自主机器人次世代控制核心

边缘智能提供商
Innovating the edge

米文动力
MIIVII TECH

关于米文动力

嵌入式人工智能创新企业

北京米文动力科技有限公司成立于2015年，是一家专业从事嵌入式人工智能科技的高新技术企业，致力于**提供软硬一体边缘计算产品及技术**，是**最早布局NVIDIA Jetson 边缘计算场景的厂商之一**，也是**国内首批英伟达全球生态推荐战略合作伙伴**。

自2015年初至今，米文动力已获得**云天使基金、博彦嘉铭、硅谷资本中国、北汽产投、时间投资等总额上亿的投资**。凝聚了一批来自加州大学、奥克兰理工、中科大、上海交大、人大等国内外知名院校的高学历人才，拥有一支技术精湛、经验丰富的专业研发、技术队伍为用户保驾护航。

多种配置的硬件设备

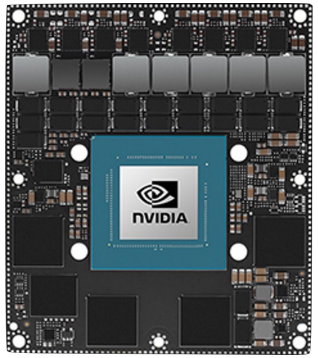
基于云计算的人工智能应用，在很多场景出现延时高、功耗高、带宽占用多、存储压力大、隐私保护差等众多问题。对此，**米文动力打造多种算力的计算产品**，旨在**边缘侧提供低延时、低功耗、高性能的算力平台**，为人工智能算法模型部署和应用落地提供坚实基础。

应用场景丰富

目前公司拥有**自主知识产权40余项**，产品广泛应用于**商用车/特种车辅助驾驶、无人配送车、无人机、无人清扫车、车路协同、工业视觉、零售安防**等领域。单个产品出货量超过**K级**，业务从中国拓展到美国、澳大利亚等**15个国家**，服务海内外各行业头部客户逾**300家**。

