



Continental Engineering Services

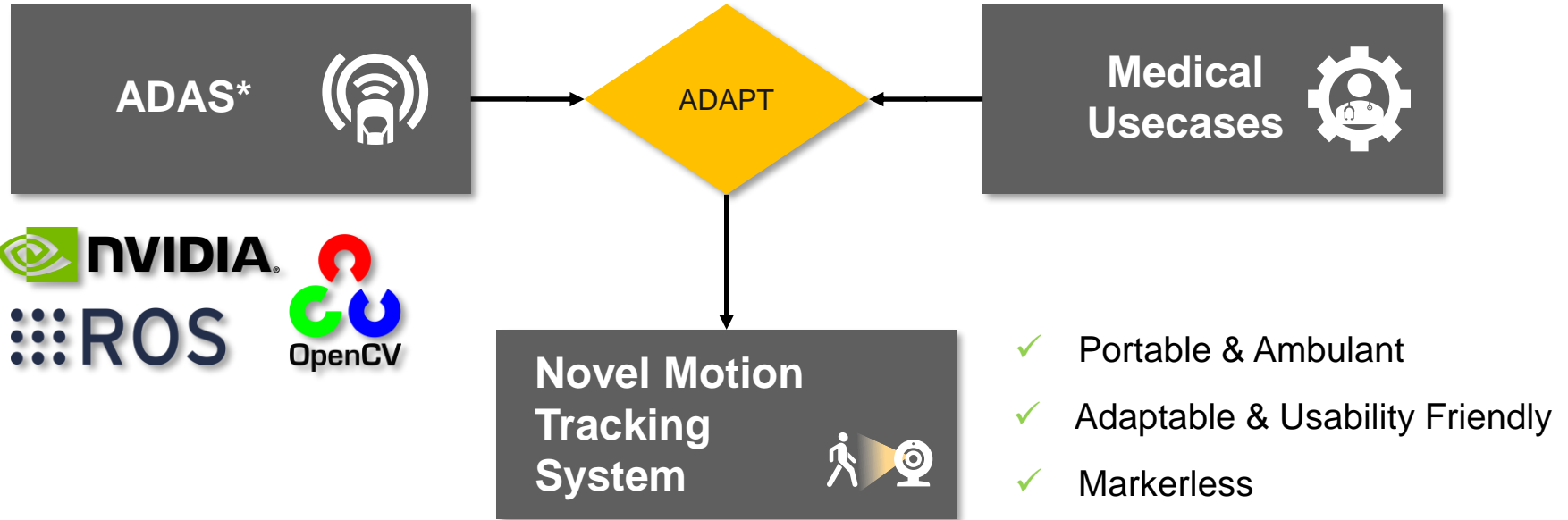
Embedded Motion Tracking System

Pragmatic – Versatile – Responsive

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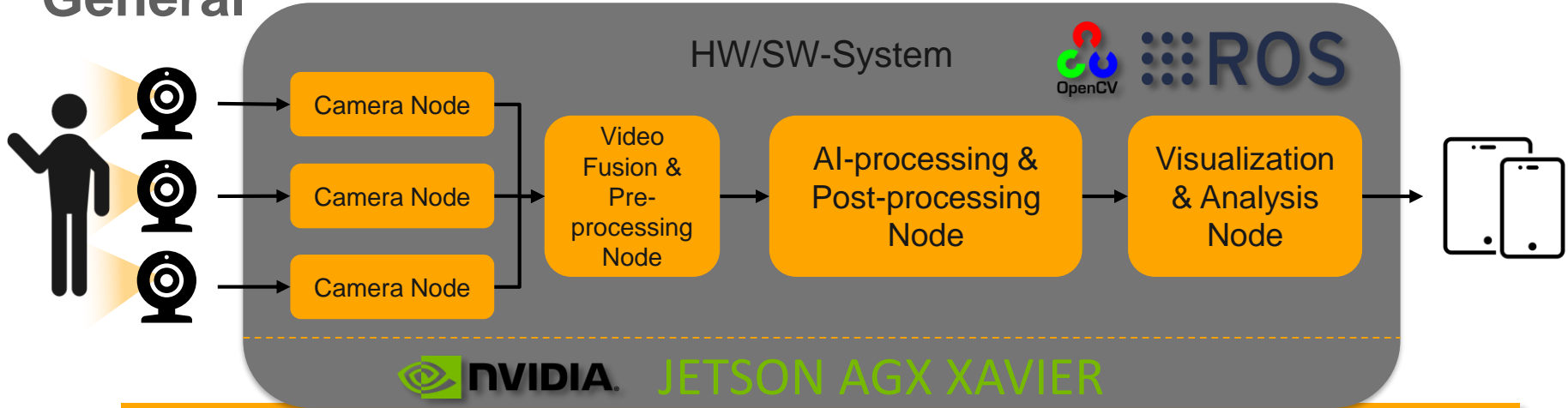
General Approach



