UP SQUARED* AI VISION X DEVELOPER KIT

Implement computer vision solutions and run deep learning inference using the CPU, GPU, or an optional VPU.

Get Started  Buy
Overview

Preinstalled Computer Vision Software

Use the Intel® Distribution of OpenVINO™ toolkit for hardware acceleration of deep learning inference for computer vision applications.

Hardware Acceleration

Harness the performance of Intel®-based accelerators for deep learning inference with the CPU and GPU included in this kit or with an optional VPU.

Reduce Time to Field Trial

The included production-ready system with mountable aluminum chassis and camera can be deployed as is and has an operating temperature range of 0°C to 40°C.

Who Needs This Product

Information and operational technologists who:
- Are new to IoT commercial platforms and need a simple path without a steep learning curve
- Need a quicker path to deployment

Use Cases

- Face detection and analysis
- Retail audience analytics
- Pedestrian detection and analysis
- Traffic monitoring and license plate recognition

Brand Recognition and Inventory Management (video)
Personal Protective Equipment Analysis (video)

Reference Implementations

Build a Facial Recognition Access Application
Create a People Counter Application
Browse All Reference Implementations
## Kit Details

### Hardware
- UP Squared board with Intel Atom® X7-E3950 processor (quad core) and 8 GB of RAM and 64 GB eMMC
- USB camera with a maximum resolution of 1920p x 1080p at 30 frames per second
- Power supply for the UP Squared board
- Optional AI Core X Mini PCIe* card with the Intel® Movidius™ Myriad™ X Vision Processing Unit (VPU)
- Aluminum enclosure
- CE, FCC certified with the designated Wi-Fi* and LTE module

### Preinstalled Software
- Ubuntu® 16.04 desktop
- Intel® Distribution of OpenVINO™ toolkit 2018 R5 release
- Intel® System Studio 2019 Ultimate Edition (update 2)
- Intel® Media SDK
- Drivers for Intel® VTune™ Amplifier, Intel® Energy Profiler, Intel® Graphics Performance Analyzers
- MRAA and UPM I/O and sensor libraries for C++, Python*, Java*, and JavaScript*

### Optional Add-ons
- Wi-Fi Card
- LTE Module (EU Only)

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### Intel® Vision Accelerator Design Products

The UP Squared® AI Vision X Developer Kit can be ordered with an optional preinstalled vision accelerator that enables:
- Faster inferencing at the edge
- Offload processing from the CPU and GPU to the AI Core X Mini PCIe* card with the Intel® Movidius™ Myriad™ X Vision Processing Unit (VPU)
## Hardware Specifications

### System Requirements
- HDMI* or DisplayPort* compatible monitor
- USB keyboard and mouse
- Ethernet connection (for internet connectivity)

### System Board
- Intel Atom x7-E3950 processor (1.6 GHz quad core, burst up to 2.0 GHz)
- Integrated Intel HD Graphics 505 with 18 execution units
- 8 GB LPDDR4 system memory
- 64 GB eMMC

### Available I/O Interfaces
- GPIO
- I2C
- SPI
- UART
- PWM
- i2s
- HDMI and DisplayPort
- Dual gigabit Ethernet ports
- USB 3.0

### Expansion Slots
- 1 - SATA 3
- 1 - Mini PCIe*
- 1 - M.2 2330

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## Documentation & Downloads

### Documentation
- Intel Atom® X7-E3950 Processor Specifications
- UP Squared* Board Specifications
- Inference Engine Developer Guide
- Intel® Movidius™ Myriad™ X VPU Product Information

### Support
Support is provided by the UP community.

### Tutorials
- Transfer Your Project from Arduino Create to Intel System Studio
- Browse All Code Samples on GitHub*
Tools

- Arduino Create*
  - A cloud-based development solution
  - Integrated with Intel®-based boards and libraries
  - Large community collection of guides, projects, and training for all levels

- Intel® System Studio 2019
  - Optimize production and performance
  - Get cross-platform support
  - Quickly identify and analyze performance across network, devices, and remote systems
  - Reduce system power consumption by collecting and analyzing power behavior
  - Access Intel® Advanced Vector Extensions 512 instructions

- Intel® Distribution of OpenVINO™ Toolkit
  - Enable CNN-based deep learning inference on the edge
  - Support for heterogeneous execution across various accelerators—CPU, GPU, Intel® Movidius™ Myriad™ X, and FPGA—using a common API
  - Speed up time to market via a library of functions and preoptimized kernels
  - Preinstalled models included with the Intel Distribution of OpenVINO toolkit R5 release

Release Notes |
Documentation
Customize Your Up Squared Board for Production

Advance your prototype to the next stage through custom software and hardware offered by AAEON and Canonical.

- Explore the different UP Squared board configurations to fit your specific workload.
- Find out more about Customization Services for Hardware from AAEON.
- Learn more about Ubuntu Customization and Deployment from Canonical.

<table>
<thead>
<tr>
<th>Tools</th>
<th>Training</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intel® Distribution of OpenVINO™ Toolkit</td>
<td>IoT Training</td>
</tr>
<tr>
<td>Intel® Media SDK</td>
<td>Tech.Decoded</td>
</tr>
<tr>
<td>Intel® System Studio</td>
<td>GitHub*: Intel® IoT Developer Kit</td>
</tr>
<tr>
<td>Intel® Software Development Kits</td>
<td>01.org</td>
</tr>
<tr>
<td></td>
<td>YouTube*: Intel® IoT</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Related Programs</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Intel® AI: In Production</td>
<td></td>
</tr>
<tr>
<td>Intel® Internet of Things Solutions Alliance</td>
<td></td>
</tr>
</tbody>
</table>