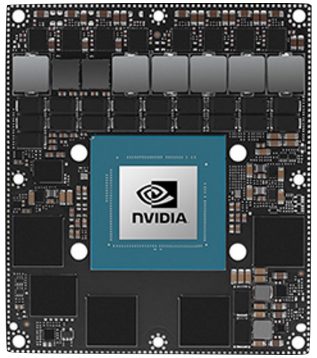
Jetson Orin技术规格介绍

Orin的SOM



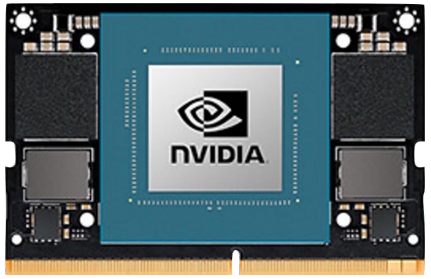
Jetson AGX Orin 64GB

275 Sparse|138 Dense
INT8 TOPS
15W to 60W



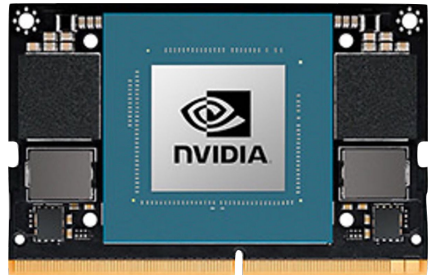
Jetson AGX Orin 32GB

200 Sparse|100 Dense
INT8 TOPS
15W to 40W



Jetson Orin NX 16GB

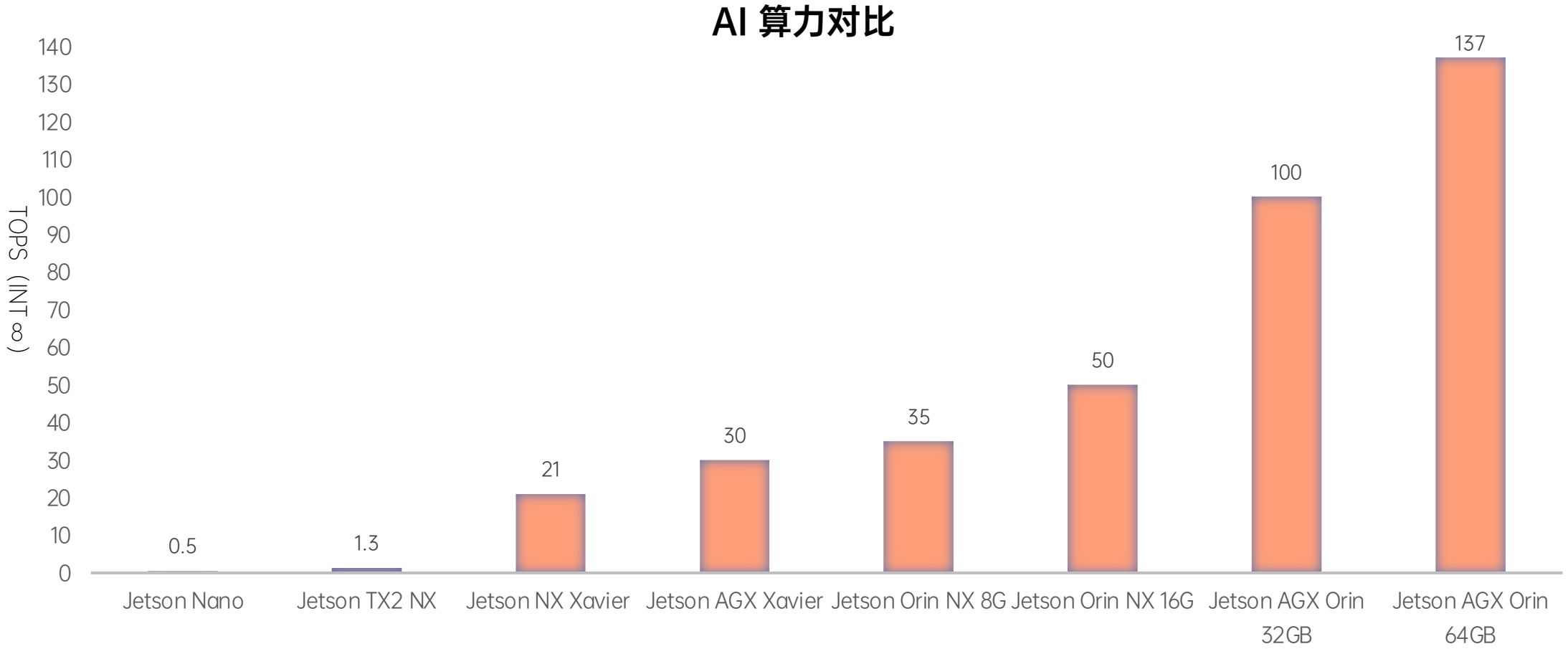
100 Sparse|50 Dense
INT8 TOPS



Jetson Orin NX 8GB

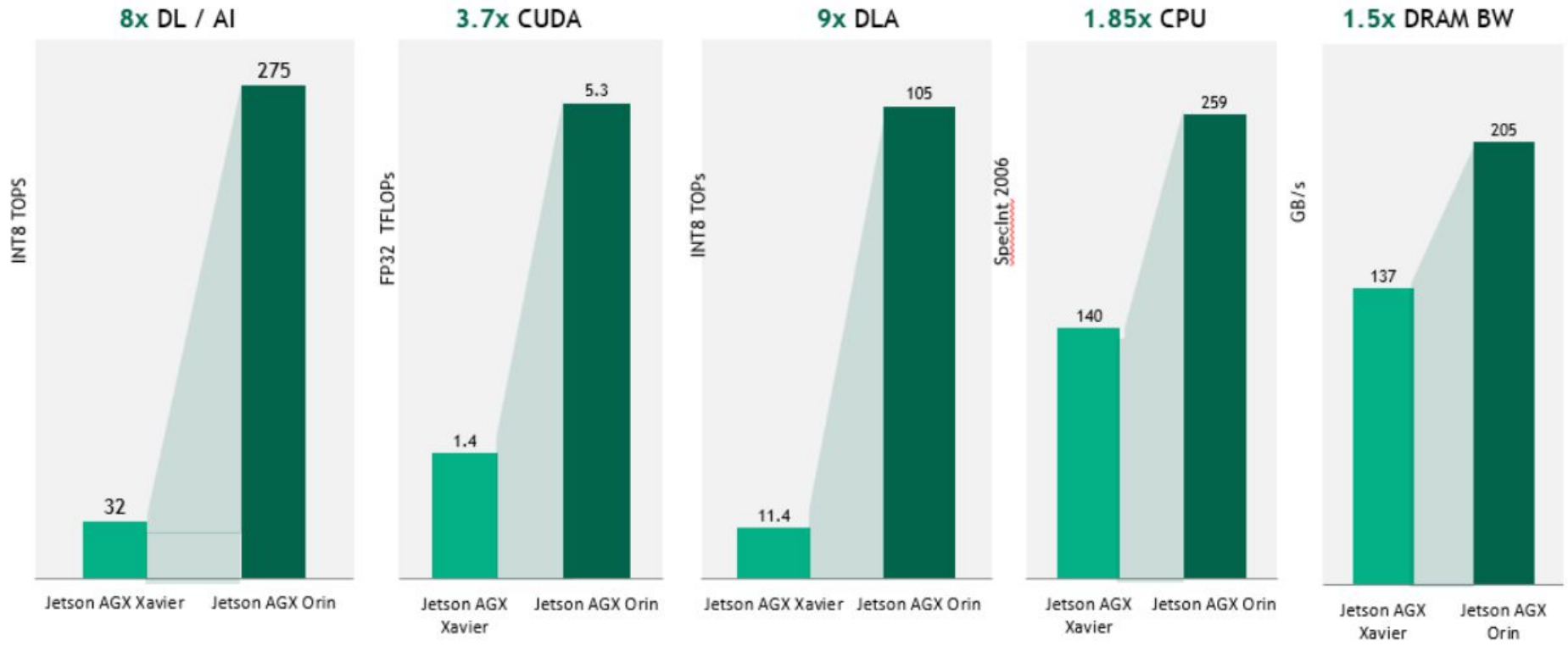
70 Sparse|35 Dense
INT8 TOPS
10W to 20W

Orin在Jetson家族的位置 (Dense)



Jetson AGX Orin Series Block

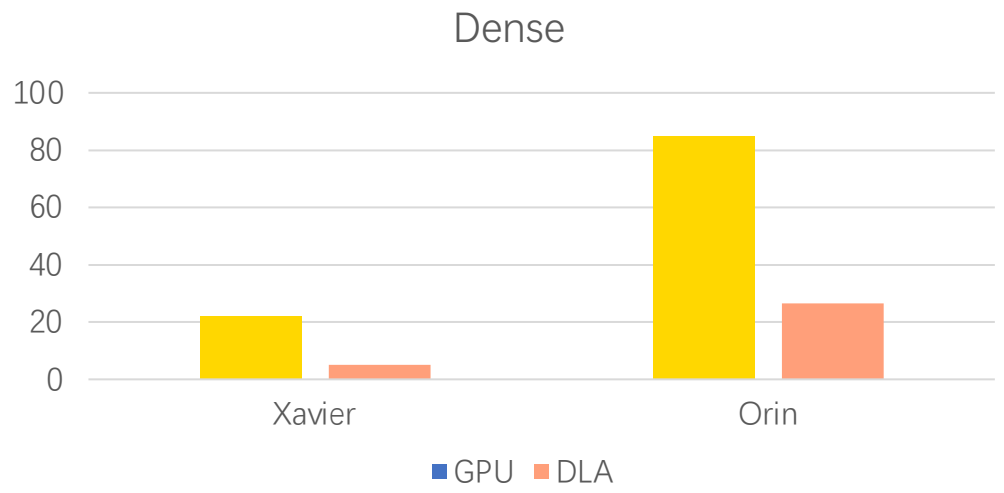
Figure: 1 Jetson AGX Orin delivers 8X the AI performance of Jetson AGX Xavier



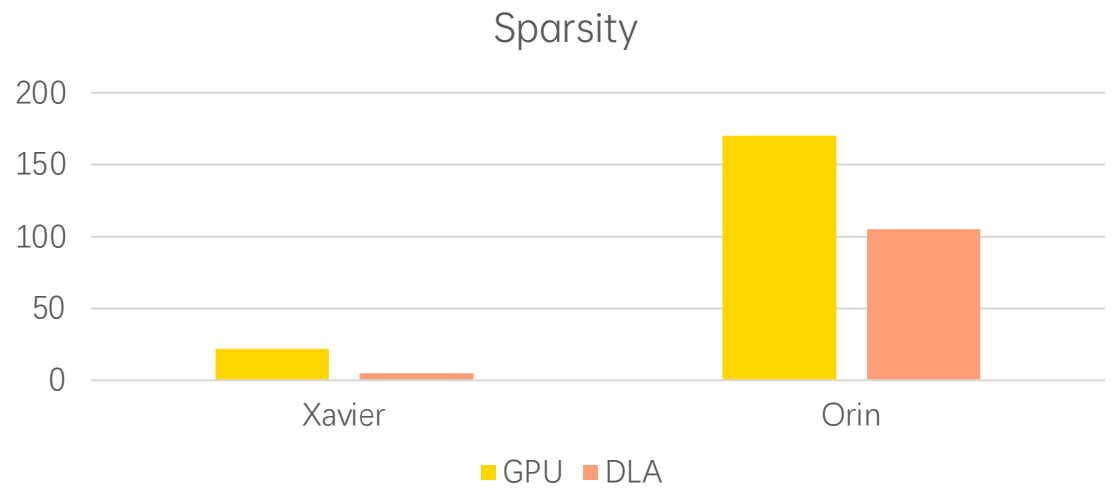
Note: Jetson AGX Orin 64GB Max Performance. Jetson AGX Orin 32GB Performance scales based on the number and frequencies of the CPU, GPU, and DLA.

