Choosing the Right Hardware

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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.

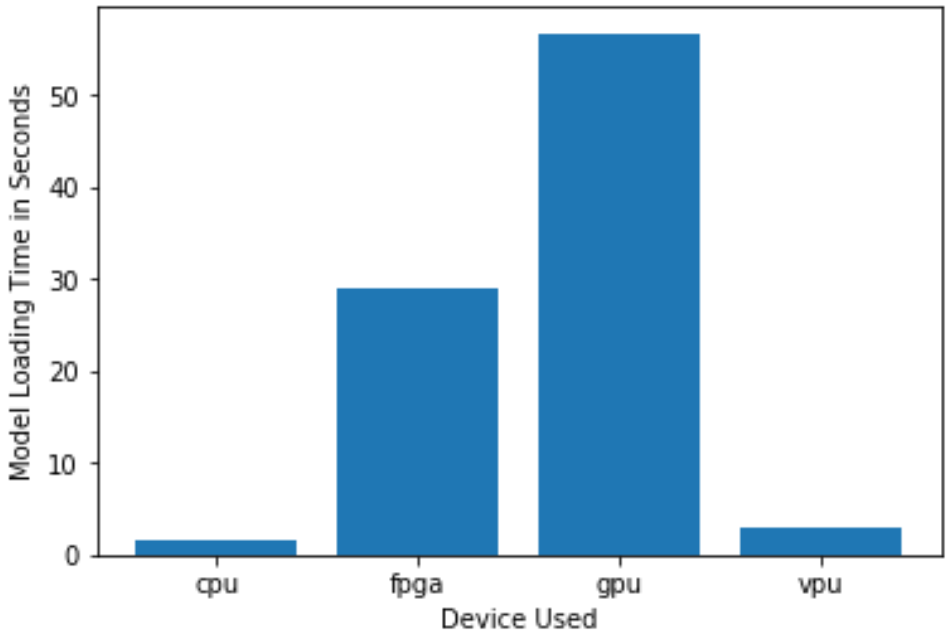
Which hardware might be most appropriate for this scenario? (CPU / IGPU / VPU / FPGA)
FPGA

Requirement Observed (Include at least two.)	**How does the chosen hardware meet this requirement?**
The client requires a reprogrammable device for further use in his industry	FPGAs are reprogrammable so it matched the clients needs.
The client requires the system to run for 5-10years	FPGAs are robust and can run for 10years
Client has plenty of revenue to install a quality system	FPGAs are expensive but client agrees with the price so concluding that FPGAs are of best match.

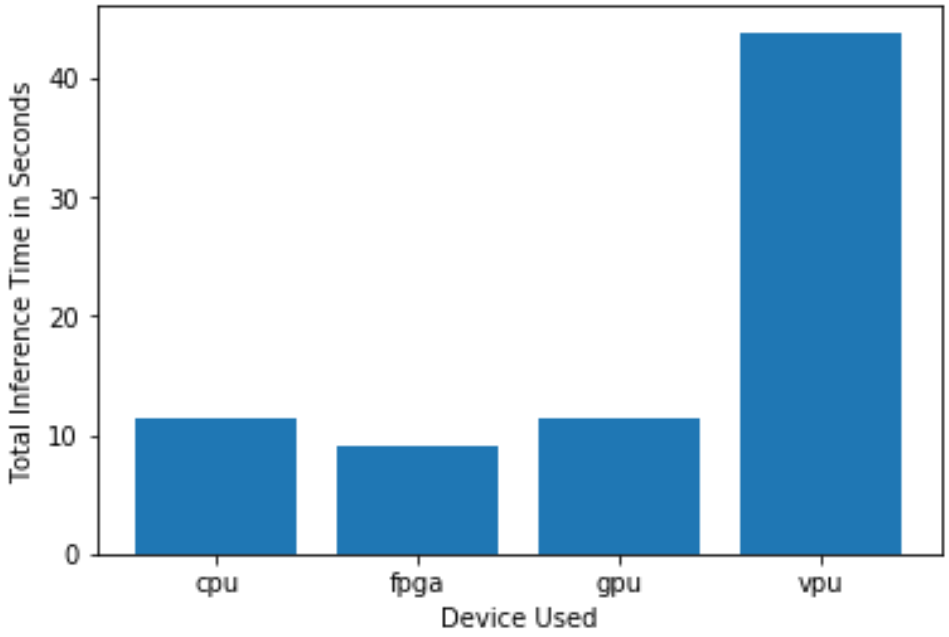
Queue Monitoring Requirements

Maximum number of people in the queue	2
Model precision chosen (FP32, FP16, or Int8)	FPGAs support FP16 model precision

