



VoxelSensors

The Future of Spatial Computing

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Apple Vision Pro: Today's State-of-the-Art



Current personal devices are underperforming for the next tech revolution has begun!
mass consumer adoption.



Spatial Computing* devices
will fuel the next big computer revolution.
Current designs are underperforming
for mass consumer adoption.

A hand on the right side of the frame points towards a digital, wireframe-style hand on the left side. The digital hand is composed of glowing blue and red lines, representing a virtual or augmented reality interface. The background is dark with a subtle grid pattern.

We make Spatial Computing truly
immersive to unlock the full potential
of unbounded experiences.

* for clarity, we refer to Spatial Computing as the ability of devices to be Spatially Aware of their surroundings and to represent this digitally



Contextual Sensing is a Long-Standing Topic

Contextual Sensing is a key enabler for many crucial functions

- SLAM and general odometry for environment navigation (mobile, XR, robotics, automation)
- Object identification for virtual content occlusion and anchoring (mobile, XR)
- Hand and object tracking for interaction and manipulation (XR, robotics, automation)
- Segmentation, indexing and environment understanding (mobile, XR, robotics, automation)
- Biometric Authentication and Vital Signs (mobile, XR)



Contextual Sensing is a Long-Standing Topic

Major considerations for Mobile and XR, but also for robotics, etc.

1. Power efficiency



Lightweight wearable, decent battery life

2. Latency



No lag between system and real world

3. Accuracy



Quality of the data directly impacts quality of the function. E.g., in XR anchoring stability and correct virtual object dynamics

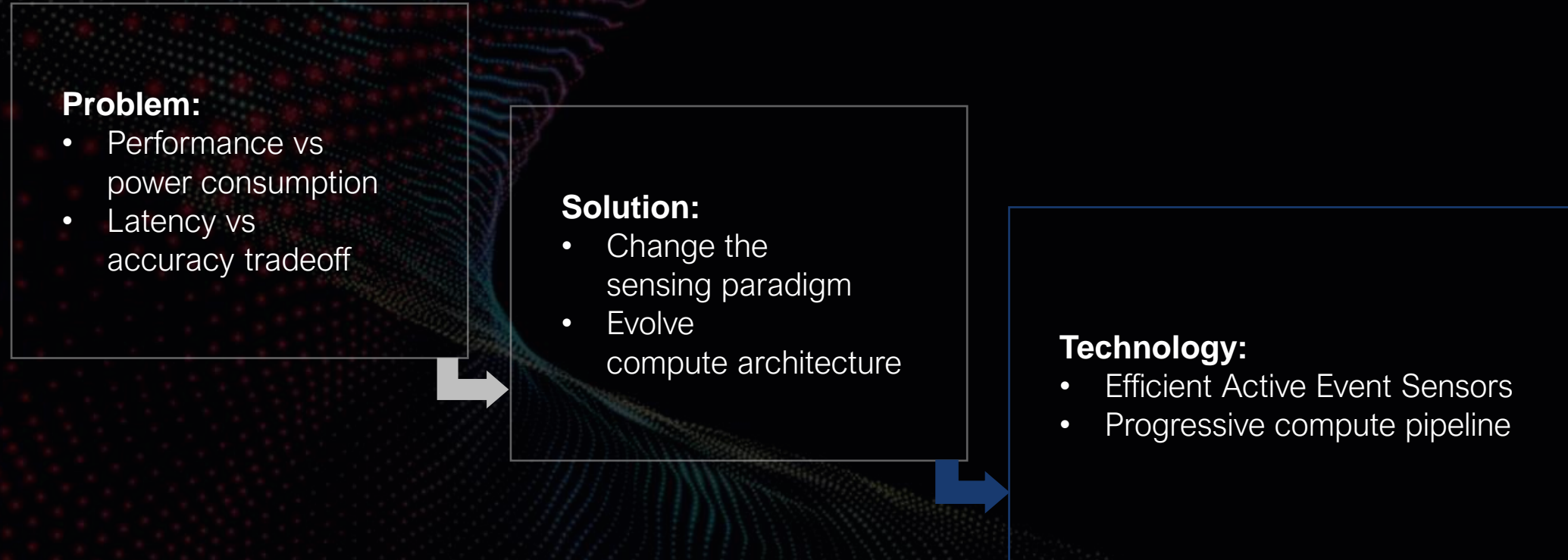
4. Robustness and durability



Working with other concurrent system;
Operation in any light condition [darkness and daylight]
Environment agnostic



The Key Message





VoxelSensors approach



VoxelSensors Approach

A new sensing technology for efficiently generating the new type of data.

