

Choose the Right Hardware

Final Proposal

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

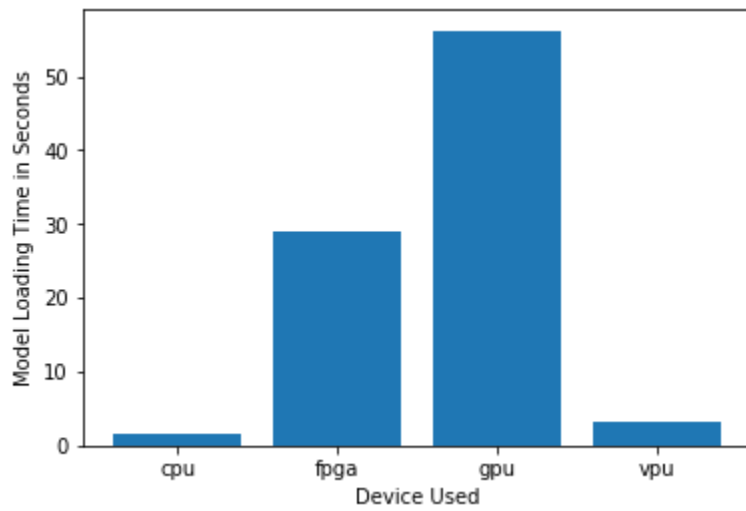
Requirement Observed (Include at least two.)	How does the chosen hardware meet this requirement?
The client requires 30-35 FPS which process 5 images per second.	FPGA offers better speed compared to other devices, which meets this requirement.
It should be re-programmable & optimizable for a new design.	FPGA allows re-programmability and optimization in the future even after installation.
Good quality which is durable for 5 to 10 years.	FPGA has good quality and durability
There is no restriction in cost as their revenue is good.	FPGA is expensive than other devices, but it is not an issue here.

Queue Monitoring Requirements

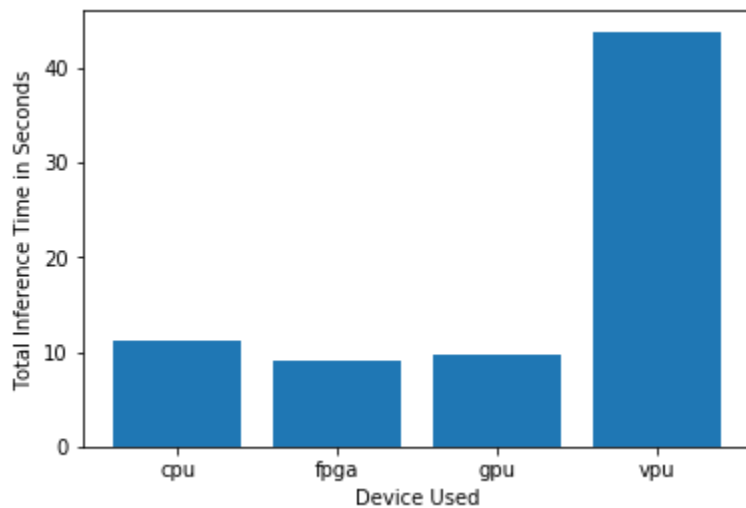
Maximum number of people in the queue	5
Model precision chosen (FP32, FP16, or Int8)	FP16

Test Results

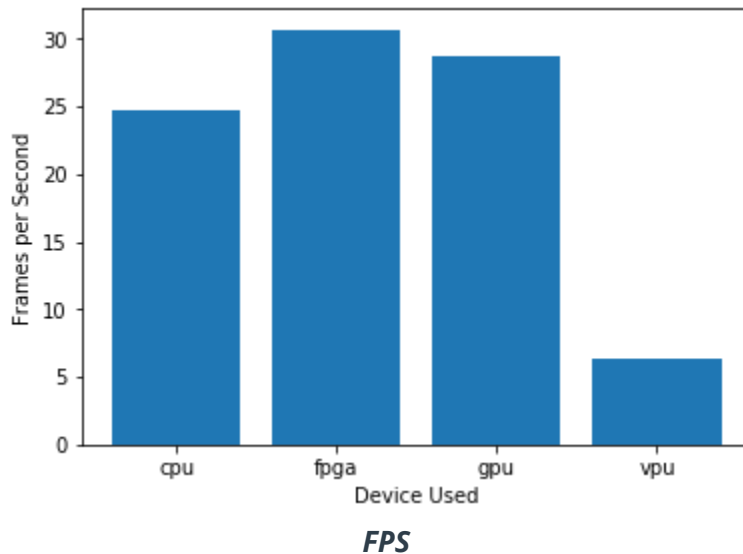
After you've tested your application on all four hardware types (CPU, IGPU, VPU, and FPGA), copy the matplotlib output showing the comparison into the spaces below. You should have three graphs (for model load time, inference time, and FPS).