*Advanced Driver Assistance Systems

System Overview

General



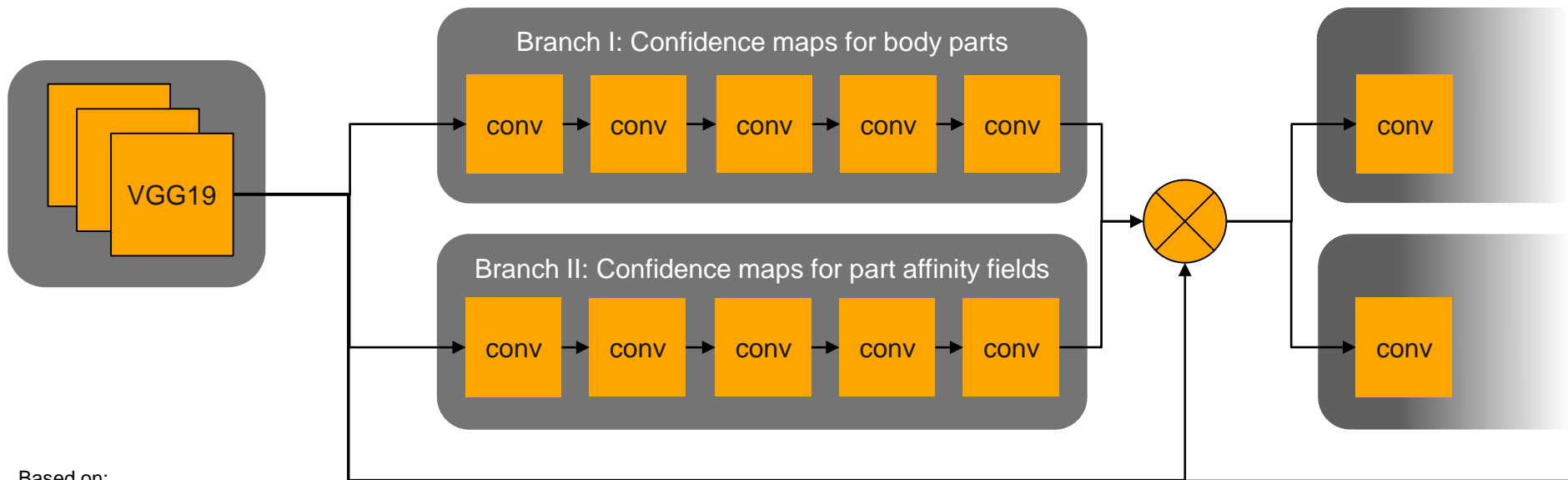
Keyfacts

- Up to 120 Hz framerate (offline)
- Up to 3 cameras (stereo calibrated)
- Optimized & adapted neural network
- Stream-able GUI with direct feedback*

* designed with: <https://github.com/Graph-ICS/Graph-ICS>

System Overview

Neural Network



Based on:

Zhe Cao, Tomas Simon, Shih-En Wei, Yaser Sheikh

Realtime Multi-Person 2D Pose Estimation using Part Affinity Fields

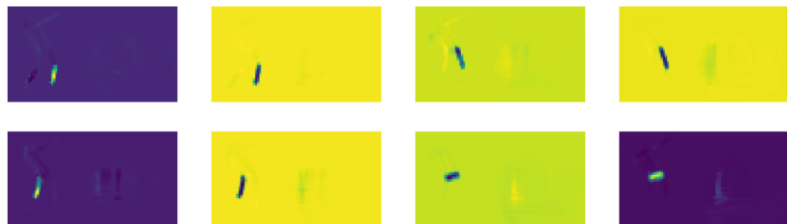
Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition (CVPR), July 2017