Orin vs Xavier

	Jetson AGX Xavier	Jetson AGX Orin 64GB
GPU	22TOPS INT8(11TFLOPS FP16)	85 TOPS INT8 (170TOPS INT8 sparsity)
DLA	5TOPS INT8(2.5TFLOPS FP16) x2	26.25 TOPS INT8 dense (52.5 TOPS INT8 sparsity)
Total	32TOPS（DLA占31%)	137.5TOPS INT8 dense (275TOPS sparsity) （DLA占38%)



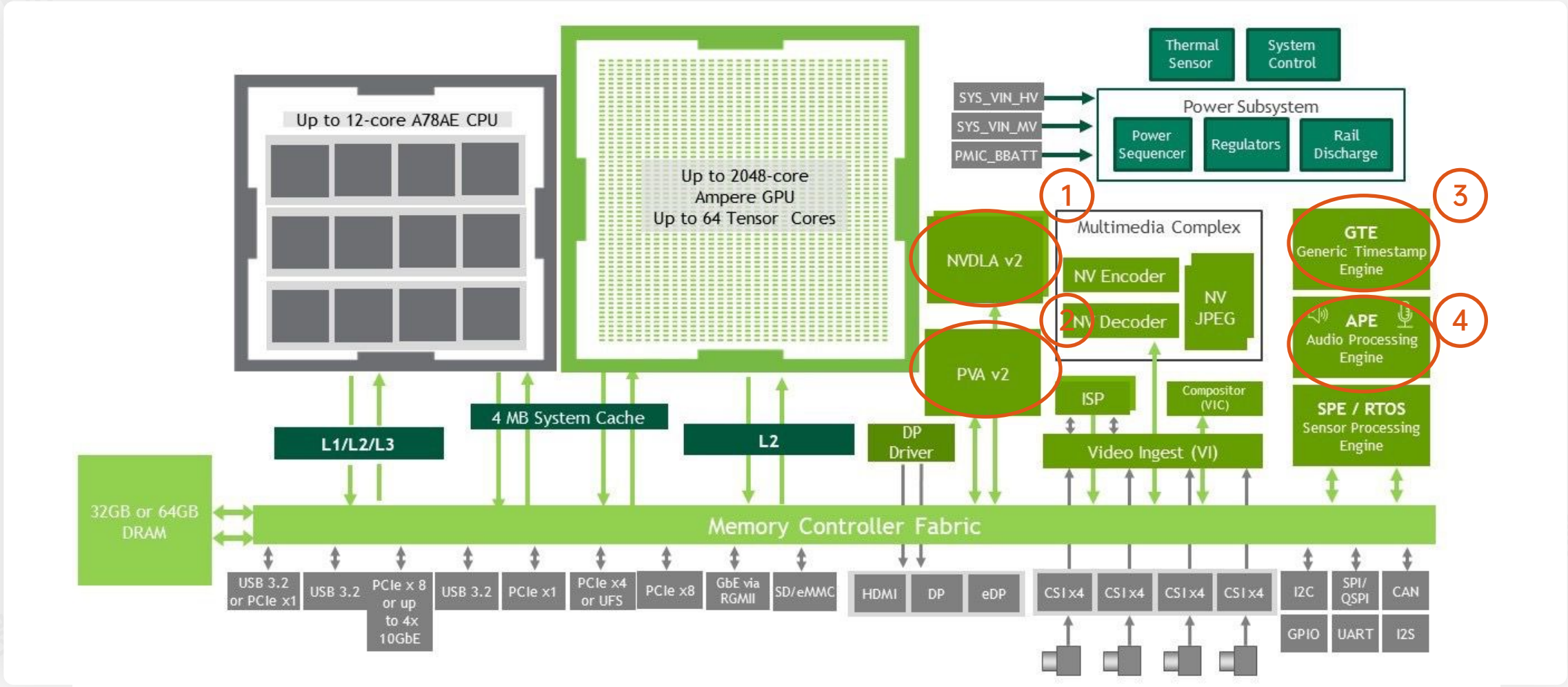
Dense x 4.3



Dense x 8.6

https://forums.developer.nvidia.com/t/how-the-32-tops-of-jetson-agx-xavier-is-calculated/108078

