Choose the Right Hardware

Proposal Template

Scenario 1: Manufacturing

Client Requirements and Potential Hardware Solution

Look through the scenario and find any relevant client requirements. Then, suggest a potential hardware type and explain how this hardware would satisfy each of the requirements.

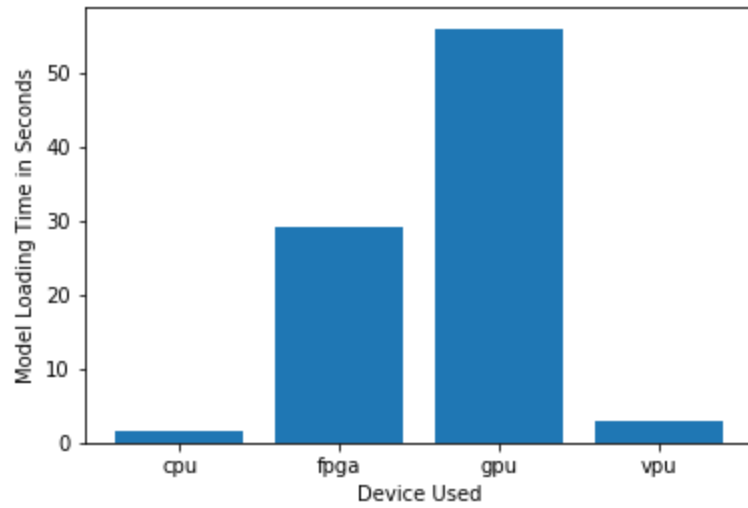| Which hardware might be most appropriate for this scenario?
(CPU / IGPU / VPU / FPGA) |
|---|
| *I listed down the following requirements -*
- *30/35 FPS*
- *5 frame per second expected*
- *Wanna explore chip flaw issues after this scenario*
- *Lasts for at least 5 - 10 years*

So I think FPGA is suitable as it is able to fit longevity, good frame processing capable and reprogrammable |

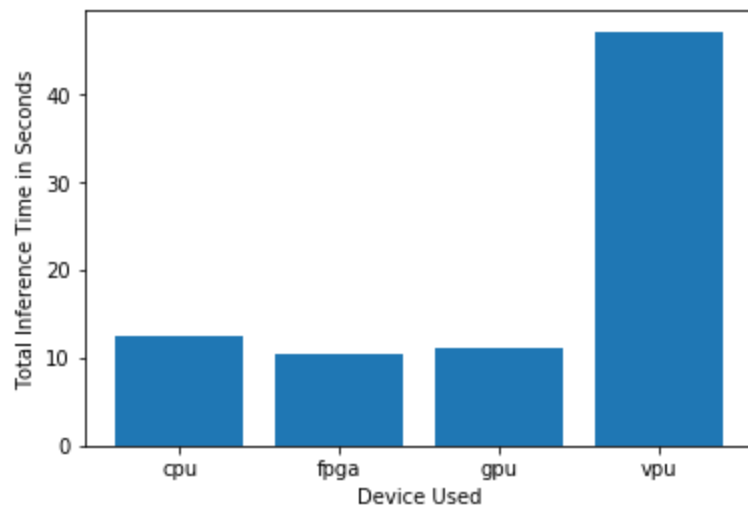| Requirement Observed (Include at least two.)	How does the chosen hardware meet this requirement?
Example requirement: The client requires a tiny device to be connected to their CPU—and their budget is only about $100 for each device.	*Example explanation:* VPU or NCS2 is only about 27.40 mm in size and would fit in the price range.
Client requires more than 5 FPS	*FPGA is capable for that*
Client wants to extend features ahead	*FPGA is reprogrammable*
Client requires longevity of 5-10 years	*FPGA is costly with longevity*