Model Load Time



Inference Time



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 noted in the above table, FPGA has shown the best result in performance. It meets the client's 30-35 FPS requirement and is faster than other devices in loading the model and inference time as well. So **FPGA** is still the best choice for this scenario.*

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)

IGPU

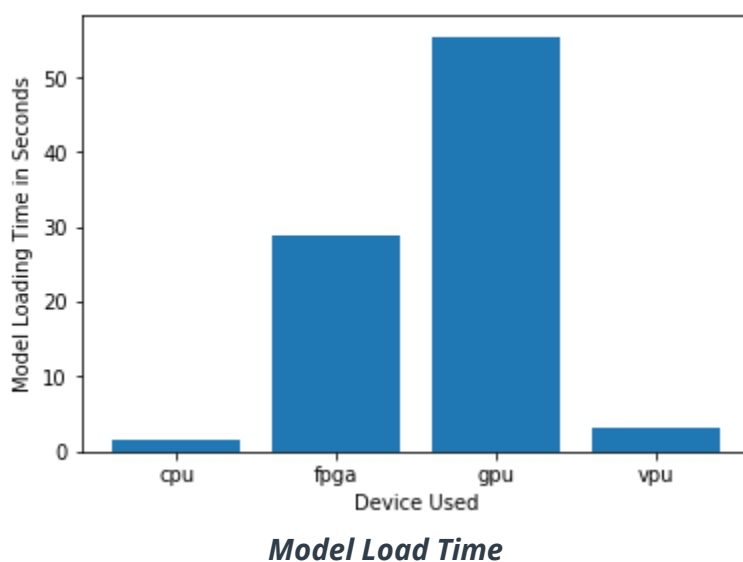
Requirement Observed (Include at least two.)	How does the chosen hardware meet this requirement?
The client does not have much money to invest in additional hardware	Making use of the IGPU reduces the investment in additional hardware.
To save as much as possible on his electric bill	With the advantage of IGPU's configurable power consumption, electric bill could be saved.

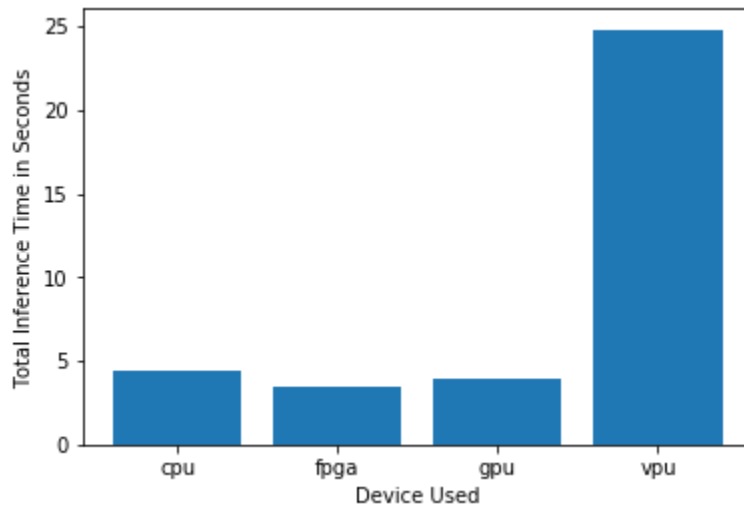
Queue Monitoring Requirements

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

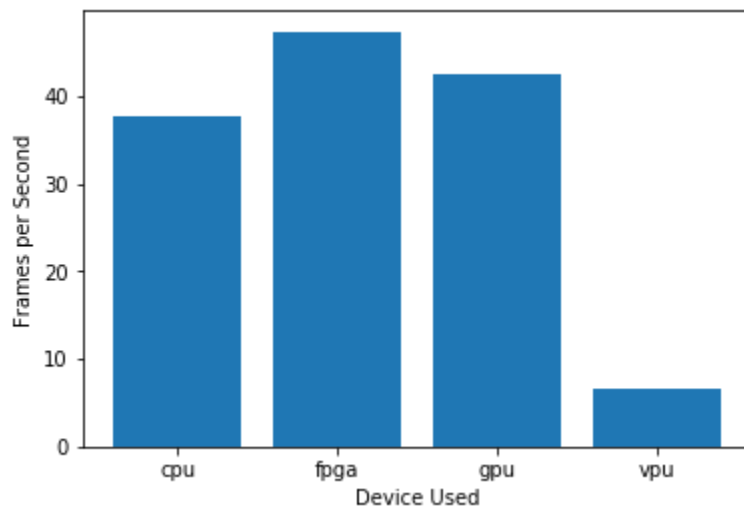
Test Results

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).





