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.

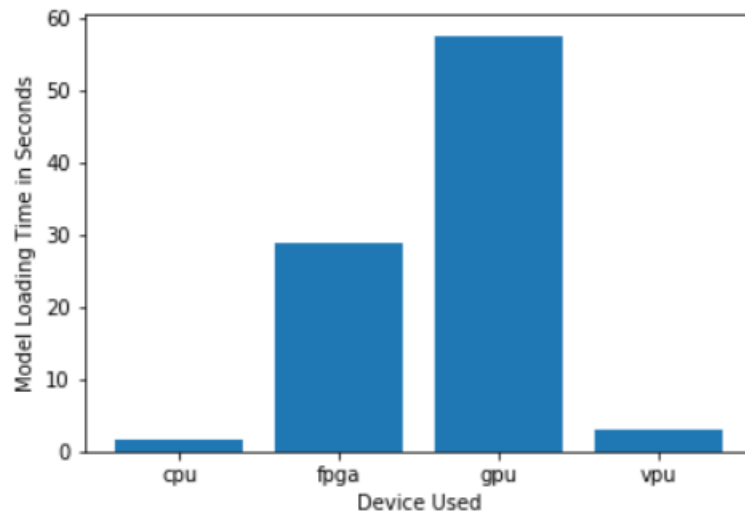| Which hardware might be most appropriate for this scenario? (CPU / IGPU / VPU / FPGA) |
| --- |
| *FPGA* |

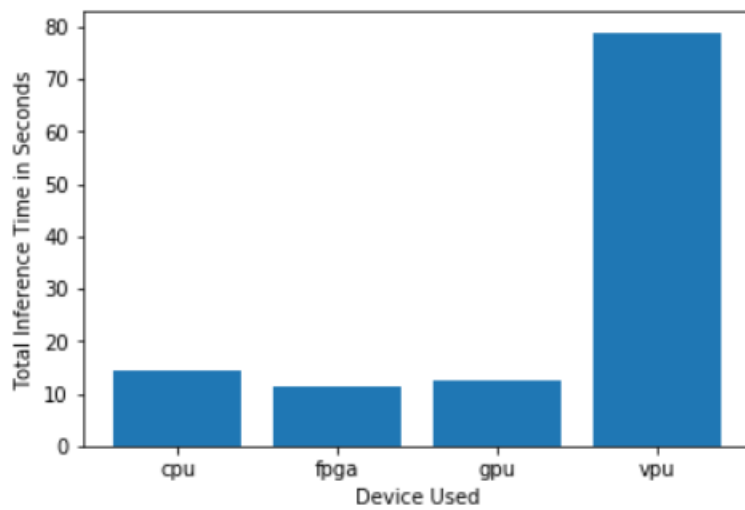| Requirement Observed (Include at least two.)	How does the chosen hardware meet this requirement?
Example requirement: The client requires a tiny device to be connected to their CPU—and their budget is only about $100 for each device.	*Example explanation:* VPU or NCS2 is only about 27.40 mm in size and would fit in the price range.
The client needs a flexible solution	*FPGA is reprogrammable*
No clear budget constrain	*The expensive FPGA is not an issue*
[TODO: Type your answer here]	*[TODO: Type your answer here]*

Queue Monitoring Requirements

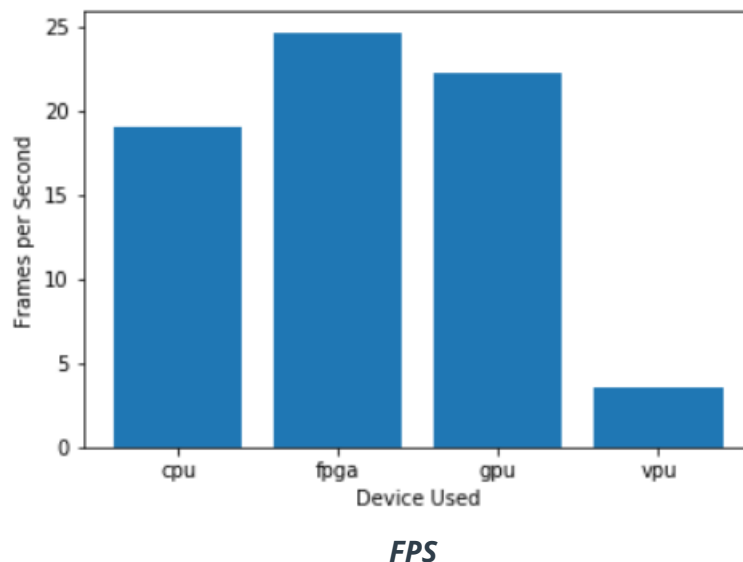| Maximum number of people in the queue	*5 (from video)*
Model precision chosen (FP32, FP16, or Int8)	*FP16*

Test Results

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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
As per the graphs we can first of all exclude the vpu from the choice. It not recommended based on its features, nor is its overall performance. *WE could also exclude the gpu since due to its model load time.* *Although the CPU seems the best option, I would still go with the FPGA due to the flexibility it provides for the application.* *Conclusion: FPGA would be the recommended hardware*

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.

