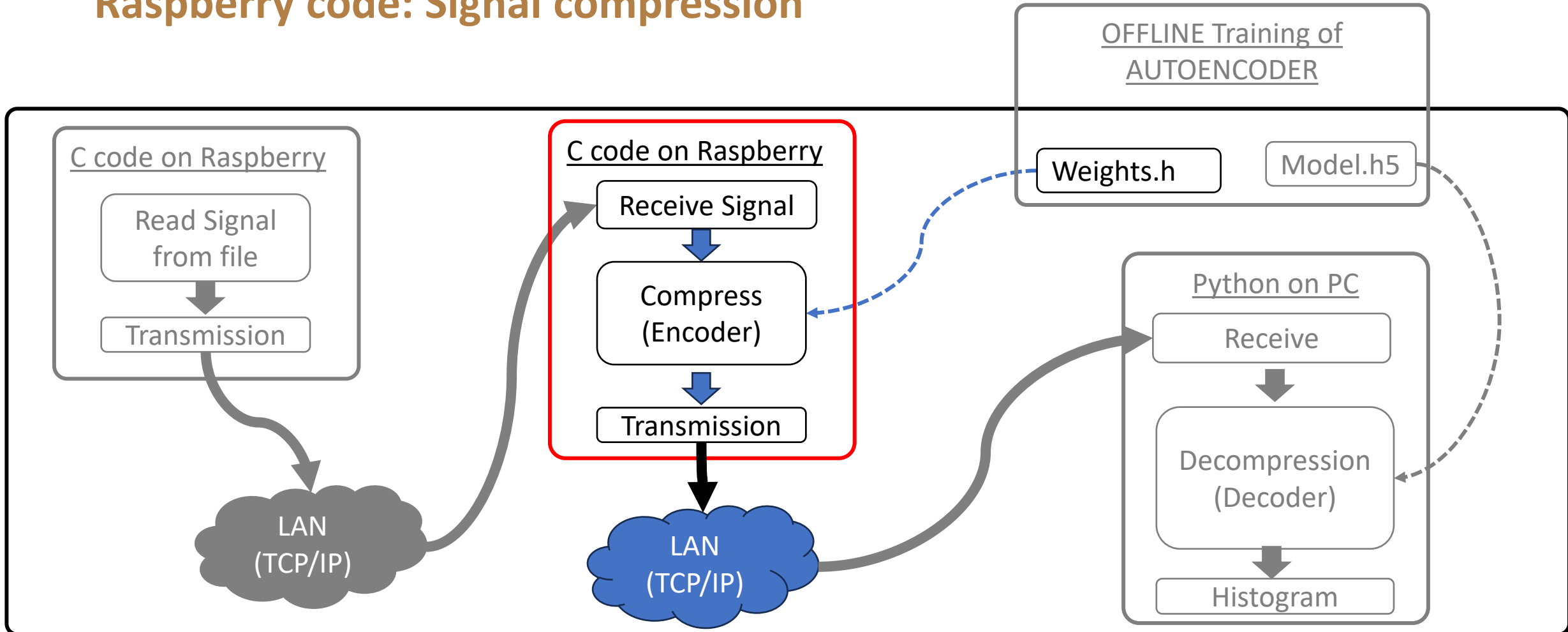
```
#!/*  
 * Signal for Streaming Read Out  
 */  
struct SRO_Sgn  
{  
    uint32_t Id;  
    uint32_t TimeStamp;  
    uint32_t Time_s;  
    uint32_t Time_ms;  
    uint32_t Sample[48];  
};
```

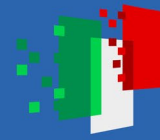
Some information are added to the signal:

- Raspberry unique code
- Signal unique code
- Signal trasmission time
- Signal from Gagik's database

