Embedded Camera API
Exploratory Group
Industry Call for Participation
March 2021
Growing Need for Camera API Standards

**Increasing Sensor Diversity**
Including camera arrays and depth sensors such as Lidar

**Multiple Sensors Per System**
Synchronization and coordination become essential

Cost and time to integrate and utilize sensors in embedded systems has become a major constraint on innovation and efficiency in the embedded vision market

**Increasing Sensor Processing Demands**
Including inferencing. Sensor outputs need to be flexibly and efficiently generated and streamed into acceleration processors

**Proprietary APIs Hinder Innovation**
Vendor-specific APIs to control cameras, sensors and close-to-sensor ISPs prevent rapid integration of new technologies
Benefits of Embedded Camera API Standard

An effective open, cross-vendor open standard for camera, sensor and ISP control could provide multiple benefits:

- Cross-vendor portability of camera/sensor code for easier system integration of new sensors
- Preservation of application code across multiple generations of cameras and sensors
- Sophisticated control over sensor stream generation increases effectiveness of downstream accelerated processing

Development of Camera and sensor APIs may also generate new requirements for downstream vision and inferencing acceleration APIs
Genesis of Embedded Camera API Initiative

Repeated industry requests to help solve camera and sensor interoperability issues  

Industry Need

Complementary activities but increasing shared recognition that camera sensors are being tightly integrated with image, vision and inferencing accelerators in self-contained embedded systems

Machine Vision

EMVA and Khronos working together to bring together a strong and diverse industry quorum to explore meaningful industry cooperation

Significant industry interest indicates the time may be right for a standardization initiative
Exploratory Group Process

Exploring real-world industry requirements for open and royalty-free embedded camera and sensor API standards

**Embedded Camera API Exploratory Group**

- **Online discussion forum and weekly Zoom calls, probably for a few months**
- **No detailed design activity to protect participants IP**
- **Explore if consensus can be built around an agreed Scope of Work document**
- **Discuss what standardization activities can best execute actions in the Scope of Work**

- **Any company is welcome to join**
- **No cost or IP Licensing obligations**
- **Project NDA to cover Exploratory Group Discussions**

**NO PREDETERMINED OUTCOME**

Next steps to be driven by requirements and use cases - maybe at Khronos, EMVA, both or somewhere else entirely e.g., open-source projects

**Initiation of standards or open-source projects at existing organizations with proven processes and IP Frameworks**

**Scope of Work Document**

Agreed SOW document released from NDA and made public
Exploratory Group Discussion Stages

1. Level-setting
All EG members invited to present on relevant PUBLIC technologies or projects, pain points that they are experiencing, and requirements they feel are key

2. Brainstorming
Discussion on potential directions to fill in identified standardization gaps - no ideas out of bounds

3. Triage and Author SOW
Attempt to generate consensus on standardizations activities that would garner industry participation and produce a Scope of Work document

Typically, each stage can take 1-2 months
Industry Call For Participation

Embedded Camera API Exploratory Group Goals
Enable industry dialog to seek consensus on:
Is industry cooperation over camera/sensor/ISP interoperability API(s) beneficial?
And if so, what API(s) are needed...
...and how and where should the industry organize to create those API(s)?

All companies, universities, consortia, open-source participants welcome!
Explore the creation of open royalty-free API standards for embedded cameras and sensors!
Open to all at no cost!

The right open standard at the right time can be a win-win for all in the industry
https://www.khronos.org/embedded-camera/#getinvolved