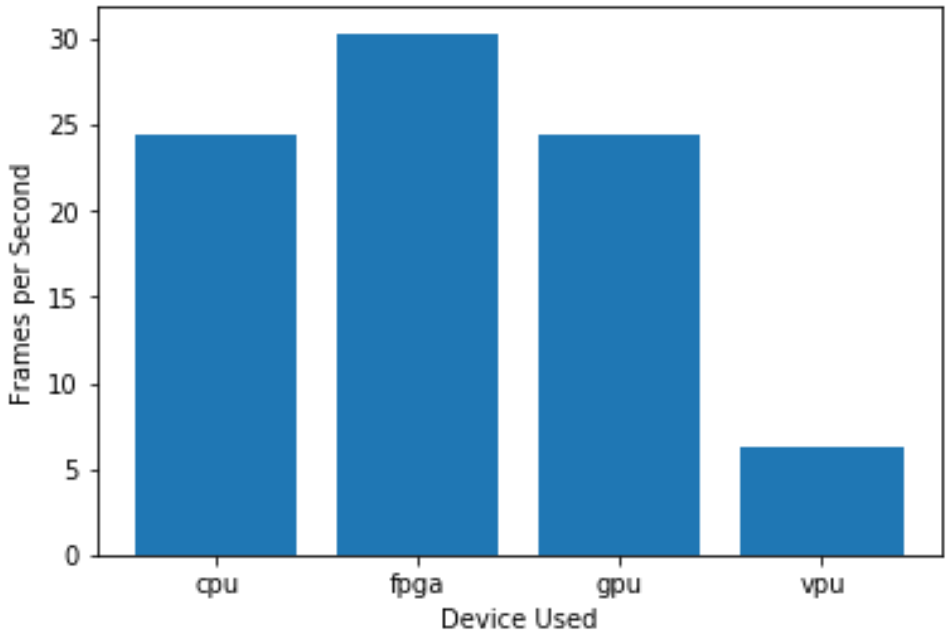
Test Results



Model Load Time



Inference Time



FPS

Final Hardware Recommendation

Write-up: Final Hardware Recommendation
FPGA performed better than other hardware since inference was performed only on a single image. The system had higher FPS and was able to detect all the people in the frame correctly. Since it has met all the clients requirements I would like to conclude that final hardware recommendation is 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.

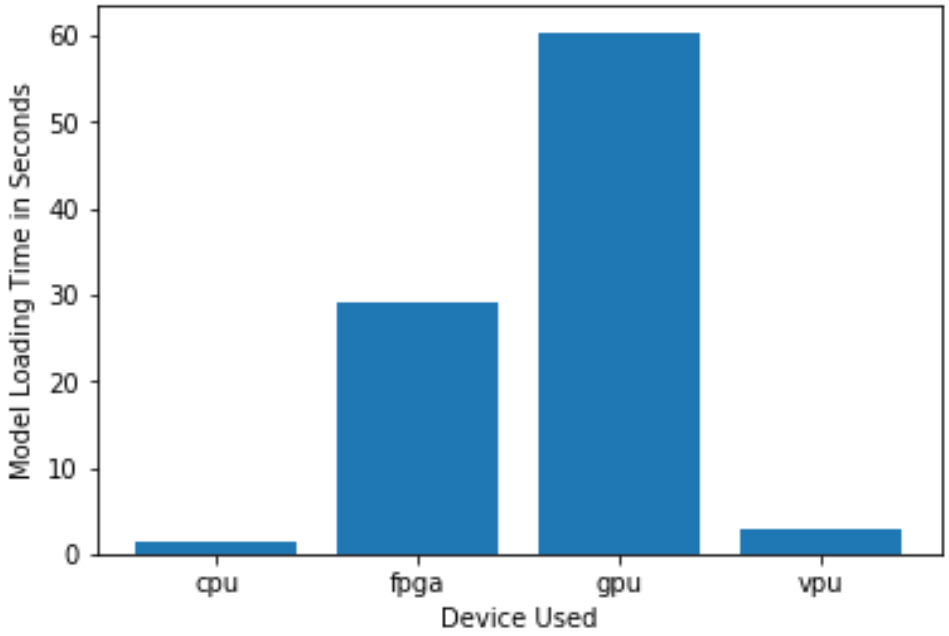
Which hardware might be most appropriate for this scenario? (CPU / IGPU / VPU / FPGA)
CPU