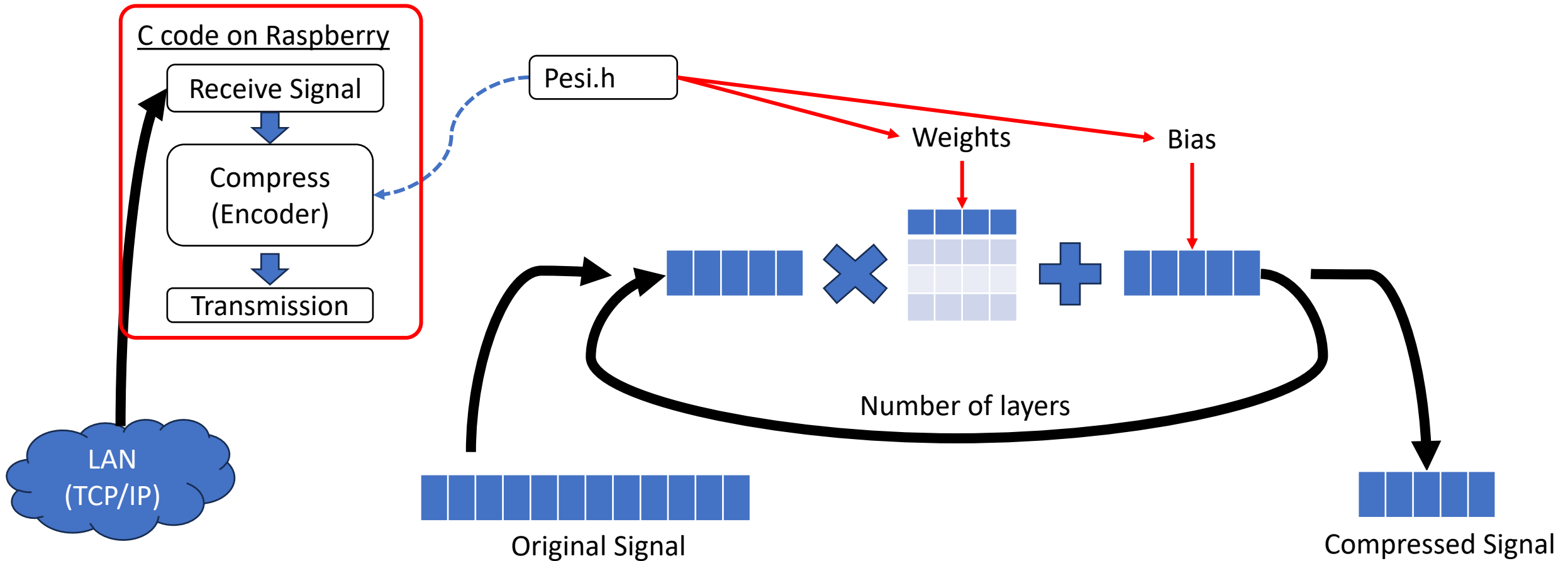


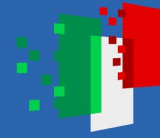
Raspberry code: Signal compression





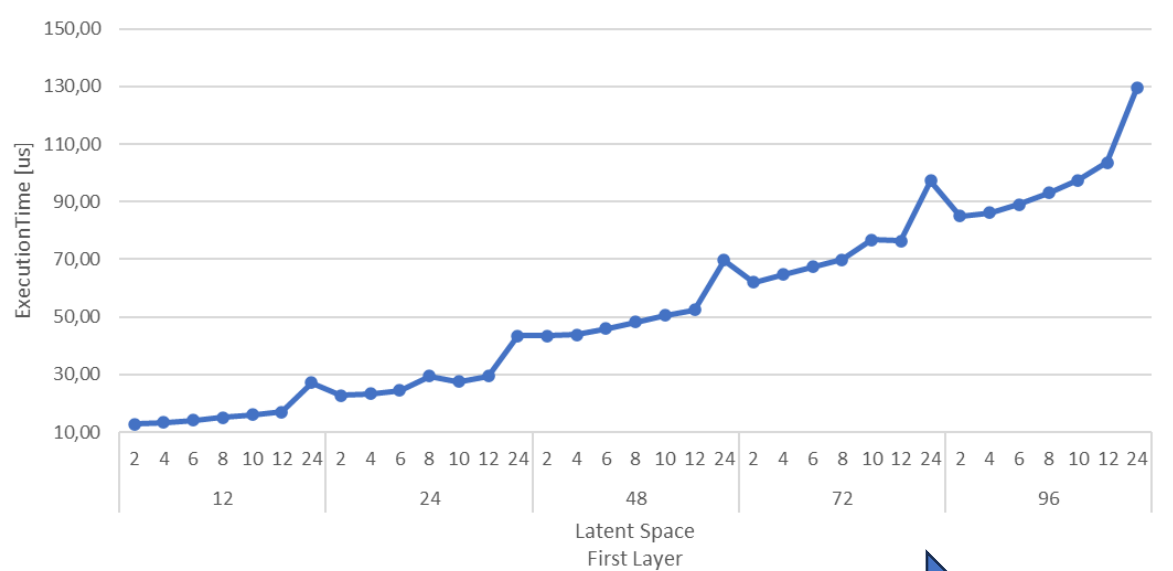
Signal Compression





Execution time on Raspberry

