Computer Vision on Different CPU Architectures

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Project Overview Objective: Compare performance of object detection on Pi 4 (RISC) vs Pi 5 (CISC). Same RAM, camera, and OS to ensure fair testing.

Testing Methodology Tools: Geekbench, facial recognition model with OpenCV on Raspberry Pi camera.
Metrics: CPU temperature, clock speed, and FPS performance.

Benchmark Results:

Object Detection (SC/MC): Pi 4: 2.77 / 7.99 | Pi 5: 20.6 / 34.3
Photo Library (SC/MC): Pi 4: 3.32 / 10.5 | Pi 5: 11.9 / 30.5
Background Blur (SC/MC): Pi 4: 0.75 / 0.78 | Pi 5: 3.45 / 9.93

Live Facial Recognition Test:

FPS (no face): Pi 4: 6.07 | Pi 5: 7.76
FPS (4 faces): Pi 4: 0.47 | Pi 5: 2.36
CPU Max Usage: Pi 4: 84.6% @ 1800MHz | Pi 5: 55.5% @ 2400MHz

Analysis and Conclusion: Pi 5 delivered significantly better FPS and lower temperature delta. It experienced less lag during high-load facial detection. Pi 5's CISC architecture offers major improvements in computer vision tasks. Higher price is justified by better performance and reliability.