Requirement Observed (Include at least two.)	How does the chosen hardware meet this requirement?
The client requires a system low of cost.	CPU can be utilized since client already posses Intel i7 core processor and minimal tasks are only performed on it.
The client does not want the system to run 24/7	Therefore CPU is the best choice.

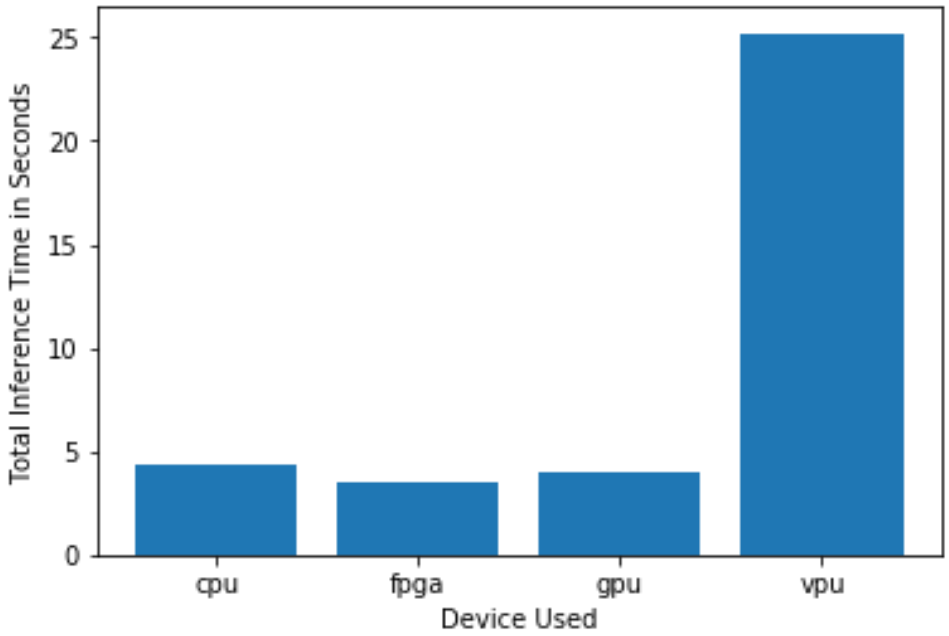
Queue Monitoring Requirements

Maximum number of people in the queue	2
Model precision chosen (FP32, FP16, or Int8)	FP32