Compress signal execution Time



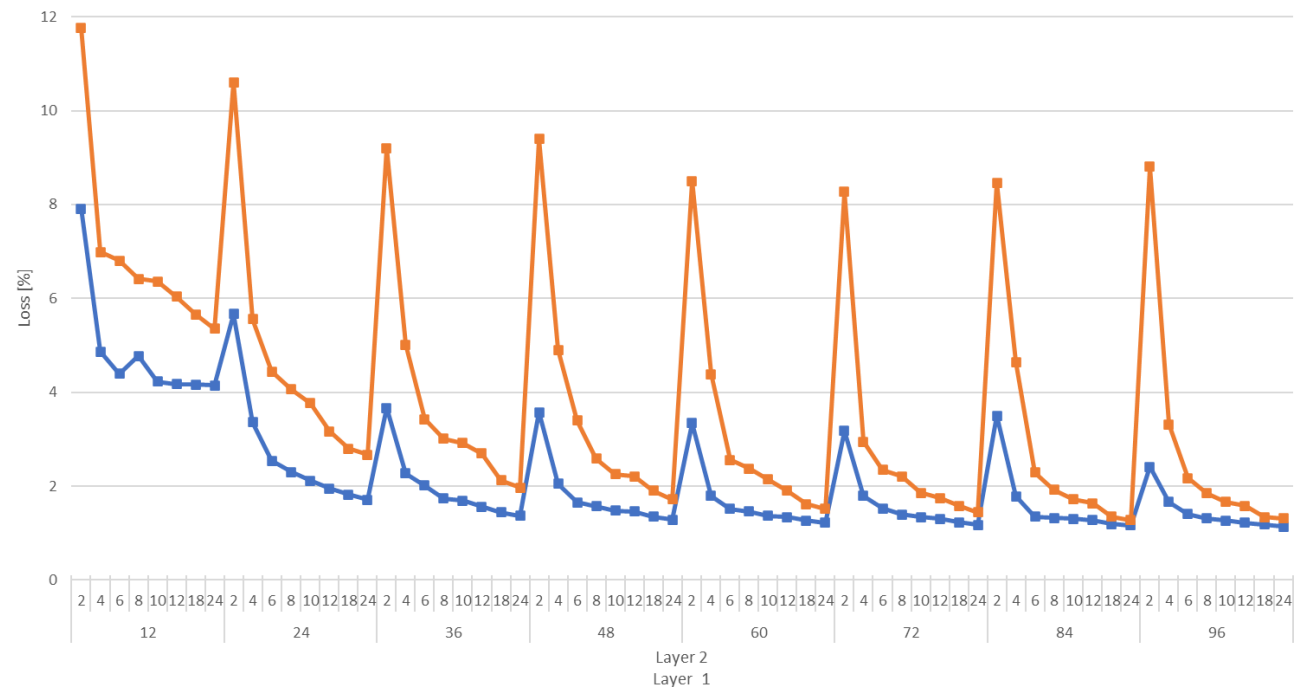
Increasing Model Complexity

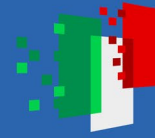
Model: RASPBERRY PI4

Quad core Cortex-A72 (ARM v8)

