Computer for AI Egde Computing

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| **Embedded Computer** | **AI Performence** | **Features** | **Price** |
| **Jetson Orin Nano Developer Kit** | Very High | Amazon.com: NVIDIA Jetson Orin Nano Developer Kit : Electronics  - GPU: **024-core NVIDIA Ampere architecture GPU with 32 Tensor Cores**  - CPU: **6-core Arm® Cortex®-A78AE v8.2 64-bit CPU 1.5MB L2 + 4MB L3**  - Memory: 8 GB 128-bit LPDDR4x @ 68GB/s  - Storage: **SD Card Slot & external NVMe via M.2 Key M**  - Video Encode: 2x 4K @ 30 | 6x 1080p @ 60 | 14x 1080p @ 30 (H.265/H.264)  - Video Decode: 2x 4K @ 60 | 4x 4K @ 30 | 12x 1080p @ 60 | 32x 1080p @ 30 (H.265) 2x 4K @ 30 | 6x 1080p @ 60 | 16x 1080p @ 30 (H.264)  - Camera: 2x MIPI CSI-2 DPHY lanes  - Connectivity: Gigabit Ethernet, M.2 Key E  - Display: HDMI and display port  - USB: 4x USB 3.0, USB 2.0 Micro-B  - Others: GPIO, I2C, I2S, SPI, UART  - Mechanical: 103 mm x 90.5 mm x 34.66 mm | ~16.000.000 vnd |
| **Jetson Xavier NX Developer Kit** | Very High | - GPU: NVIDIA Volta architecture with 384 NVIDIA CUDA® cores and 48 Tensor cores  - CPU: 6-core NVIDIA Carmel ARM®v8.2 64-bit CPU 6 MB L2 + 4 MB L3  - Memory: 8 GB 128-bit LPDDR4x @ 51.2GB/s  - Storage: microSD (not included)  - Video Encode: 2x 4K @ 30 | 6x 1080p @ 60 | 14x 1080p @ 30 (H.265/H.264)  - Video Decode: 2x 4K @ 60 | 4x 4K @ 30 | 12x 1080p @ 60 | 32x 1080p @ 30 (H.265) 2x 4K @ 30 | 6x 1080p @ 60 | 16x 1080p @ 30 (H.264)  - Camera: 2x MIPI CSI-2 DPHY lanes  - Connectivity: Gigabit Ethernet, M.2 Key E  - Display: HDMI and display port  - USB: 4x USB 3.0, USB 2.0 Micro-B  - Others: GPIO, I2C, I2S, SPI, UART  - Mechanical: 103 mm x 90.5 mm x 34.66 mm | ~20.000.000 vnd |
| **Jetson Nano** | High | - GPU:128-core Maxwell  - CPU: Quad-core ARM A57 @ 1.43 GHz  - Memory: 4 GB 64-bit LPDDR4 25.6 GB/s  - Storage: microSD (not included)  - Video Encode: 4K @ 30 | 4x 1080p @ 30 | 9x 720p @ 30 (H.264/H.265)  - Video Decode: 4K @ 60 | 2x 4K @ 30 | 8x 1080p @ 30 | 18x 720p @ 30 (H.264/H.265)  - Camera: 2x MIPI CSI-2 DPHY lanes  - Connectivity: Gigabit Ethernet, M.2 Key E  - Display: HDMI and display port  - USB: 4x USB 3.0, USB 2.0 Micro-B  - Others: GPIO, I2C, I2S, SPI, UART  - Mechanical: 69 mm x 45 mm, 260-pin edge connector | ~5.200.000 vnd |
| **Raspberry Pi3** | Low | - CPU: quad-core A53 (ARMv8) 64-bit SoC @1.4GHz  - RAM: 1GB LPDDR2 SDRAM  - Connectivity: 2.4GHz and 5GHz IEEE 802.11 b/g/n/ac wireless LAN, Bluetooth 4.2, BLE, Gigabit Ethernet over USB 2.0 (Maximum 300Mbps).  - USB: 4 x 2.0  - Multimedia: H.264, MPEG-4 decode (1080p30), H.264 encode (1080p30); OpenGL ES 1.1, 2.0 graphics | ~1.600.000 vnd |
| **Raspberry Pi3 +Intel Neural Compute Stick 2** | Medium | Vision Processing Unit: Movidius Myriad X | ~4.600.000 vnd |
| **Google Egde TPU Dev Board** | High | - **SOM**  + NXP i.MX 8M SOC (Quad-core Cortex-A53, plus Cortex-M4F)  + Google Edge TPU ML accelerator coprocessor  + Cryptographic coprocessor  + Wi-Fi 2x2 MIMO (802.11b/g/n/ac 2.4/5GHz)  + Bluetooth 4.1  + 8GB eMMC  + 1GB LPDDR4  - **USB Connections**  + USB Type-C power port (5V DC)  + USB 3.0 Type-C OTG port  + USB 3.0 Type-A host port  + USB 2.0 Micro-B serial console port  - **Audio connections**  + 3.5mm audio jack (CTIA compliant)  + Digital PDM microphone (x2)  + 2.54mm 4-pin terminal for stereo speakers  - **Video connections**  HDMI 2.0a (full size)  39-pin FFC connector for MIPI-DSI display (4-lane)  4-pin FFC connector for MIPI-CSI2 camera (4-lane)  - **MicroSD card slots**  - **Gigabit Ethernet ports**  - **40-pin GPIO expansion headers**  -**Supports Debian Linuxs**  - **Models are built using TensorFlow**  - **Fully supports MobileNet and Inception architectures though custom architectures are possible**  - **Compatible with Google Cloud** | ~5.000.000 vnd |
| **LattePanda** | Low | LattePanda - DFRobot | Mouser  + Intel Cherry Trail Z8350 Quad Core Processor  + Base Frequency: 1.44GHz (1.92GHz Burst Frequency)  + Operating System : Windows 10 Home Edition (Unactivated)  + RAM : 4GB DDR3L  + Storage Capacity : 64GB  + GPU: Intel HD Graphics, 12 EUs @200-500Mhz, single-channel memory  + USB 3.0 x 1, USB 2.0 x 2  + Wi-Fi 802.11n 2.4G  + Bluetooth 4.0  + Integrated Arduino Co-processor: ATmega32u4 (Arduino Leonardo)  + Video output: HDMI and MIPI-DSI  + Onboard touch panel overlay connector  + Supports 100Mbps Ethernet  + Intel Processor GPIO x 6  + ATmega Processor GPIO x 20  + Gravity Interface Connectors x 6  + Voltage: 5V@2A  + Board Dimensions: 88 x 70mm / 3.46 x 2.76"  + Package Dimensions: 110 x 94 x 30 mm/4.33 x 3.70 x 1.18"  + RoHS, FCC and CE Compliant | ~5.000.0000 vnd |

Ngoài ra còn có các loại module AI khác nhưng đều cần máy host để cắm vào nên chi phí có thể khá cao.

**Kết luận**: Đối với việc xử lí tại biên hai bài toán Face-Recognition và Motion Detection ta cần máy tính có hiệu năng xử lí AI đủ mạnh để đảm bảo tính real-time và chính xác cho hệ thống, cùng với yếu tố giá thành sản phẩm thì **Jetson Nano** và **Google Egde TPU** **Dev Board** là hai máy tính có thể đáp ứng các yêu cầu trên