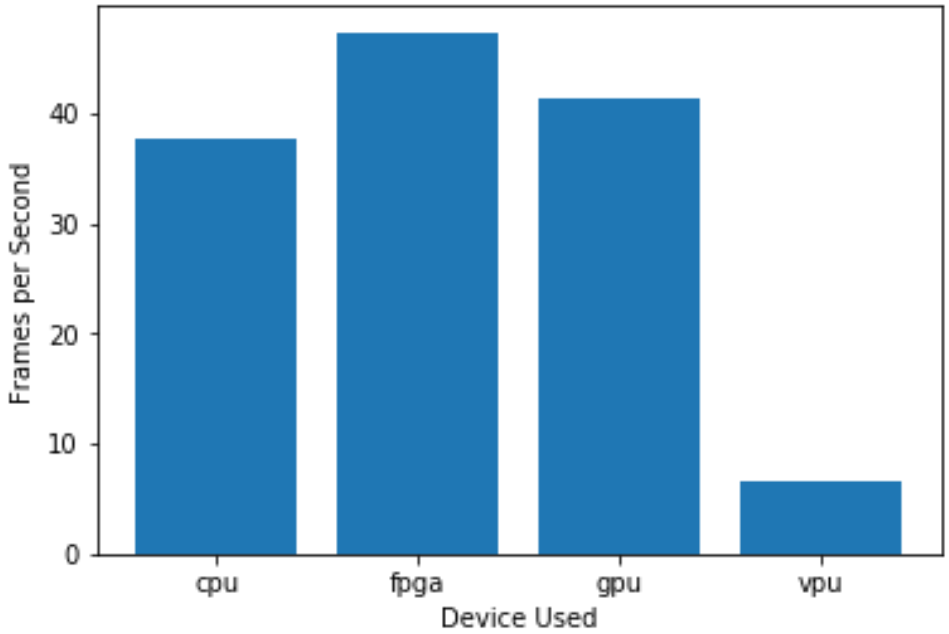
Test Results



Model Load Time



Inference Time



FPS

Final Hardware Recommendation

Write-up: Final Hardware Recommendation
The client does not want to spend any additional money on system. He already has a CPu which is capable of running the inference. Perhaps FPGA performed better than the rest, but does not meet one of the client's requirements.

Scenario 3: Transportation

Client Requirements and Potential Hardware Solution

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

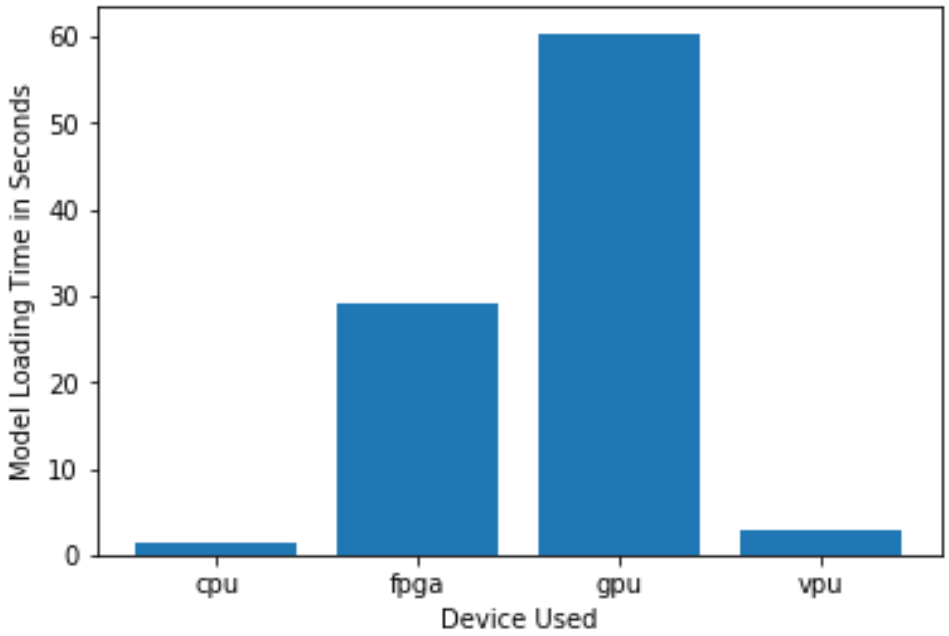
Requirement Observed (Include at least two.)	How does the chosen hardware meet this requirement?
Client requires a system with $300 budget per machine	CPU/IGPU are available for this price range.
Client requires 7 cameras to be processed at a time	CPU can perform Multiprocessing to perform inference on several frames at a time.