C code without any optimizations

Loss % of different configurations





Timing of compression with different hardware

GPU

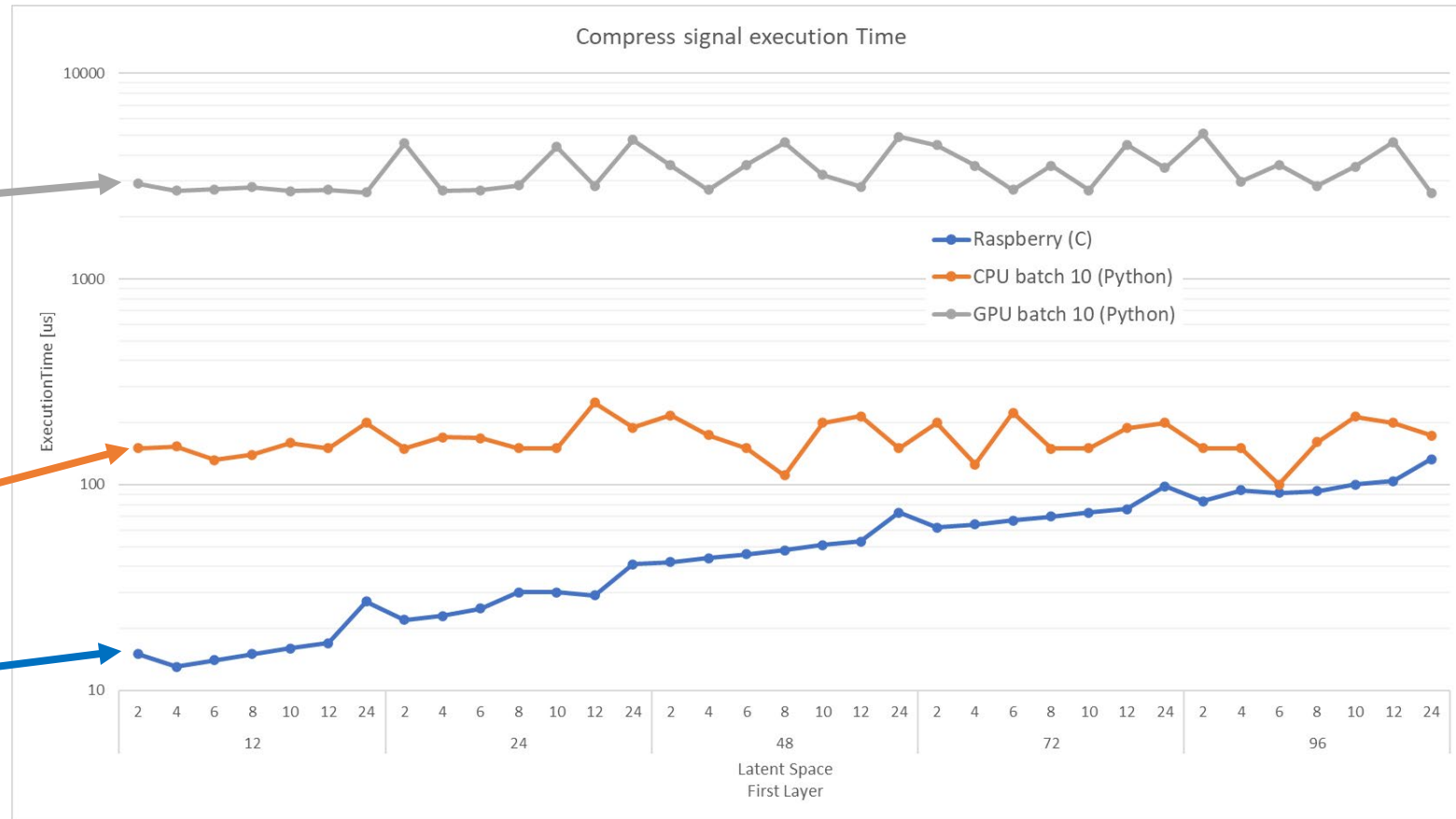
```

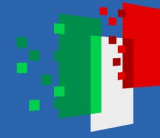
NVIDIA-SMI 535.104.12          Driver
-----
GPU  Name                    Persistence-M
Fan  Temp    Perf              Pwr:Usage/Cap
-----
  0  Tesla V100-SXM2-32GB      Off
    N/A   38C    P0              60W / 300W
-----
  1  Tesla V100-SXM2-32GB      Off
    N/A   38C    P0              58W / 300W
-----
  2  Tesla V100-SXM2-32GB      Off
    N/A   38C    P0              59W / 300W
-----
  3  Tesla V100-SXM2-32GB      Off
    N/A   39C    P0              58W / 300W
  