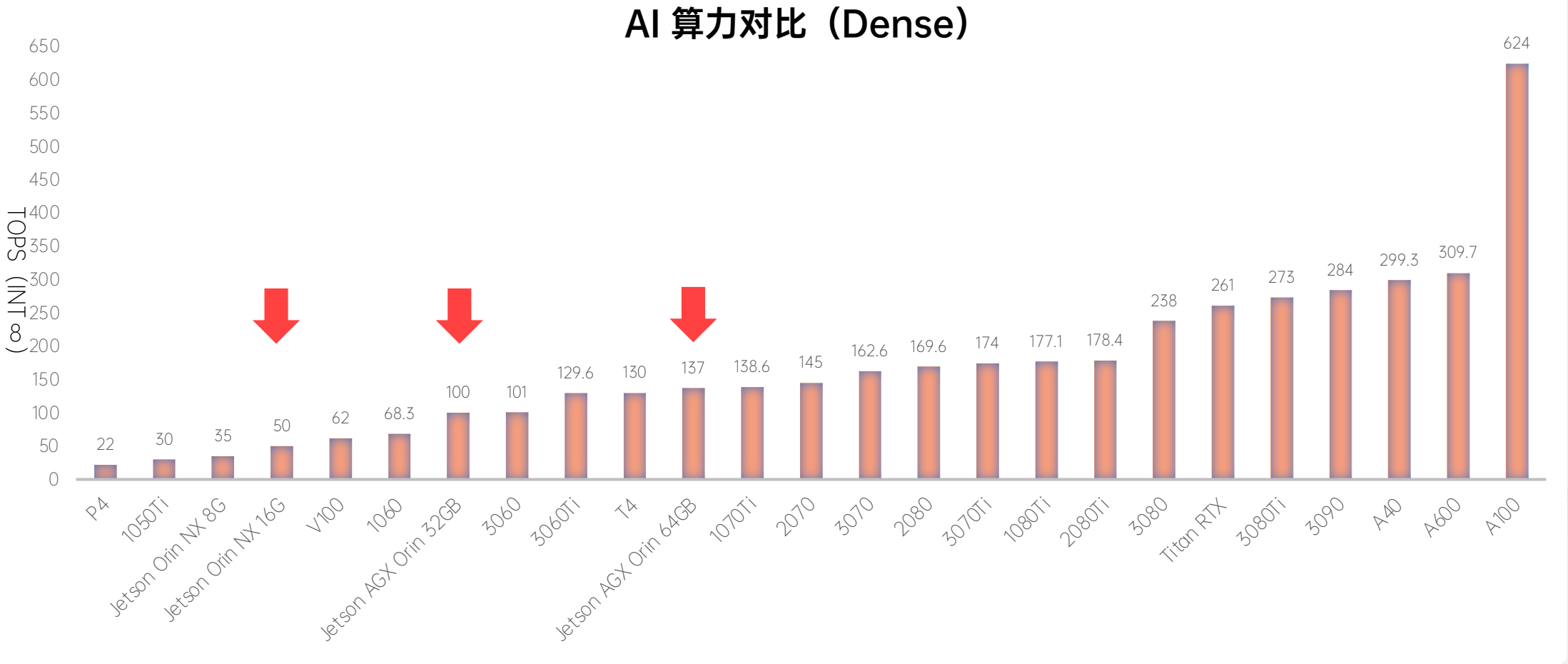
Jetson AGX Orin Series Block



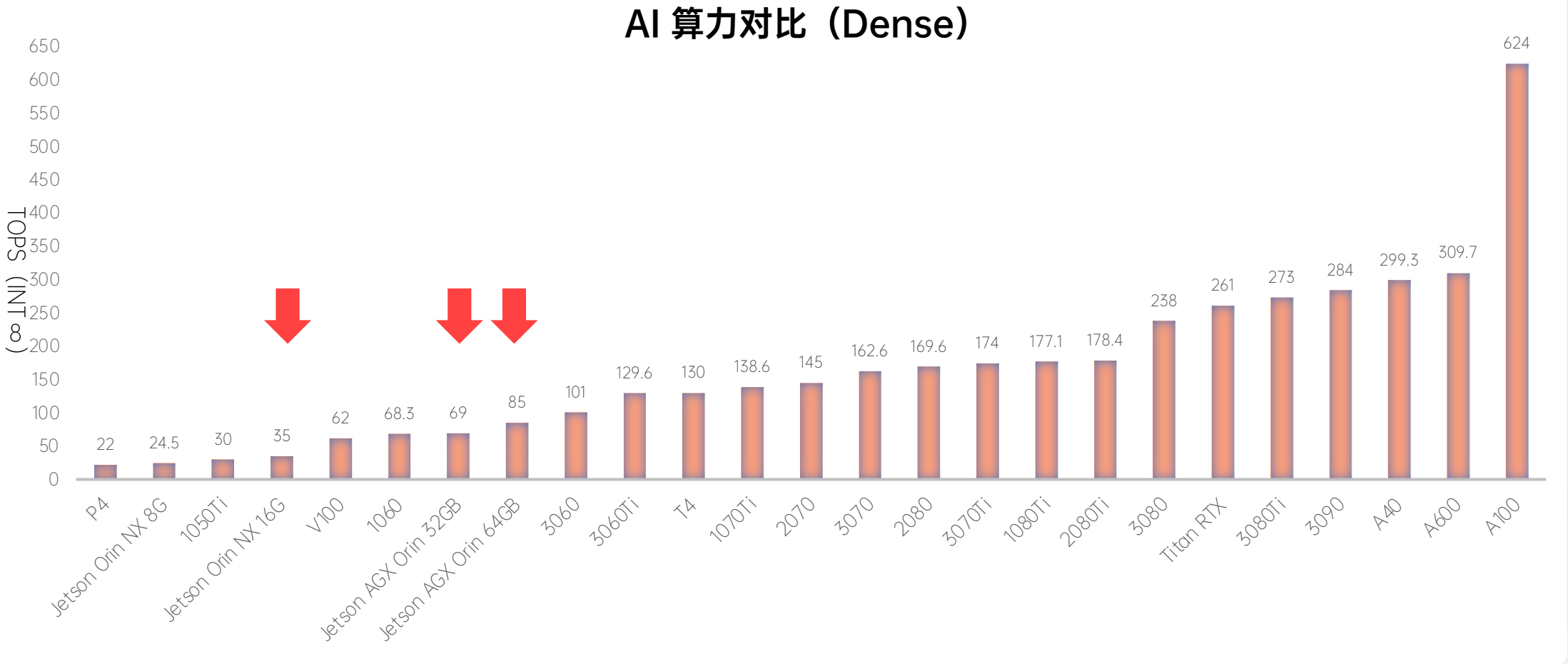
芯片详细介绍


NVIDIA DRIVE WITH ORIN AND AMPERE
5W TO 2,000 TOPS — ONE PROGRAMMABLE ARCHITECTURE
ADAS
Windshield NCAP
10 TOPS, 5W
L2+
Autopilot
200 TOPS, 45W
L5
Robotaxi
2,000 TOPS, 800W
SINGLE SCALABLE ARCHITECTURE—SOFTWARE COMPATIBLE

Orin vs Geforce



Orin GPU vs Geforce



Orin vs Geforce

Performance dgpu- pretrained models

			T4	A100 PCIe	A30	A2	A10
Model Arch	Inference resolution	Precision	GPU (FPS)	GPU (FPS)	GPU (FPS)	GPU (FPS)	GPU (FPS)
PeopleNet- ResNet34	960x544	INT8	451	2171	1395	223	973
TrafficCamNet – ResNet18 License Plate Detection License Plate recognition	960x544 640x480 96x48	INT8	475	1601	NA	NA	NA
TrafficCamNet – ResNet18	960x544	INT8	1401	4803	3295	822	2464
DashCamNet – ResNet18	960x544	INT8	1316	4708	3289	769	2427
FaceDetectIR- ResNet18	384x240	INT8	2516	5514	4679	2854	3157

Performance jetson- pretrained models

			Jetson Orin			Jetson Xavier NX			Jetson AGX Xavier		
Model Arch	Inference resolution	Precision	GPU (FPS)	DLA1 (FPS)	DLA2 (FPS)	GPU (FPS)	DLA1 (FPS)	DLA2 (FPS)	GPU (FPS)	DLA1 (FPS)	DLA2 (FPS)
PeopleNet- ResNet34	960x544	INT8	330	NA	NA	79	23	23	137	29	29
TrafficCamNet – ResNet18 License Plate Detection License Plate Recognition	960x544 640x480 96x48	INT8	347	NA	NA	85	NA	NA	133	NA	NA
TrafficCamNet – ResNet18	960x544	INT8	1056	NA	NA	289	84	84	490	111	111
DashCamNet – ResNet18	960x544	INT8	1112	NA	NA	276	91	91	465	115	115
FaceDetectIR- ResNet18	384x240	INT8	1145	NA	NA	1142	444	444	1983	608	608

Jetson Orin的生态圈

开源框架支持

Apollo

Hello Apollo	Apollo 1.0	Apollo 1.5	Apollo 2.0	Apollo 2.5	Apollo 3.0	Apollo 3.5	Apollo 5.0	Apollo 5.5	Apollo 6.0
Apollo Platfprm Announced	Closed Venue AD	Fixed Lane AD	AD on Simple Urban Road	Geo-fenced Highway AD	Production Level Closed Venue AD	City Urban Road AD	AD Empowering Production	Curb-to-Curb Urban Road AD	Towards Driverless Driving
2017.4	2017.7	2017.10	2018.1	2018.4	2018.7	2019.1	2019.7	2019.12	2020.9