Queue Monitoring Requirements

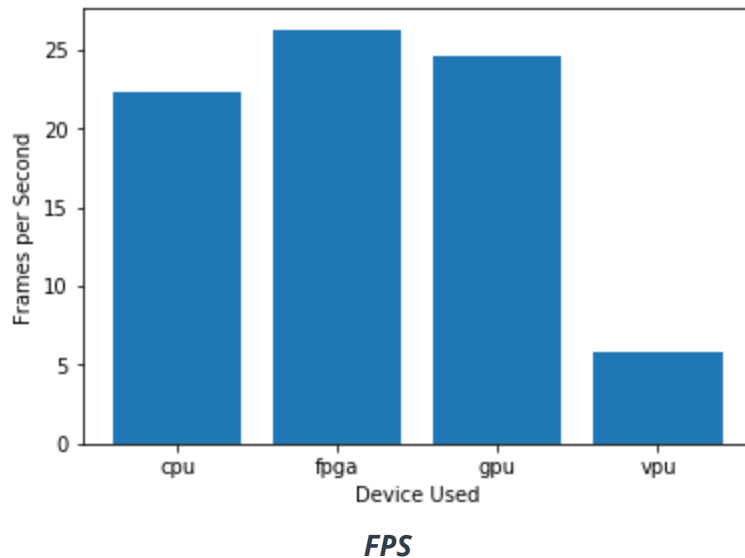| Maximum number of people in the queue	*2*
Model precision chosen (FP32, FP16, or Int8)	*CPU - FP32 and others - FP16*

Test Results

After you've tested your application on all four hardware types (CPU, IGPU, VPU, and FPGA), copy the matplotlib output showing the comparison into the spaces below. You should have three graphs (for model load time, inference time, and FPS).

Model Load Time

Inference Time

FPS

Final Hardware Recommendation

Now synthesize your points from above and provide a brief write-up describing why the chosen hardware is the best choice for this scenario. Be sure to discuss the client's requirements, the test results, and how these relate to one another (e.g., perhaps one of the devices performed better than the rest, but does not meet one of the client's requirements).

Write-up: Final Hardware Recommendation
From the above 3 graphs, I can verify my recommendation FPGA

Scenario 2: Retail

Client Requirements and Potential Hardware Solution

Look through the scenario and find any relevant client requirements. Then, suggest a potential hardware type and explain how this hardware would satisfy each of the requirements.

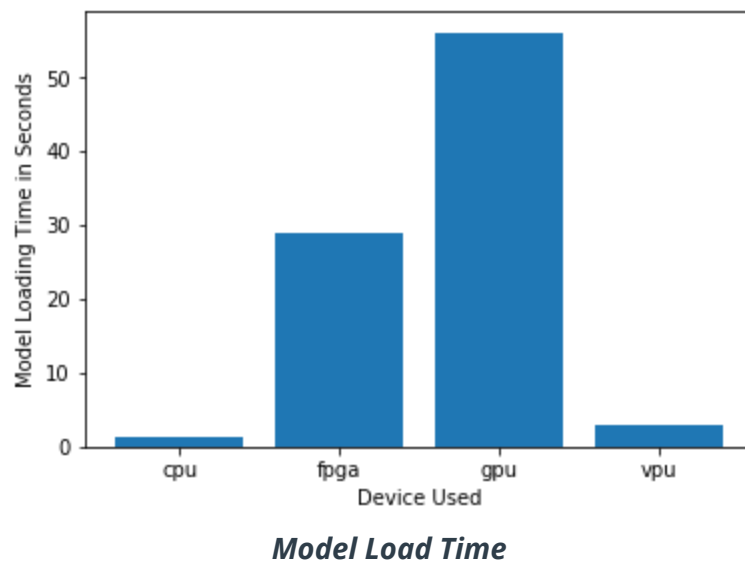| Which hardware might be most appropriate for this scenario?
(CPU / IGPU / VPU / FPGA) |
|---|
| *I listed down the following requirements -*
  -   Already have Intel Core i7 Processor
  -   Doesn't have much money to invest in additional Hardware
  -   Wanna save electric bill

So I think IGPU is suitable as it is just about using existing processor, and saving money on additional hardware and electric bill |