```

CPU

AMD Ryzen 5 5600U
6 core, 12 Logic processor

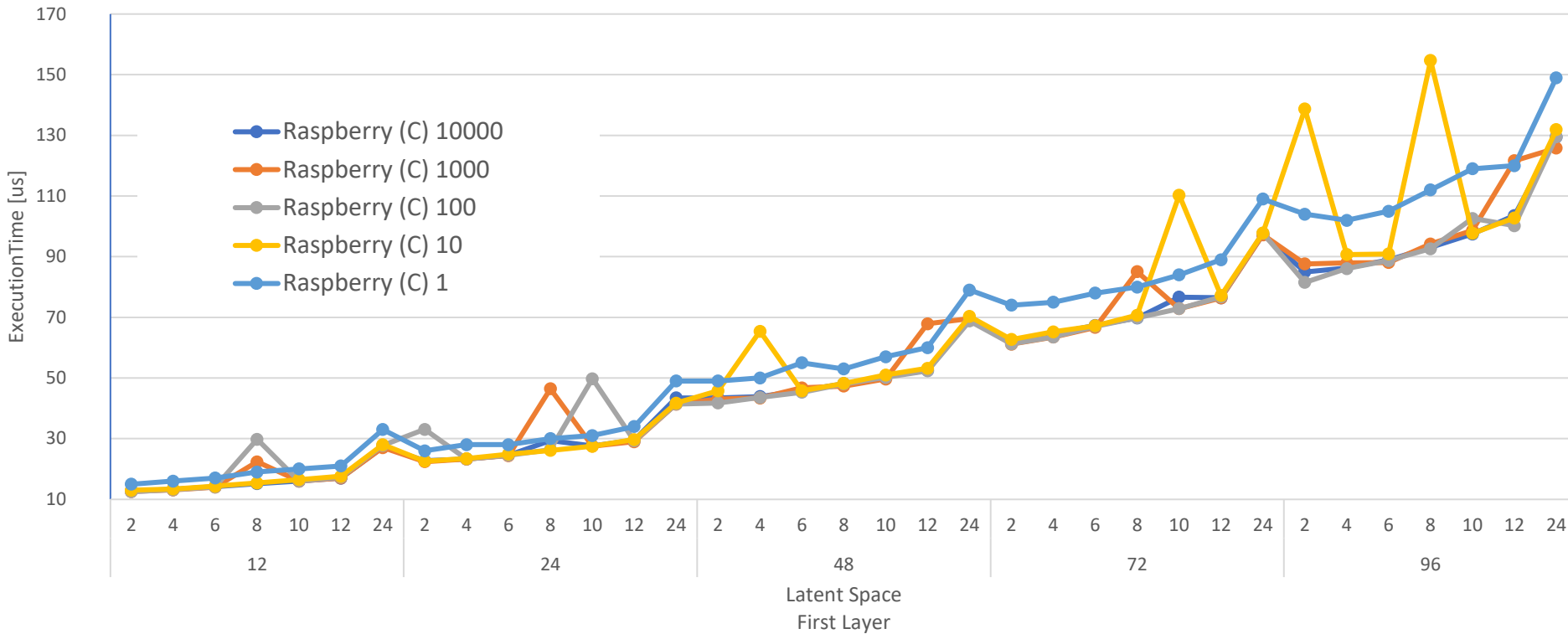
RASPBERRY PI4 (C code)
Quad core Cortex-A72 (ARM v8)