ROS & ROS2

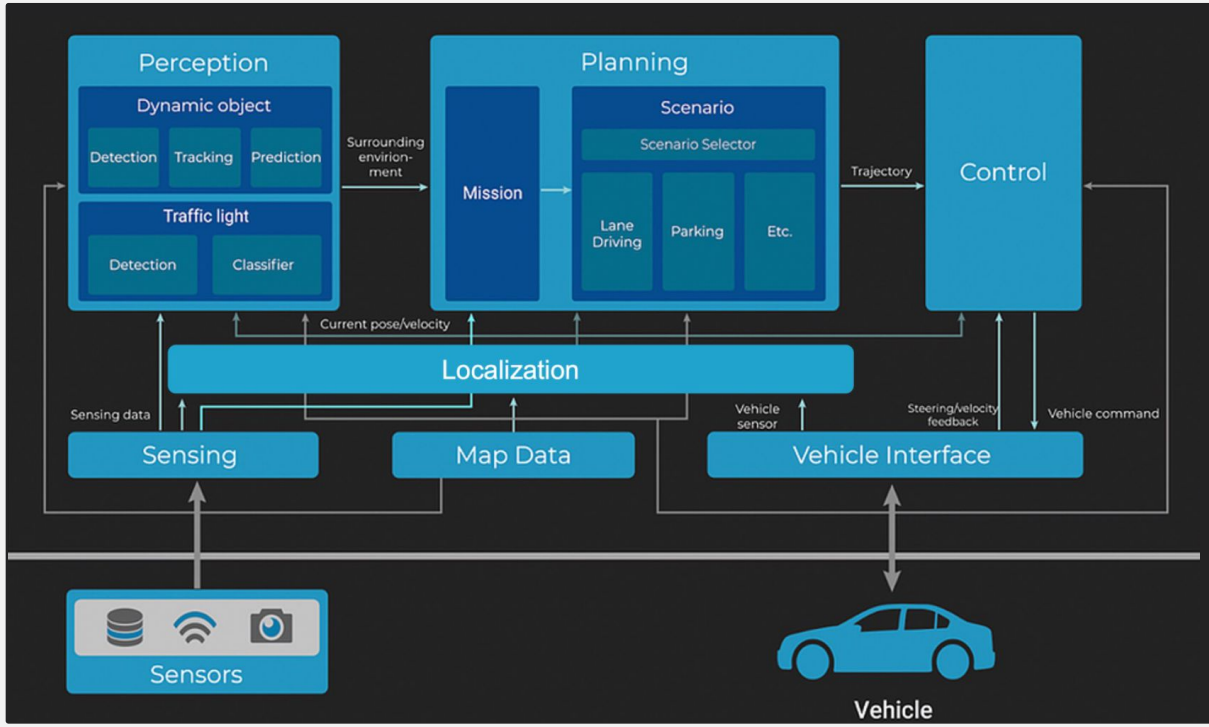
Noetic Ninjemys

ROS Noetic Ninjemys is latest ROS 1 LTS Release targeted at the Ubuntu 20.04 (Focal) release, though other systems are supported to varying degrees.

ROS Foxy

Foxy Fitzroy is the latest ROS 2 LTS release on Ubuntu Focal, macOS and Windows 10. Get Foxy Fitzroy now!

Autoware



ROADMAP

2015-2019	2020	2021	2022	Future
Initial version of Autoware released in2015 Autoware adopted in Many private campus and public road shuttle/Bus implementations	Autonomous valet Parking(AVP) Support in Autoware v1.0	Cargo Delivery Support in Autoware v1.0 Autonomous Racing FITENTH and IAC	Autoware Core/Universe Arcchitecture introduced Bus on public road support planned in Core for Autoware v3.0 Robo-taxi functionality Introduced into Universe	MaaS/Robo-Taxi Autoware core Targeted to support L4 AD in dense urban environments