System Overview

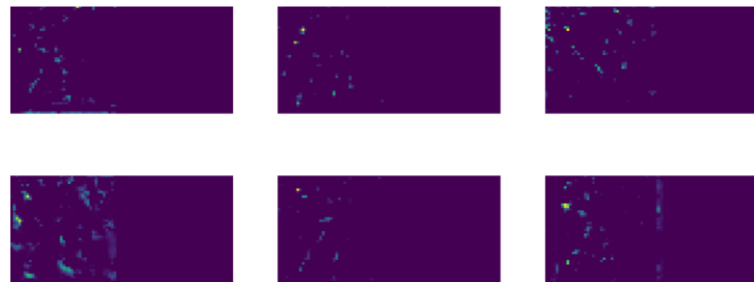
Neural Network



Input image



Outputs of the PAFs



After VGG-19



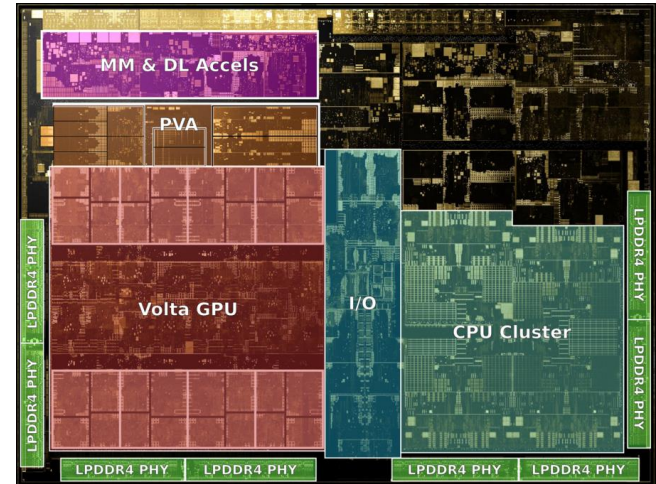
Output of the keypoint heatmaps

System Overview

HW Capabilities

Utilize HW inference performance for network execution:

- Base neural network - 243,76G FMA (Fused Multiply ADDs)
- Nvidia Xavier AGX
 - Volta GPU
 - 11.3 DL TOPS (FP16), 22.6 DL TOPS (INT8)
 - 2 x DLAs
 - 5.7 DL TOPS (FP16), 11.4 DL TOPS (INT8)
- Performance optimization lead to speed up but also to precision loss → need of balancing



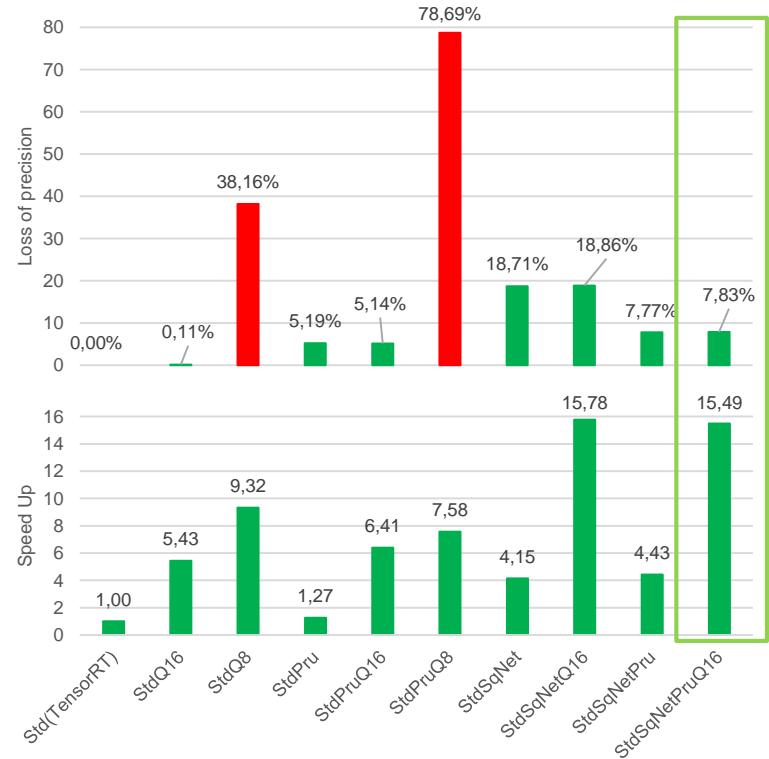
Source: <https://en.wikichip.org/wiki/nvidia/tegra/xavier>

System Optimizations Outlook

Future activities

- › Further performance and quality improvements
- › Currently in validation with clinical partner
- › Transfer learning and different sensor – more features

If you are interested contact us!
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