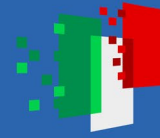


Timing of compression with different hardware: Batch considerations

Compress signal execution Time

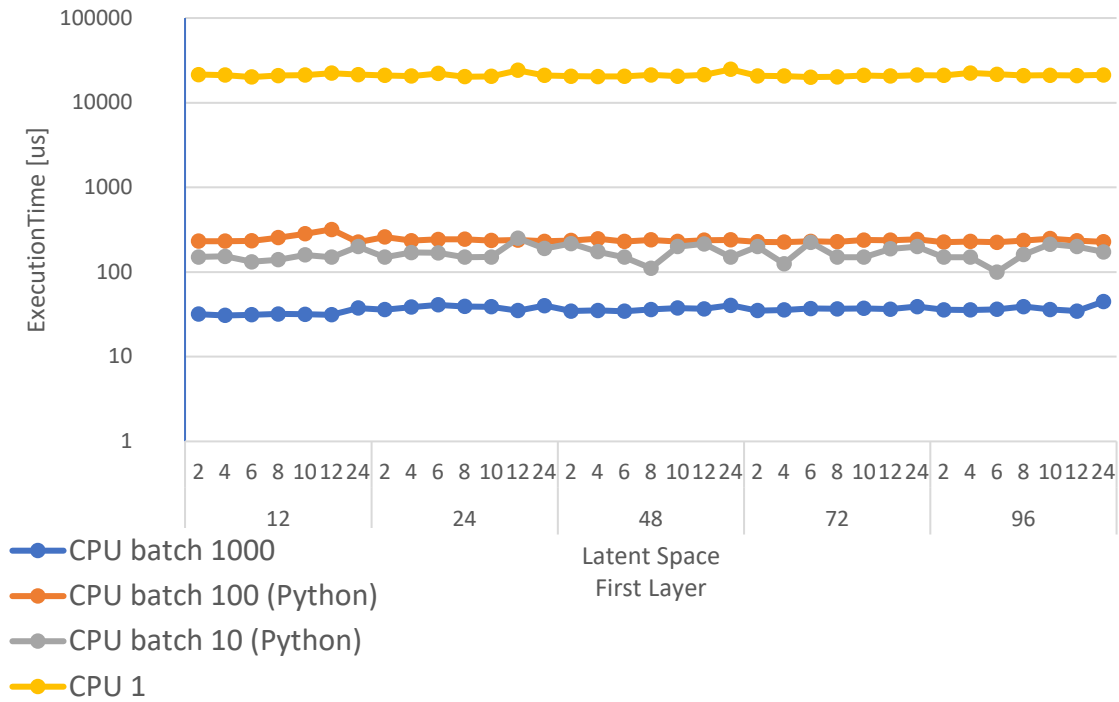


Same execution time
For different batch of data

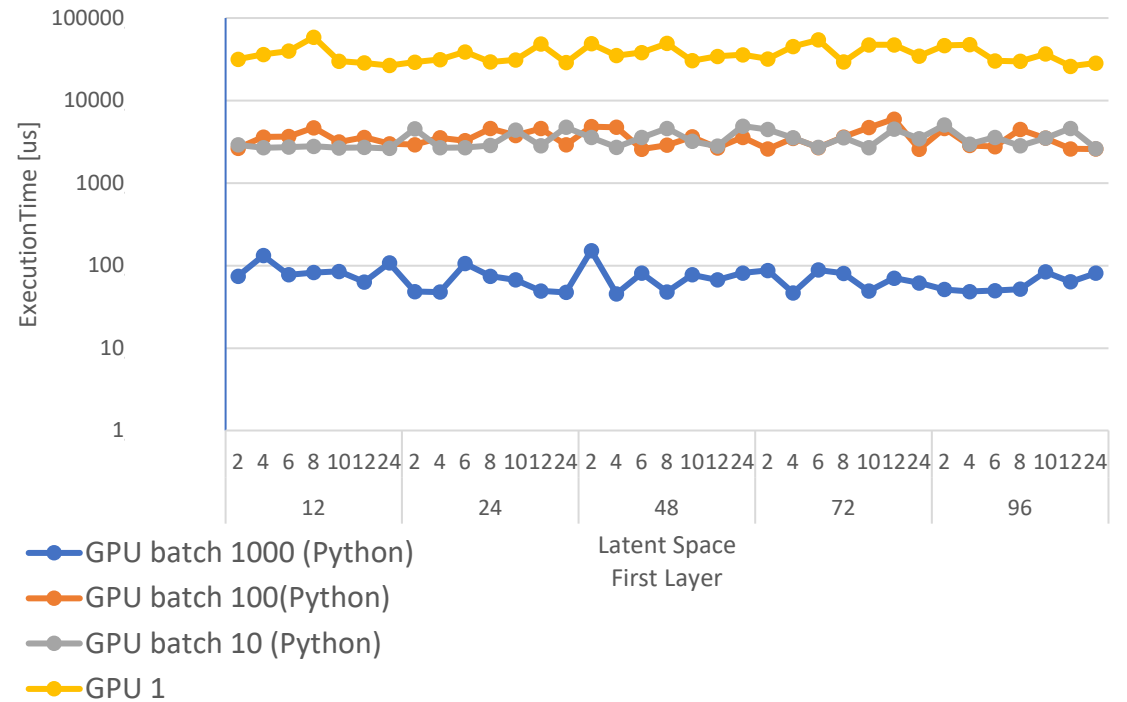


Timing of compression with different hardware: Batch considerations

Compress signal execution Time



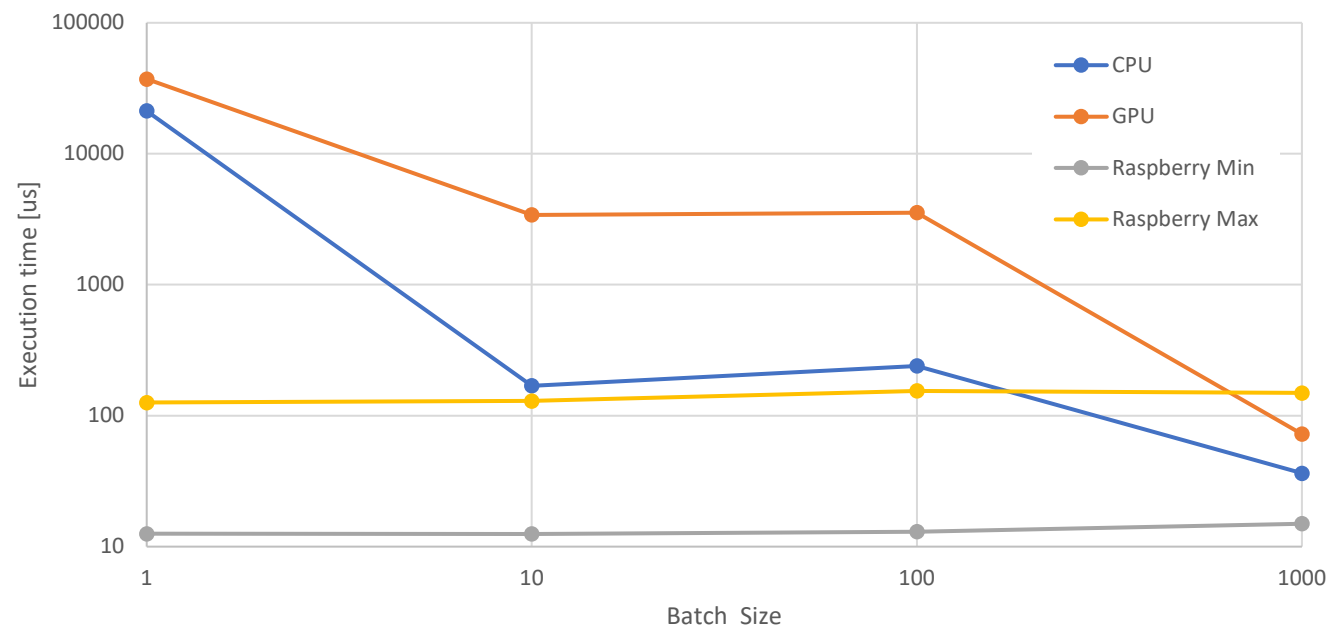
Compress signal execution Time