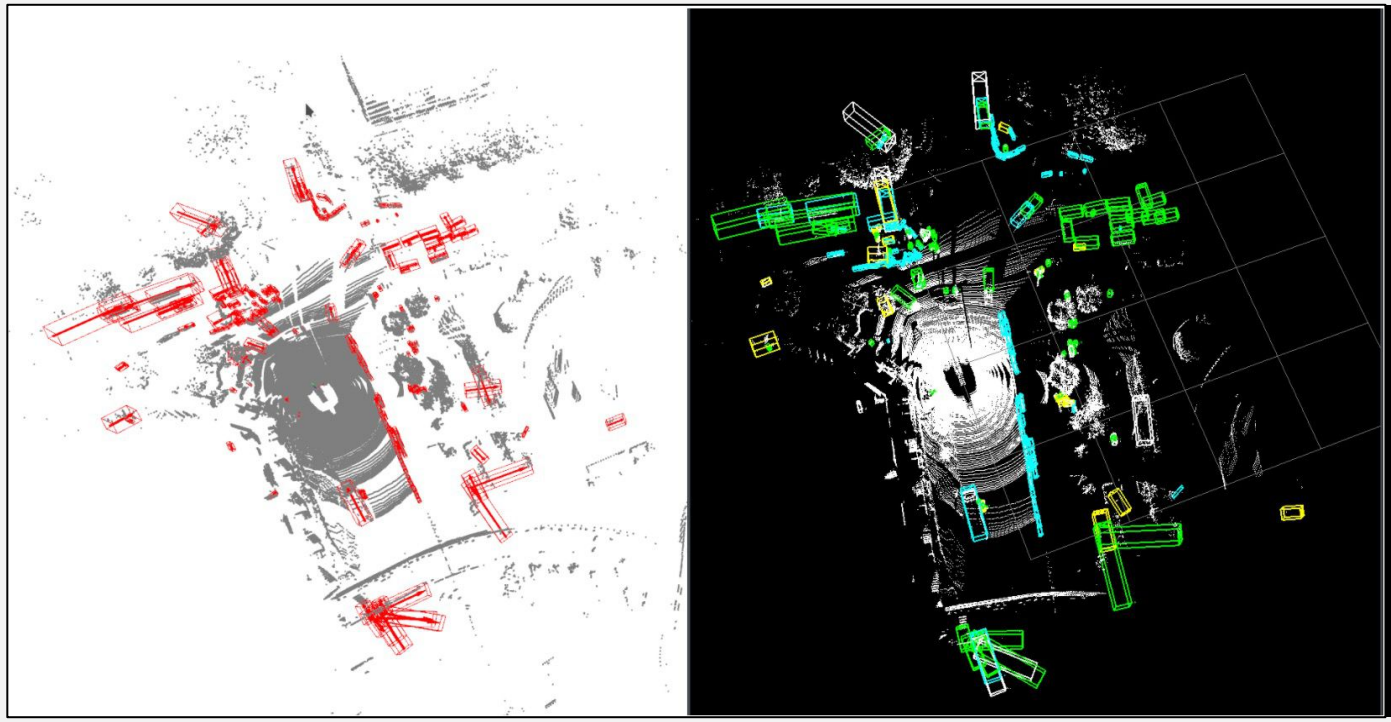
Jetson Orin的场景性能

3D点云定位性能

定位 + Rviz显示
平均CPU占用 < 30%

定位
平均CPU占用 < 15%

3D点云检测性能

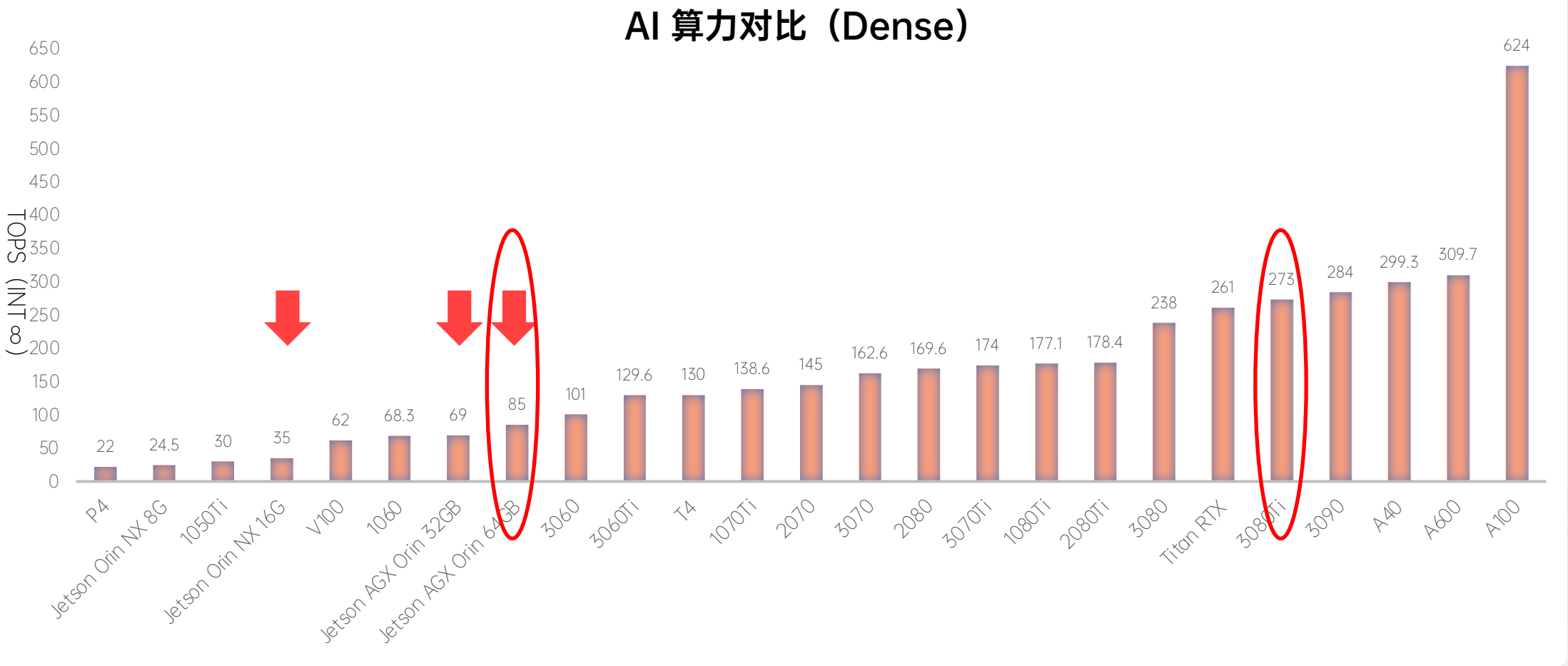


PointPillars

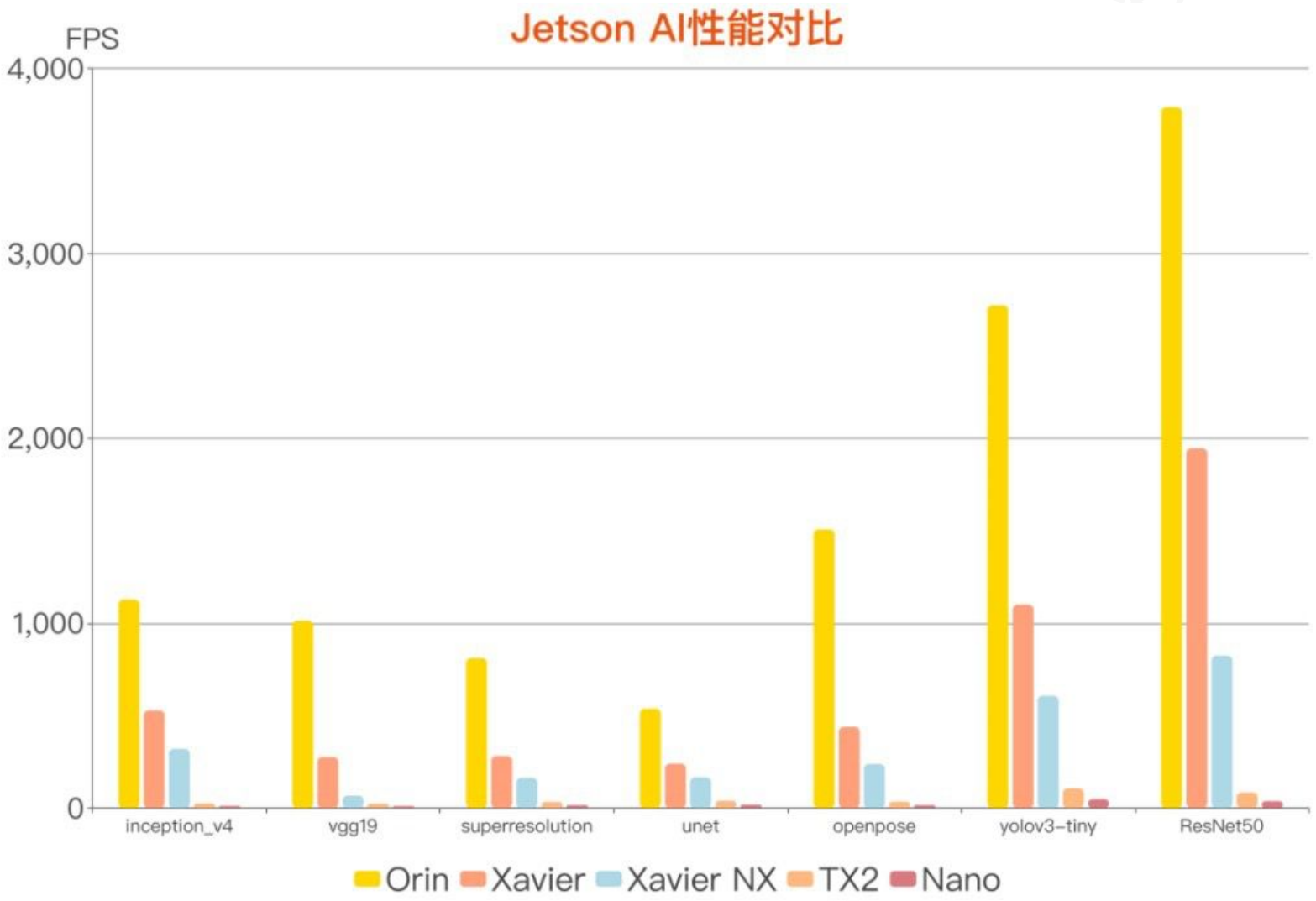
Module	Time
Preprocess	1.89678 ms
Pfe	4.65024 ms
Scatter	0.766277 ms
Backbone	12.5982 ms
Postprocess	12.9825 ms
Summary	32.9036 ms