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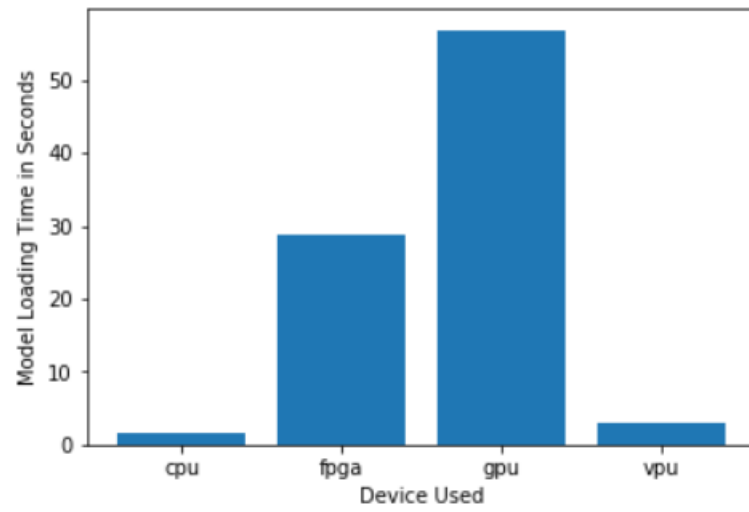| Which hardware might be most appropriate for this scenario? (CPU / IGPU / VPU / FPGA) |
|---|
| *VPU* |

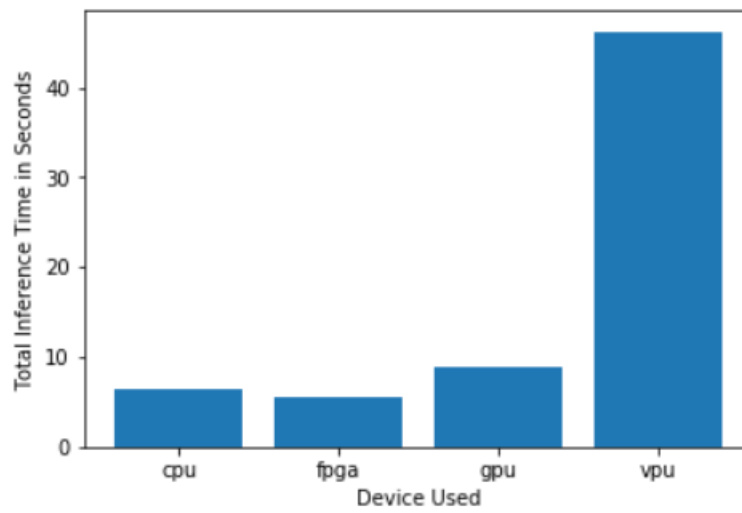| Requirement Observed (Include at least two.)	How does the chosen hardware meet this requirement?
Example requirement: The client requires a tiny device to be connected to their CPU—and their budget is only about $100 for each device.	*Example explanation:* VPU or NCS2 is only about 27.40 mm in size and would fit in the price range.
Budget constrain	*VPU's are cheaper than other alternatives*
Low power consumption	*VPU does not use too much power*
[TODO: Type your answer here]	*[TODO: Type your answer here]*

Queue Monitoring Requirements

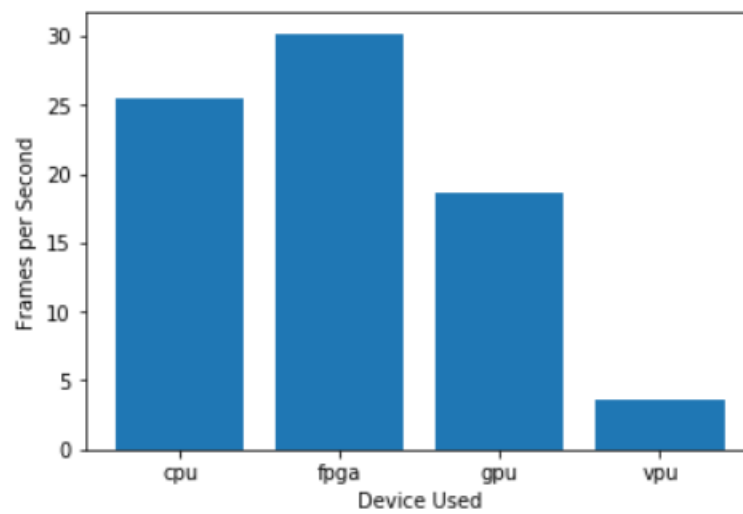| Maximum number of people in the queue	*5 during rush hours => target 4 to improve*
Model precision chosen (FP32, FP16, or Int8)	*FP32 (FP16)*

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

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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
GPU and FPGA will be excluded due to price and model load timing.   *In this example it is quite clear that the CPU outperforms the VPU in all variables.*   *But even with the relatively large inference time for the VPU, the customer's price constrain has to be put into the choice criteria.*   *Overall, the application itself is not highly time sensitive and thus a simple VPU that does not require and excessive power should do the trick*   *Conclusion: VPU would be the recommended hardware*