Queue Monitoring Requirements

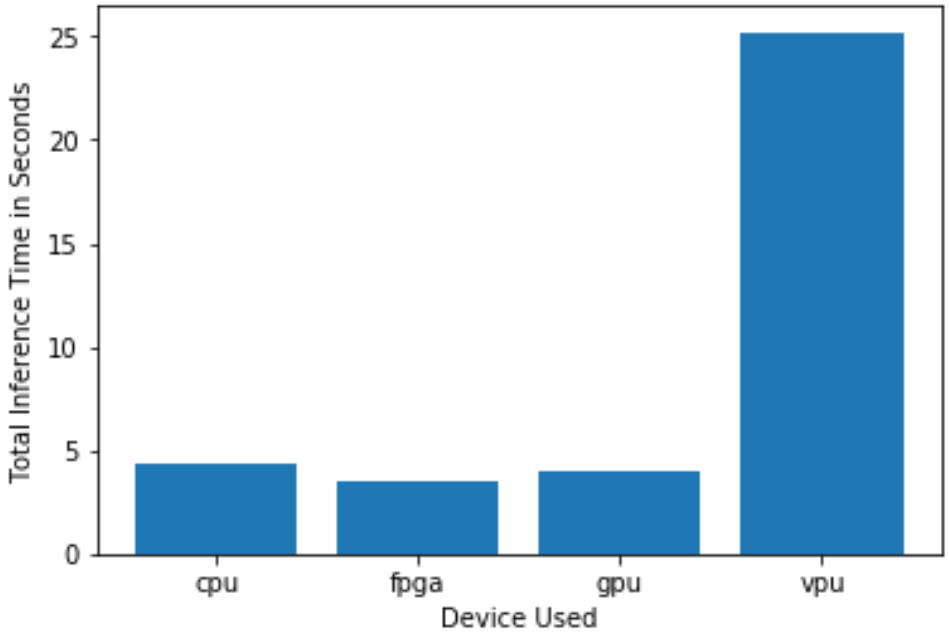
Maximum number of people in the queue	7
Model precision chosen (FP32, FP16, or Int8)	CPU can handle FP32 precision

Test Results

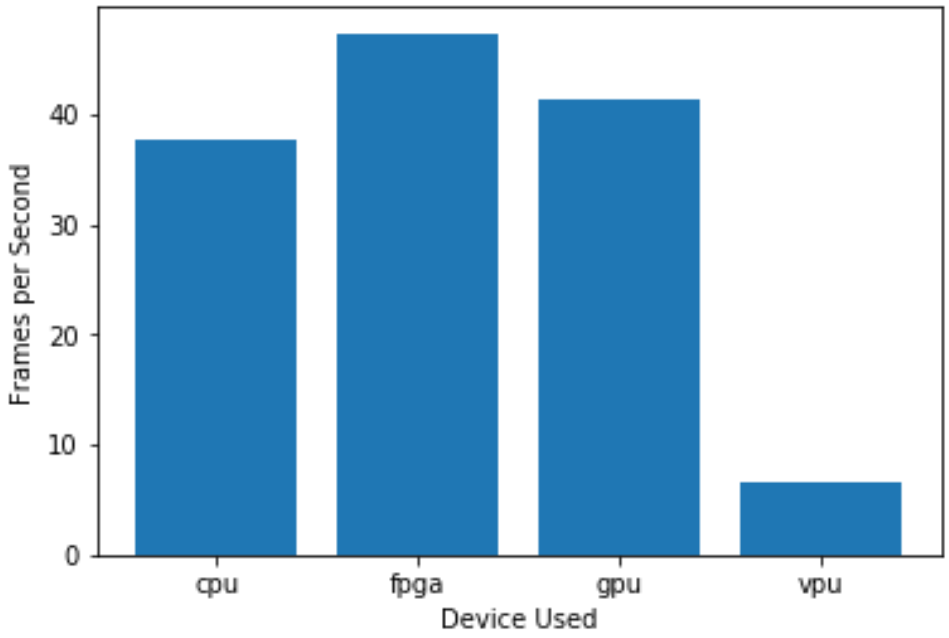
After you've tested your application on all four hardware types (CPU, IGPU, VPU, and FPGA), copy the matplotlib output showing the comparison into the spaces below. You should have three graphs (for model load time, inference time, and FPS).



Model Load Time



Inference Time



FPS

Final Hardware Recommendation

Write-up: Final Hardware Recommendation
The client required 7 cameras to run simultaneously in one PC. FPGAs can also do the similar task, but the cost of it is high. Therefore CPUs are the best option for this client.