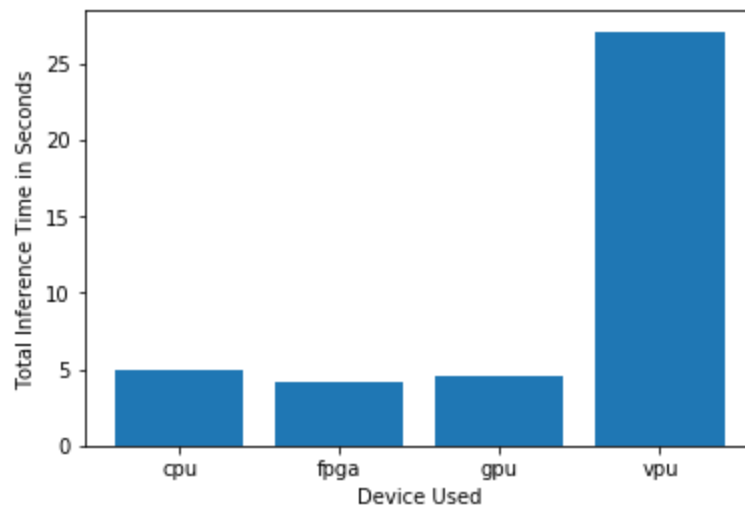| Requirement Observed (Include at least two.)	How does the chosen hardware meet this requirement?
Example requirement: The client requires a tiny device to be connected to their CPU—and their budget is only about $100 for each device.	*Example explanation:* VPU or NCS2 is only about 27.40 mm in size and would fit in the price range.
Client already have Fast processor	*VPU can accelerate the Job beside CPU*
Wanna save money without buying additional hardware	*VPU can support with CPU*
Wanna save money on electric bill	*VPU has very low model loading time*

Queue Monitoring Requirements

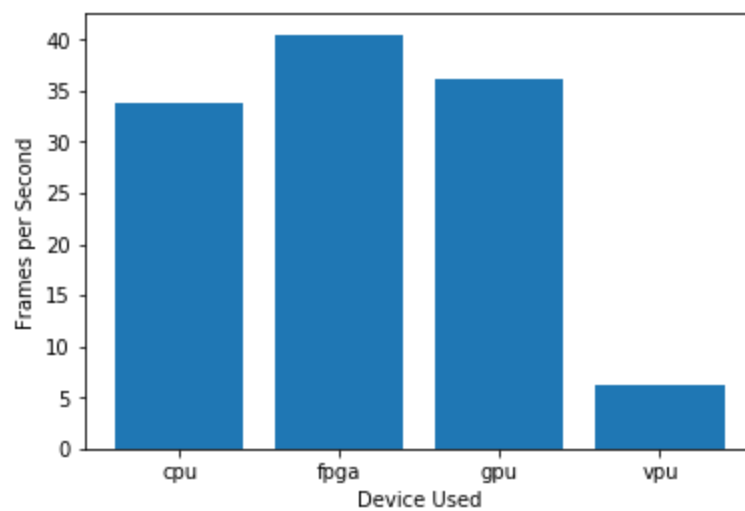| **Maximum number of people in the queue**	The total number of people in the checkout queue ranges from an average of 2 per queue (during normal daily hours) to 5 per queue (during rush hours). So max people is **5**.
Model precision chosen (FP32, FP16, or Int8)	*CPU - FP32 and others - FP16*

Test Results

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Final Hardware Recommendation

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Write-up: Final Hardware Recommendation
FPGAs are expensive and therefore not an option. VPUs might be feasible, but would incur additional cost. Based on clients specific requirements we should use an existing processor IGPU.

UDACITY

Scenario 3: Transportation

Client Requirements and Potential Hardware Solution

Look through the scenario and find any relevant client requirements. Then, suggest a potential hardware type and explain how this hardware would satisfy each of the requirements.

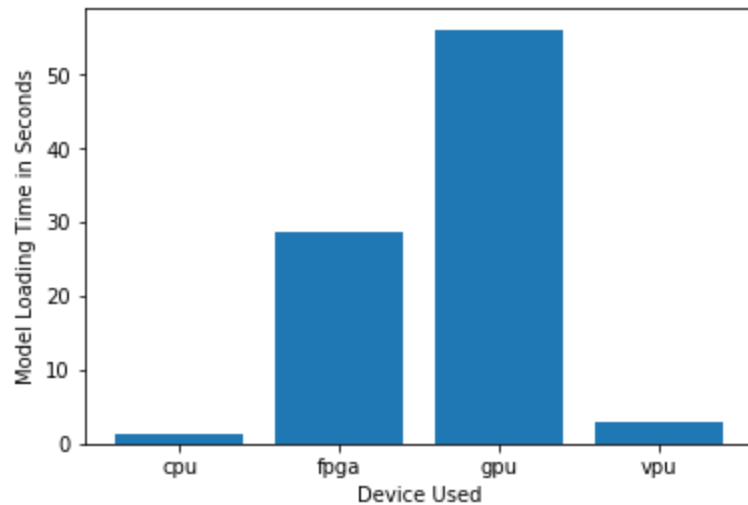| Which hardware might be most appropriate for this scenario?
(CPU / IGPU / VPU / FPGA) |
|---|
| *I listed down the following requirements -*
    -   *All in one PC*
    -   *No significant additional processing power is available*
    -   *Max $300 per machine cost applicable*
    -   *Even wants to save money*

