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.

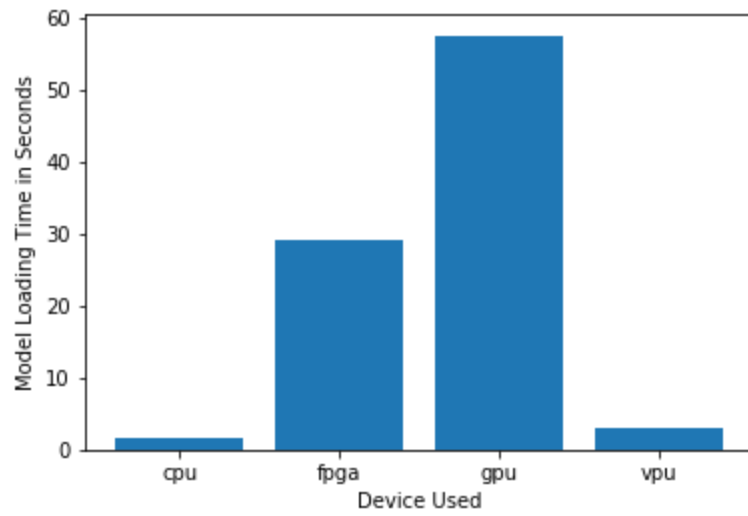| Which hardware might be most appropriate for this scenario? (CPU / IGPU / VPU / FPGA) |
|---|
| *FPGA* |

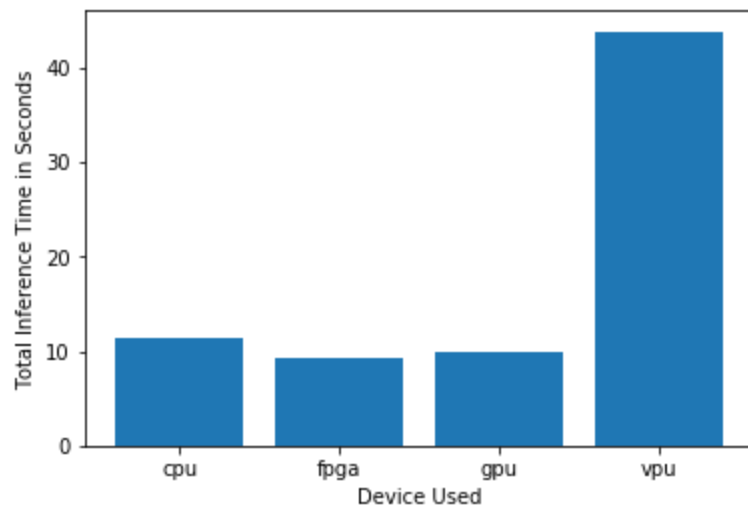| Requirement Observed (Include at least two.)	How does the chosen hardware meet this requirement?
The client requires to detect chip flaws with varying design which has to be reprogrammed quickly to detect chip flaws	FPGA provides greater flexibility/reprogrammability to include new chip design
The client would like to complete the image processing tasks five times per second	FPGAs are designed provide low latency with high performance
The client is looking for a system to last at least for 5-10 years	FPGAs are designed to have 100% on-time performance and have a long life span

Queue Monitoring Requirements

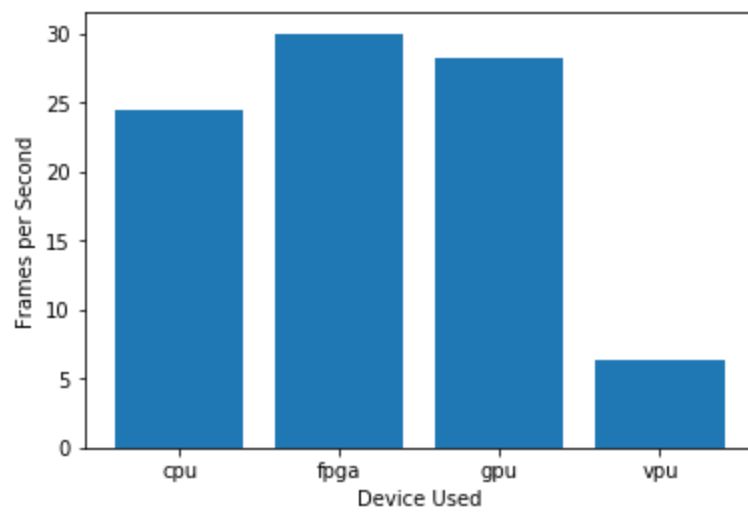| Maximum number of people in the queue	5 (based on the scenario)
Model precision chosen (FP32, FP16, or Int8)	FP16

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).

UDACITY

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
Recommended Hardware - FPGA : IEI Mustang-F100-A10 Based on the test results with different hardwares, FPGA seems to satisfy the client requirements. It is evident from the plot that FPGAs have a shortened inference time and it can process more frames per second. Apart from this FPGAs provide higher life span and can be reprogrammed providing flexibility seens as a major client requirement.