3080Ti：11 ~ 15ms

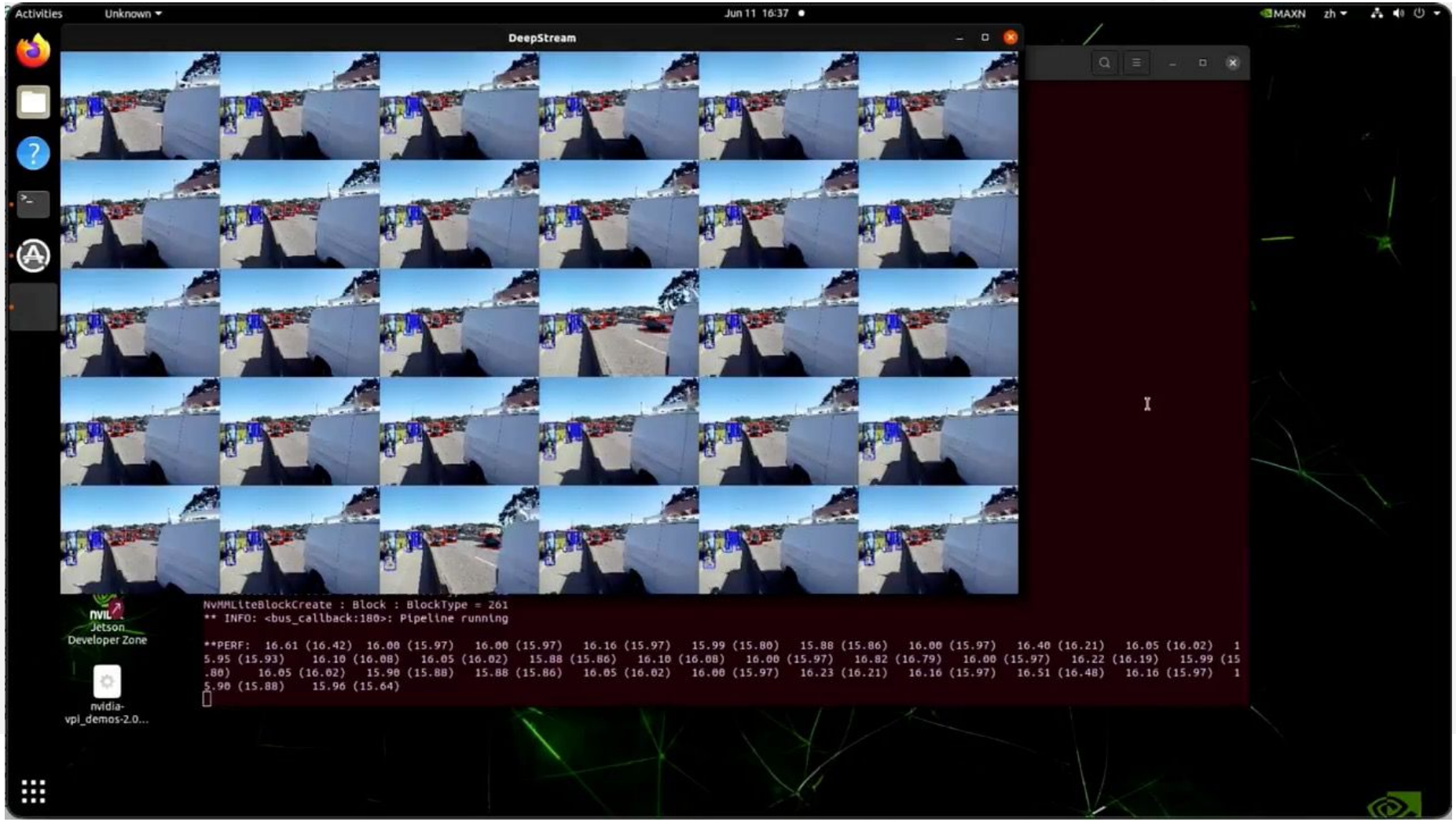
Orin GPU vs Geforce



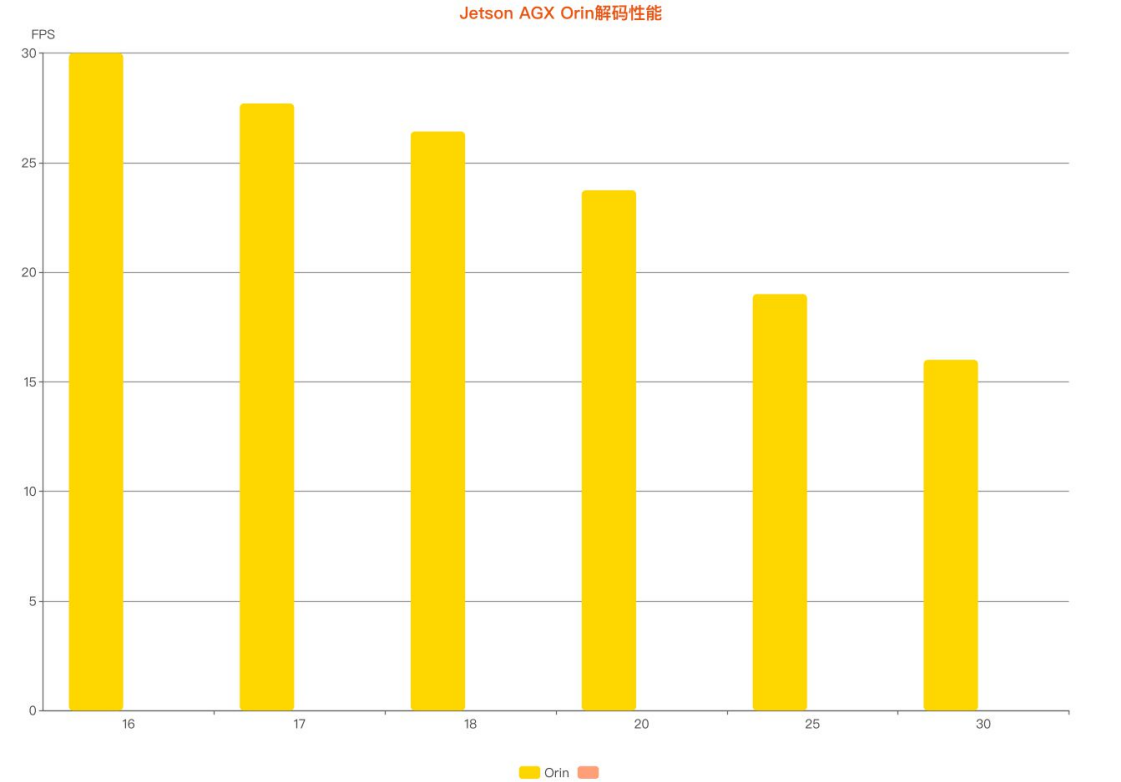
2D推理性能

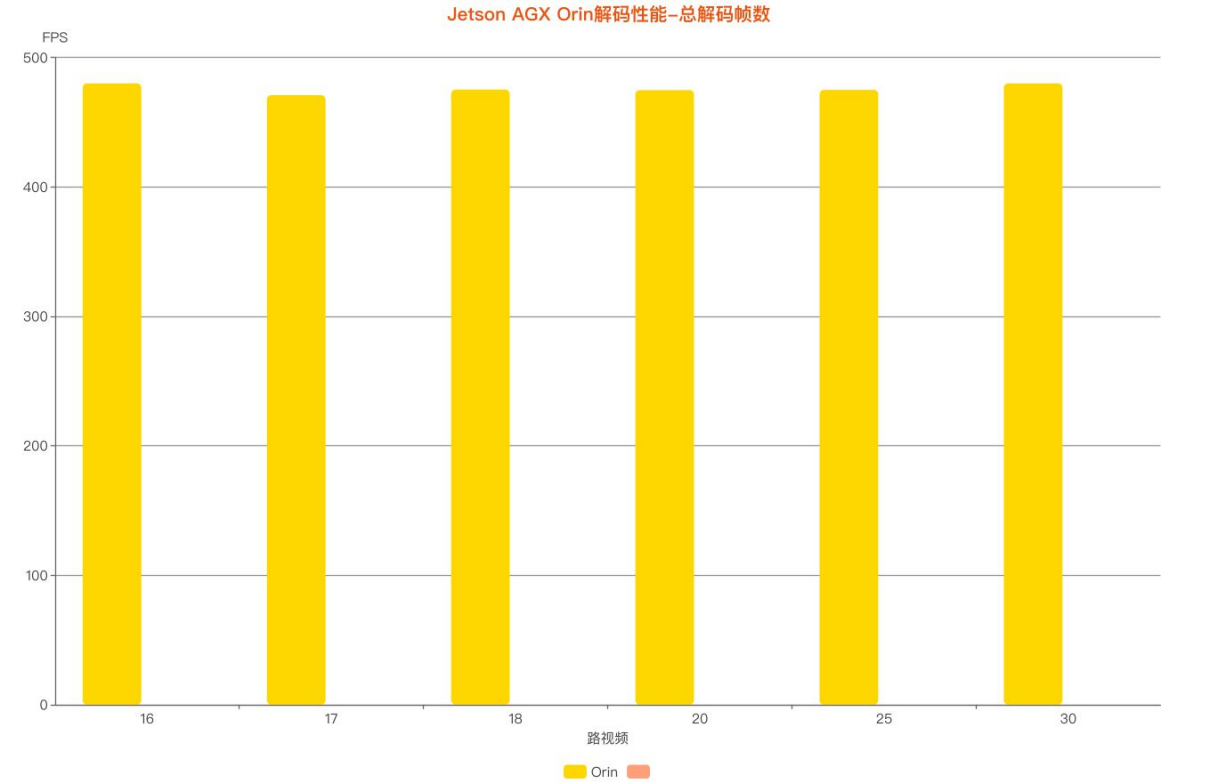

Jetson AI性能对比
FPS
4,000
3,000
2,000
1,000
0
inception_v4
vgg19
superresolution
unet
openpose
yolov3-tiny
ResNet50
Orin
Xavier
Xavier NX
TX2
Nano

视频编解码性能


Activities
Unknown
Jun 11 16:37
MAXN
zh
DeepStream
NVMMLiteBlockCreate : Block : BlockType = 261
** INFO: <bus_callback:180>: Pipeline running
**PERF: 16.61 (16.42) 16.00 (15.97) 16.00 (15.97) 16.16 (15.97) 15.99 (15.80) 15.88 (15.86) 16.00 (15.97) 16.40 (16.21) 16.05 (16.02) 15.95 (15.93) 16.10 (16.08) 16.05 (16.02) 15.88 (15.86) 16.10 (16.08) 16.00 (15.97) 16.82 (16.79) 16.00 (15.97) 16.22 (16.19) 15.99 (15.80) 16.05 (16.02) 15.90 (15.88) 15.88 (15.86) 16.05 (16.02) 16.00 (15.97) 16.23 (16.21) 16.16 (15.97) 16.51 (16.48) 16.16 (15.97) 15.90 (15.88) 15.96 (15.64)
Jetson Developer Zone
nvidia-vpi_demos-2.0...

视频编解码性能


Jetson AGX Orin解码性能
FPS
30
25
20
15
10
5
0
16
17
18
20
25
30
Orin


Jetson AGX Orin解码性能-总解码帧数
FPS
500
400
300
200
100
0
16
17
18
20
25
30
路视频
Orin

MIIVII Apex AD10

- 搭载英伟达JETSON ORIN，275TOPS综合算力
- 多传感器数据融合及微秒级芯片时钟同步
- 8路GMSL 二代车规级摄像头接入
- 4路全千兆以太网口
- 5路CAN FD/CAN 接口
- IP65高防护等级

Processor	NVIDIA Jetson AGX Orin 32GB		NVIDIA Jetson AGX Orin 64GB	