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)
CPUs (available on the PC)

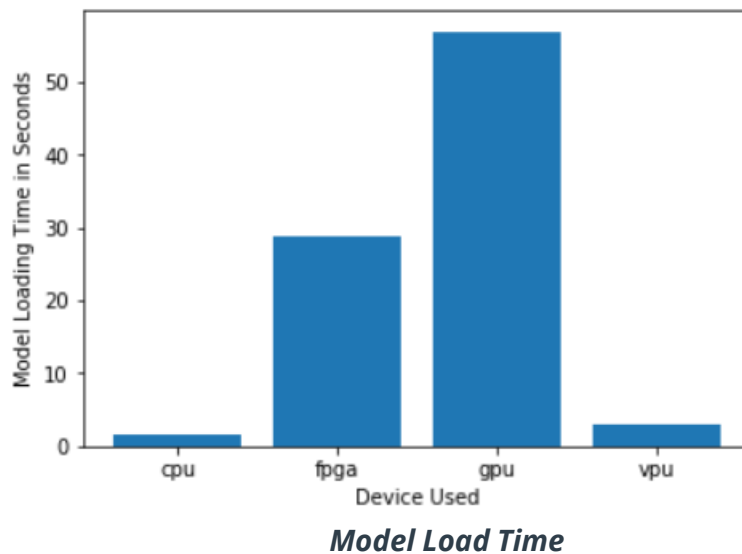| Requirement Observed (Include at least two.)	How does the chosen hardware meet this requirement?
Example requirement: The client requires a tiny device to be connected to their CPU—and their budget is only about $100 for each device.	*Example explanation:* VPU or NCS2 is only about 27.40 mm in size and would fit in the price range.

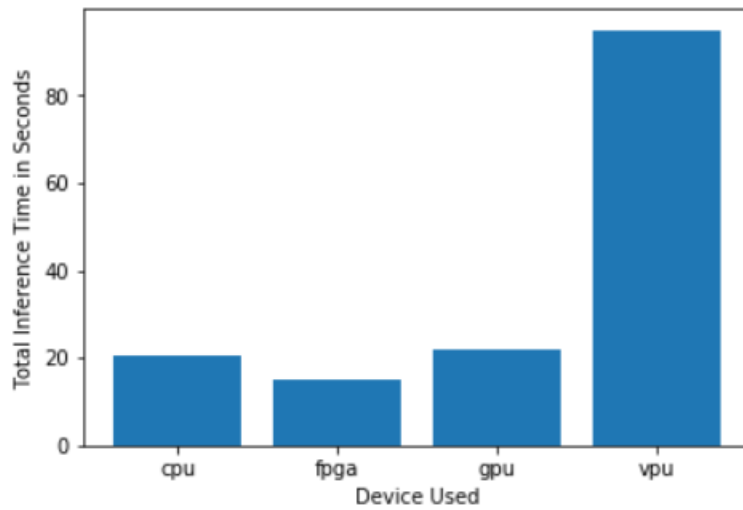| ALL-in-one PC solution	The CPU on the PC can handle the inference
Budget	Using the available CPU should do the trick. No additional Hardware needed
Power	Power consumption won't drastically change

Queue Monitoring Requirements

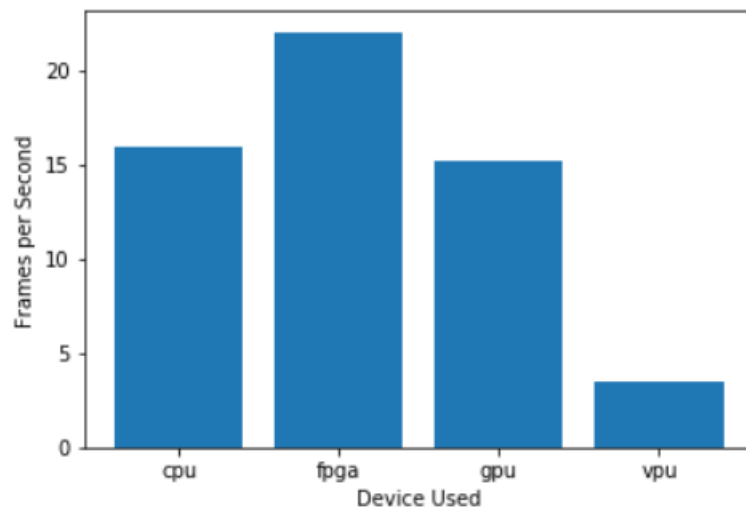| Maximum number of people in the queue	15 during rush hour => => target 12 to improve
Model precision chosen (FP32, FP16, or Int8)	FP32 (FP16)

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
FPGA and FPGA will be excluded due to model load timing.   *VPU will b e excluded due to high inference time.*

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In this example it is quite clear that the CPU outperforms all other alternatives.
Since there is no clear budget constrain and the available infrastructure, with the all-in one PC solution, the CPU would be the best available solution.
The next step in this example is to consider choosing the appropriate CPU to account for additional future applications.

Conclusion: CPU would be the recommended hardware