



AI ON THE EDGE FOR EARTH OBSERVATION

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SATELLOGIC



- RGBN at 1m - 70cm
- 26 satellites
- Imagery and CaaS

- ~ 30/400 bands payload
- Hosted Payloads
- Edge AI Platform
- end-to-end *crypto*
- 100x more cost-efficient

- Pixels vs. Bandwidth
- Compression
- Image Quality loss ?

⇒ IQUAFLOW



- Huge Volume
- Compression
- AI Performance loss ?

⇒ IQUAFLOW



Diverse Comms

- Bandwidth
 - Latency
 - Cost
- ⇒ Edge AI / ML



RapidResponse image

on board (or not, very fast)

L3 Full pipeline

in the ground



Image Quality loss

Yes, but speed is paramount
for this use case



Precision loss ?

Segmentation
IQUAFLOW



Dataset

- Microsoft's footprints
- EU / USA
- L3 / RapidResponse
- 7200+ each - 66% Train
- Corrected annotations

Level L3

RapidResponse



New York

Berlin



Model

- 256x256 px crops
- UNet - FCN
- IQUAFLOW

Results

- Encouraging
- Fast

		Loss	IoU	F1-score	Precision	Recall
L3	NY	0.372 (0.020)	0.609 (0.013)	0.629 (0.020)	0.813 (0.009)	0.515 (0.027)
	Berlin	0.372 (0.022)	0.682 (0.012)	0.523 (0.020)	0.674 (0.015)	0.433 (0.028)
	Overall	0.387 (0.015)	0.658 (0.010)	0.613 (0.015)	0.787 (0.007)	0.513 (0.021)
RapidResponse	NY	0.362 (0.032)	0.611 (0.018)	0.638 (0.032)	0.782 (0.028)	0.543 (0.052)
	Berlin	0.413 (0.013)	0.709 (0.004)	0.565 (0.004)	0.604 (0.040)	0.543 (0.037)
	Overall	0.360 (0.012)	0.668 (0.012)	0.644 (0.012)	0.733 (0.032)	0.599 (0.043)

	Current	Next	NVIDIA 3090 RTX
6 crops batch	349 ms	99 ms	45 ms

Closing

- ▶ **Performance doesn't suffer**
What is "Image Quality"?
- ▶ **More experimentation**
Better performance, other use cases
- ▶ **Possible today**
For some use cases



A large satellite is shown in orbit above the Earth, with several smaller satellites trailing behind it. The Earth's surface is visible, showing clouds and landmasses. The background is the blackness of space.

SATELLOGIC[®]
NOW YOU SEE

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