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.

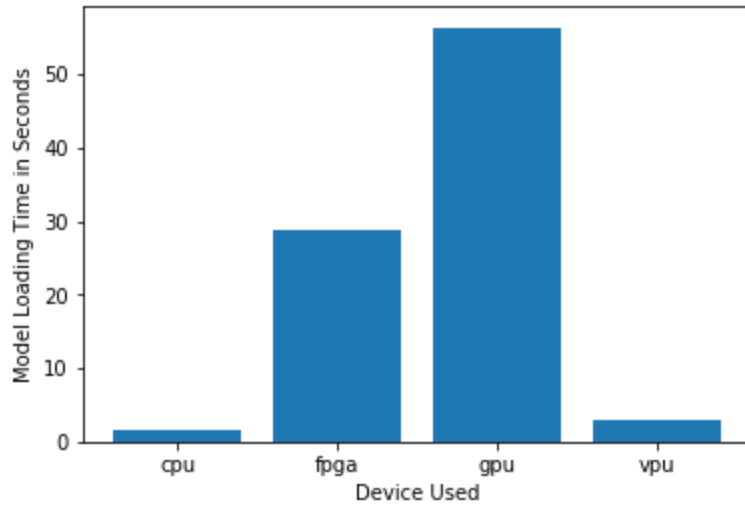| Which hardware might be most appropriate for this scenario?
(CPU / IGPU / VPU / FPGA) |
|---|
| _CPU_ |

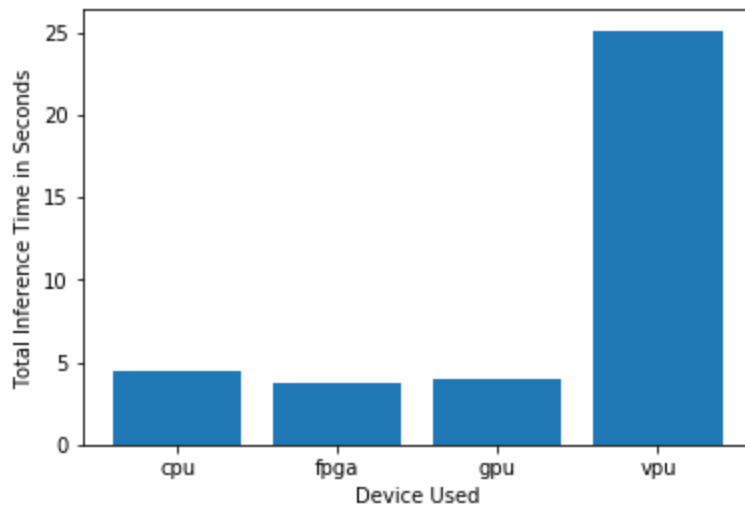| Requirement Observed (Include at least two.)	How does the chosen hardware meet this requirement?
The client does not have much money to invest in additional hardware	The existing counter system is equipped with advanced Intel i7 core processor
The client requires to save cost on additional electricity bills	The existing Intel i7 core processor consumes TDP of acceptable value
The client requires to have normal inference/video processing time requirements	The existing Intel i7 core processor can be used to solve the image processing tasks

Queue Monitoring Requirements

Maximum number of people in the queue	2 (based on the scenario requirement)

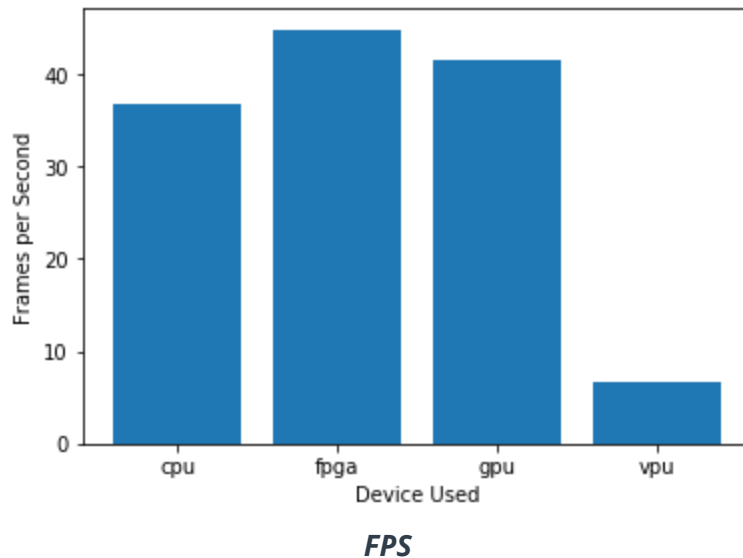| Model precision chosen (FP32, FP16, or Int8)	FP16

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
Recommended Hardware - CPU Based on the test results with different hardwares, the CPU device seems to satisfy the client requirements. The client will get the required throughput with the existing Intel i7 core processor as it provides better inference time and model load time when compared with Image accelerators like Nc2 thereby saving additional costs.