So I think VPU is suitable as it is able to fit existing PC, low power compatibility, and save money on additional hardware |

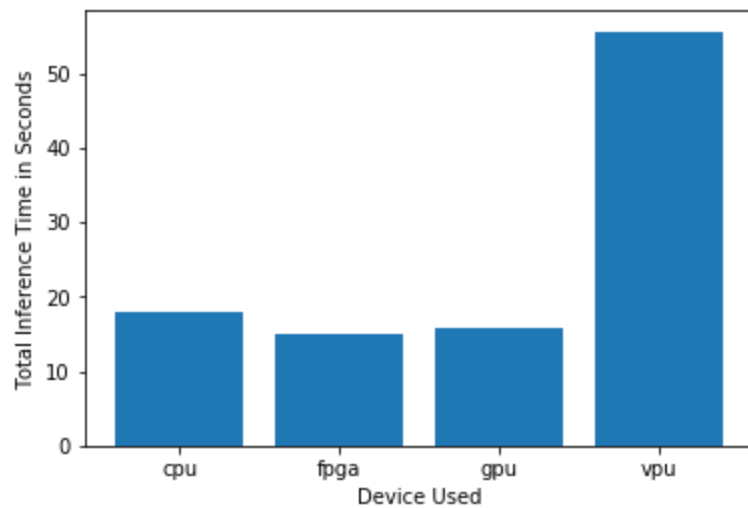| Requirement Observed (Include at least two.)	How does the chosen hardware meet this requirement?
Example requirement: The client requires a tiny device to be connected to their CPU—and their budget is only about $100 for each device.	*Example explanation:* VPU or NCS2 is only about 27.40 mm in size and would fit in the price range.
Already has All in One PC	*VPU can accelerate existing device*
Power consumption constraint	*Intel NCS2 consume around ~ 1W*
Budget Constraint	*Intel NCS2 costs $70 - $100*

Queue Monitoring Requirements

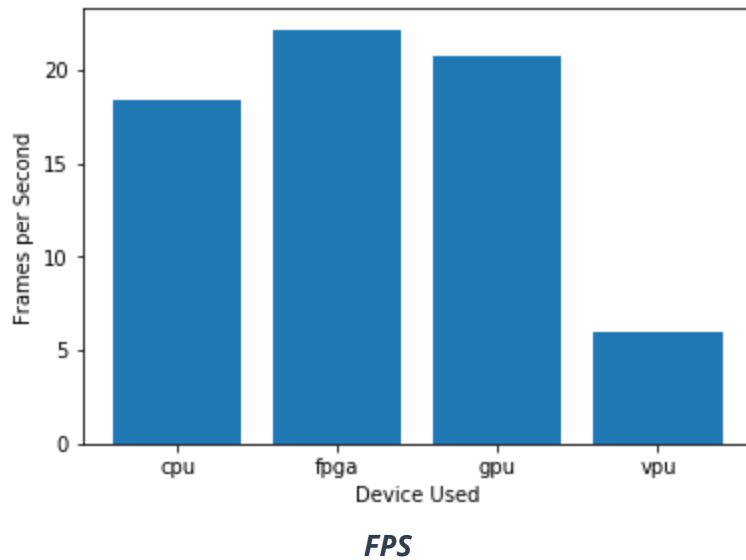| Maximum number of people in the queue	In peak hours they currently have over 15 people on average in a single queue outside every door in the Metro Rail. But during non-peak hours, the number of people reduces to 7 people in a single queue. On office hours there is a train every 2 mins. However, on the weekends the time increases to up to 5 mins since some of their drivers work only 5 days a week. So max people is **15.**
Model precision chosen (FP32, FP16, or Int8)	*CPU - FP32 and others - FP16*

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Final Hardware Recommendation

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Write-up: Final Hardware Recommendation
Based on above tests I can verify my hypothesis with VPU