Timing of compression with different hardware: Batch considerations

Execution time VS batch size

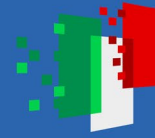




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Italiadomani
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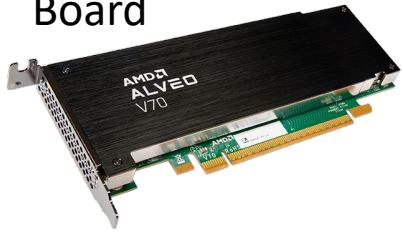


Future
Artificial
Intelligence
Research

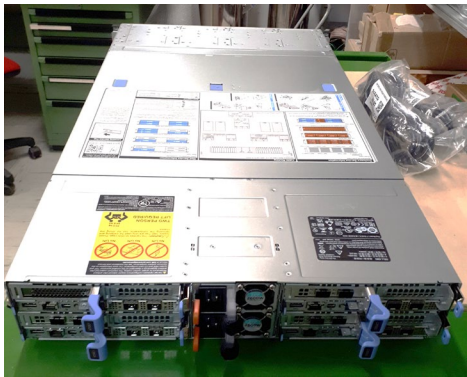
More Realistic Scenario

Available hardware

2 ALVEO V70 FPGA
Board



4 Server DELL C6400



what we're looking for developing.

