Multi-camera system and Image processing for UAV and embedded applications

Multi-camera comprehensive system

Our expertise is to deploy disruptive low-level technologies

Components of the system

- XIMEA industrial cameras and associated technologies
- NVIDIA Jetson TX1/TX2 module with carrier board
- Fastvideo SDK for high-performance imaging on CUDA
- MRTech proprietary full image processing pipelines

Features

- ✓ High-performance, low-power, small, light, multi-camera system
- ✓ Image pre-processing, disk storage, video encoding, streaming, etc.
- ✓ Small implementation time

source: SKAT Systems www.skat.systems

XIMEA cameras

Innovative XIMEA industrial cameras and compatible technologies

- diversified XIMEA industrial cameras

- colour, monochrome, IR-extended and hyperspectral cameras

- compact CMOS cameras - from 2.3 MPix (165 fps) to 12 MPix (31 fps)

- high-performance PCIe cameras - from 12 MPix (130 fps) to 50 MPix (30 fps)

- high-speed cameras - from 1.1 MPix (3500 fps) to 16 MPix (300 fps)

- scientific CCD, sCMOS, X-Ray, hyperspectral (HSI) cameras etc.

Camera interfaces

- ✓ USB3 and USB 3.1

- ✓ PCIe Gen2/Gen3, x2-x8

source: XIMEA www.ximea.com

NVIDIA Jetson TX1 / TX2 module

NVIDIA Jetson Tegra X1/X2 supercomputer module

- Revolutionary NVIDIA Maxwell™ or Pascal™ architectures

- Jetson TX1 – 256 CUDA cores, Quad ARM® A57/2 CPU

- Jetson TX2 – 256 CUDA cores, Dual Denver Quad ARM® A57/2 CPU

Specialized TX1/TX2 carrier board

- designed by XIMEA xiLab
- 10/100/1000 Ethernet
- WiFi - IEEE 802.11ac (800Mbps)
- Bluetooth 4.0 (24 Mbps)
- 2x USB 3.0 port for FFC/FPC cable
- 2x PCIe Gen2 x2 ports for FFC/FPC cable
- GPIO

source: XIMEA www.ximea.com

High-performance Image processing

MR TECH
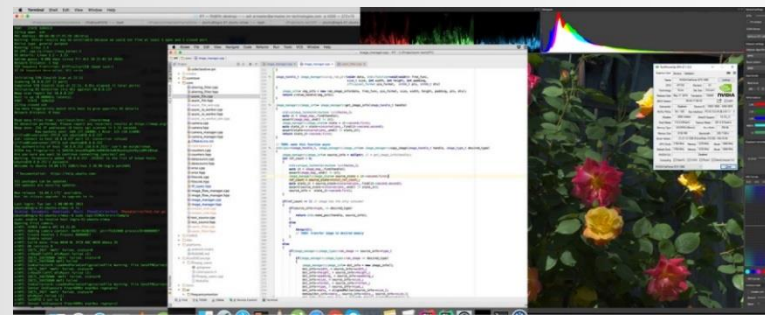
High performance image processing software

MRTech SK develops proprietary cross-platform software for building full image processing pipelines.
MRTech SK offers service to implement and customize integrated software solutions for customer's hardware platforms.

More information at
https://mr-technologies.com/image-flow-framework/

Fastvideo

Fastvideo SDK - high speed imaging pipeline on NVIDIA GPU

SDK is a set of separate components which correspond to image processing pipeline steps, such as demosaicing, denoising, resizing, sharpening, color correction, 1D and 3D LUTs, JPEG and JPEG2000 compression, etc.

See more at http://www.fastcompression.com/products/sdk/sdk.htm

DRONE 2017 exhibits

Case 1

Hardware

- Three 3.1 MPix XIMEA cameras
- NVIDIA Jetson TX2 with carrier
- 20W power consumption

Image processing

- 3x 3.1 MPix (up to 55 fps) images acquisition, black level, white balance, demosaicing
- Render on the screen or H.264 encoding and streaming

Case 2

Hardware

- 20 MPix main and 5 MPix front cameras
- NVIDIA Jetson TX1 module with carrier
- SSD 960 PRO NVMe M.2 512GB
- 25W power consumption

Image processing

- 5K image acquisition (main camera)
- Black level, white balance, demosaicing, YUV 4:2:0 conversion, SSD writing
- H.265 encoding and streaming of 4K images with 40 fps and 35 ms latency

Contacts

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XIMEA, Fastvideo, MRTech SK companies are NVIDIA community members.

MRTech SK is a VAR partner of XIMEA and Fastvideo and provides overall solutions worldwide.