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)
VPU

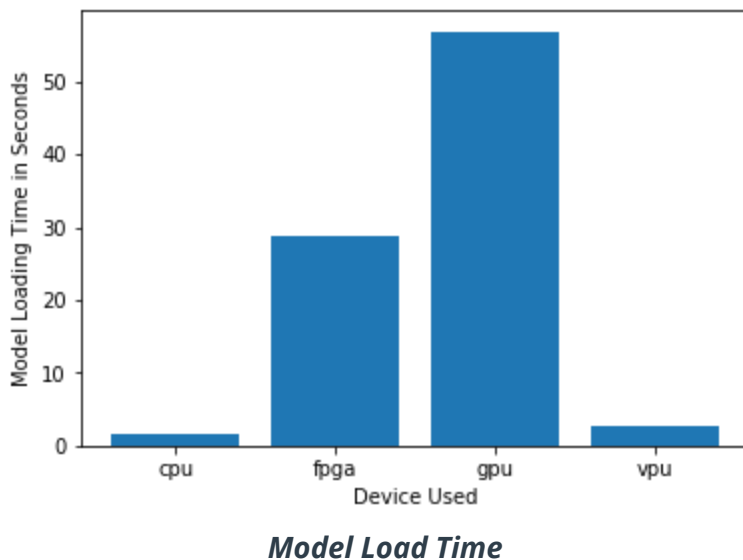| Requirement Observed	How does the chosen hardware meet this

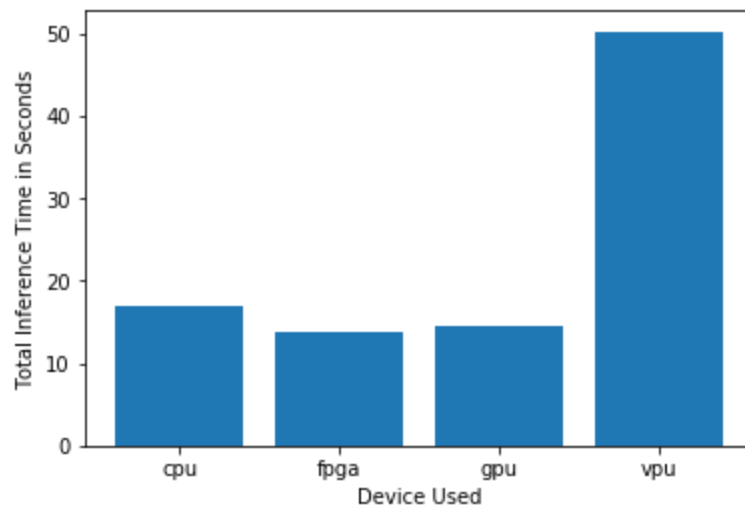| (Include at least two.)	requirement?
The client does not have much money to invest in additional hardware	VPU or NCS2 will fit in the price range mentioned by the client.
The client would like to save on future power requirements	VPU doesn't have additional power requirements
The client All-In-One PCs does not have processing power for additional inference tasks/image processing tasks	VPU will perfectly fit here as imaging accelerators

Queue Monitoring Requirements

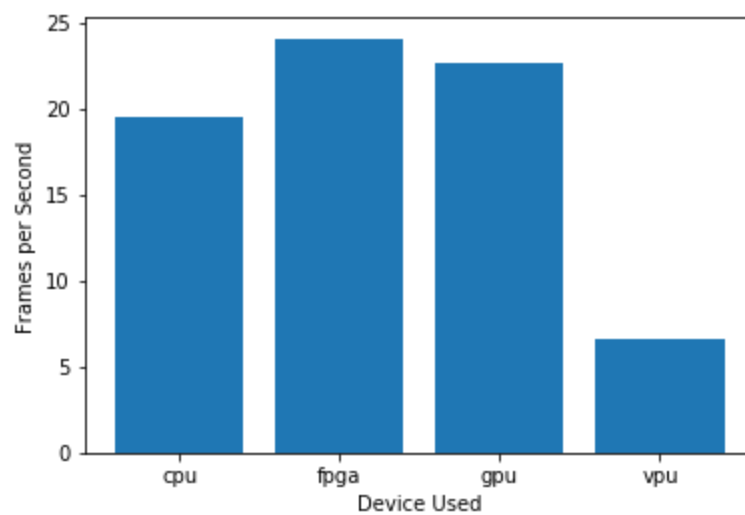|	
Maximum number of people in the queue	7 (based on the scenario requirement)
Model precision chosen (FP32, FP16, or Int8)	FP16

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
Recommended Hardware - VPU : Intel NC2 Based on the test results with different hardwares, the VPU device will satisfy the client's main requirement. Even though the other hardware yielded better results, one of the client requirements seems to be the money to buy additional hardware. Therefore with image accelerators like Intel NC2 the client can offload inference tasks to VPU. Also, the client existing processing in the All-In-One PCs can be continued and inference can be performed using VPU.