Performance	200 TOPS		275 TOPS	
Video Encode	AV1 1x 4K30，3x 1080p60，7x 1080p30 H.264/H.265 1x 4K60，2x4k30，6x 1080p60，15x 1080p30 VP9 1x 4K60，2x4k30，6x 1080p60，12x 1080p30			
Video Decode	AV1 1x 8K30，2x 4K60，4x4k30，10x 1080p60，20x 1080p30 H.265 1x 8K30，2x 4K60，6x4k30，12x 1080p60，26x 1080p30 H.264 1x 4K60，2x 4K30，6x 1080p60，14x 1080p30 VP9 26x1080p30			
CPU	8 Core ARM® Cortex®-A78		12 Core ARM® Cortex®-A78	
GPU	NVIDIA Ampere 1792-CUDA® Core		NVIDIA Ampere 2048-CUDA® Core	
Memory	32 GB 64 bit LPDDR4 204 GB/s		64 GB 64 bit LPDDR4 204 GB/s	
Storage	64GB eMMC 5.1			
DLA Accelerator	2×NVDLA 2.0 Engines			
I/O	4× Gigabit Port	1× HDMI 2.0	2× USB 3.0	5× CAN FD
	4× In(0-12V) 4× Out(3.3V)		2× GMSL2 4 IN 1 MINI FAKRA TYPE	
	1×Debug(RS232)，3×RS232，2×RS485/RS422			
	1×SYNC_IN(0-12V)，1×SYNC_OUT(3.3V)，1×SYNC_PPS(3.3 V)			
Extension	1× M.2 M Key	1× Mini PCIe	1× Nano SIM Socket	
Function key	1×Power KEY	1×Reset KEY	1×Recovery KEY(Button)	
Power Supply	9V-36V DC			
Mechanical	276mm×214mm×68mm(I/O ports and mounting holes included) 240mm×173mm×68mm(I/O ports and mounting holes excluded)			
Weight	3.0Kg			
IP Rate	IP65			

INNOVATING THE EDGE

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MIIVII TECHNOLOGY

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