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 we can see even though the model loading time is comparatively more than other devices, it happens only once during startup time. After that, the inference and fps are better and meets the clients requirement with their estimated price range. So **IGPU** is the best choice for this scenario.*

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

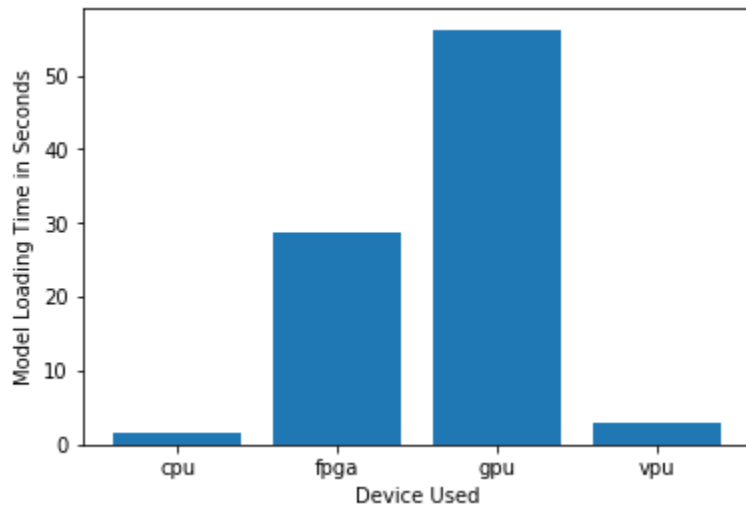
Requirement Observed (Include at least two.)	How does the chosen hardware meet this requirement?
The client budget allows for a maximum of \$300 per machine	VPU is only around \$100 and would fit in the price range.
To save as much as possible both on hardware and future power requirements	Since VPU is typically an USB or similar smaller attachment device, power consumption is comparatively lesser than the other devices.

Queue Monitoring Requirements

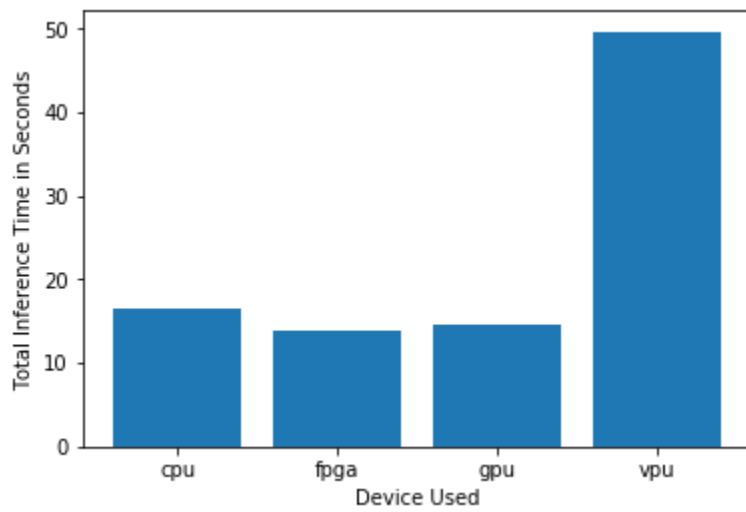
Maximum number of people in the queue	15
Model precision chosen (FP32, FP16, or Int8)	FP16

Test Results

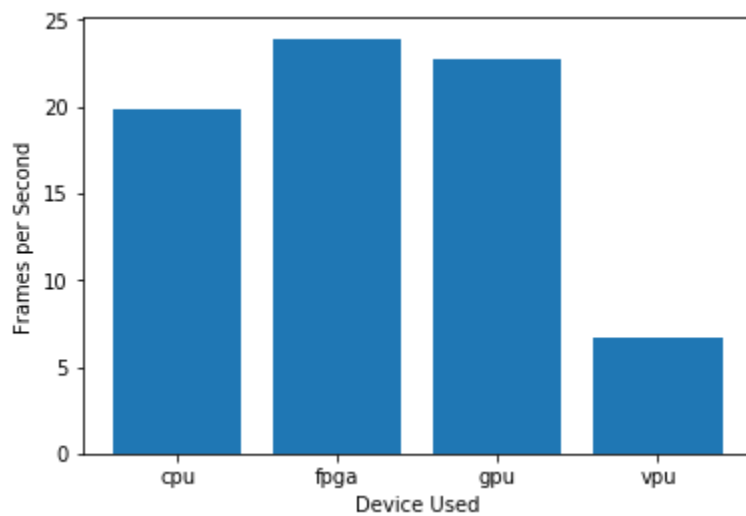
After you've tested your application on all four hardware types (CPU, IGPU, VPU, and FPGA), copy the matplotlib output showing the comparison into the spaces below. You should have three graphs (for model load time, inference time, and FPS).



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

*Even though the inference time and fps are comparatively lesser than other devices. It will still be able to meet the requirement of the client to handle 7 to 15 people in queue without spending much on the new hardware for each computer. So **VPU** is the best choice for this scenario.*