- 1) Reduction of power & compute
- 2) Reduction of latency



Low-power, low-latency
sensing

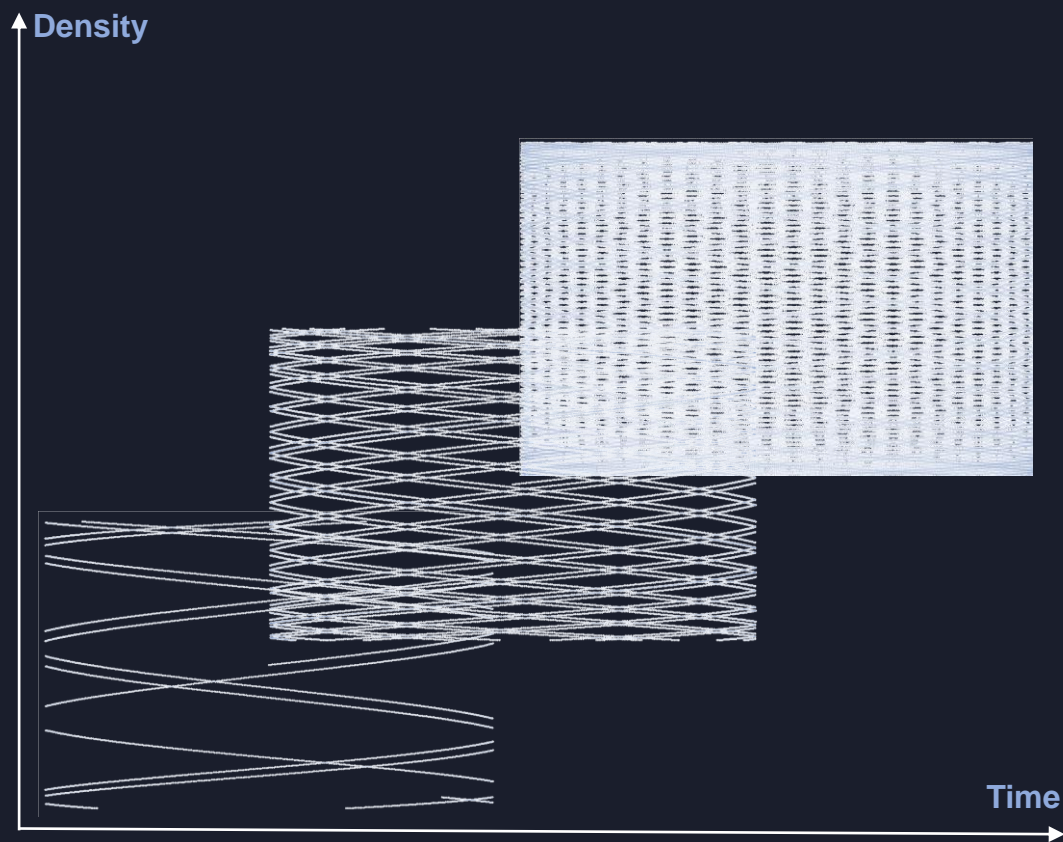
Low-power, low-latency, progressive
processing



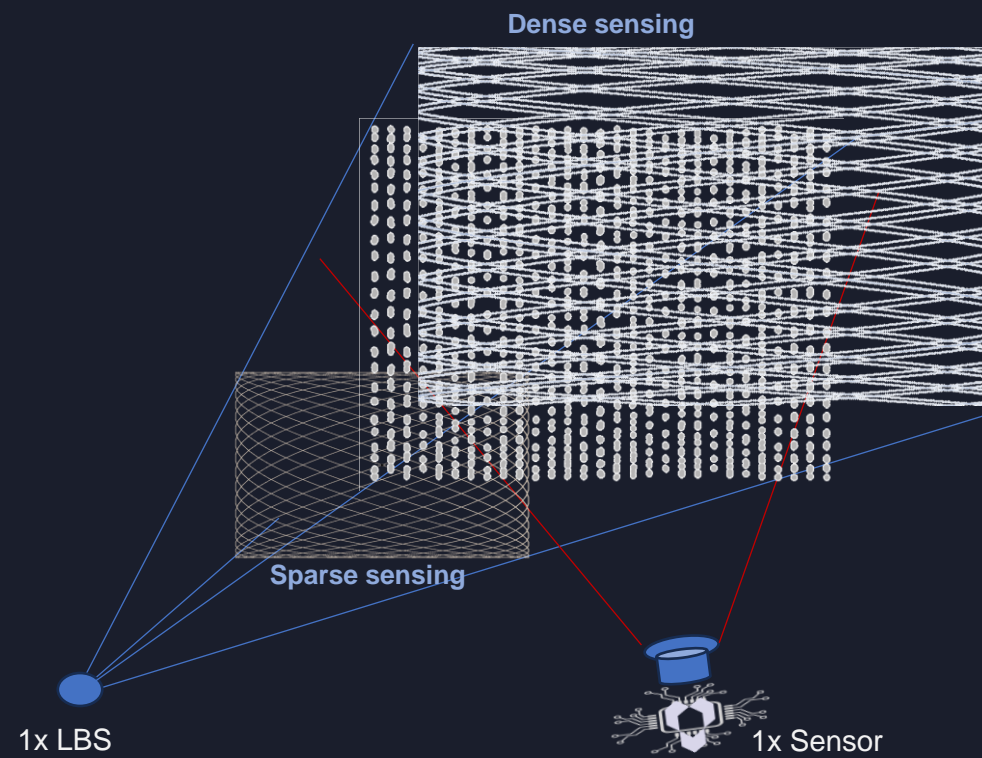
Patented Technology Fundamentals

Low-latency, low-power sensing

Density vs Time



Density vs Power

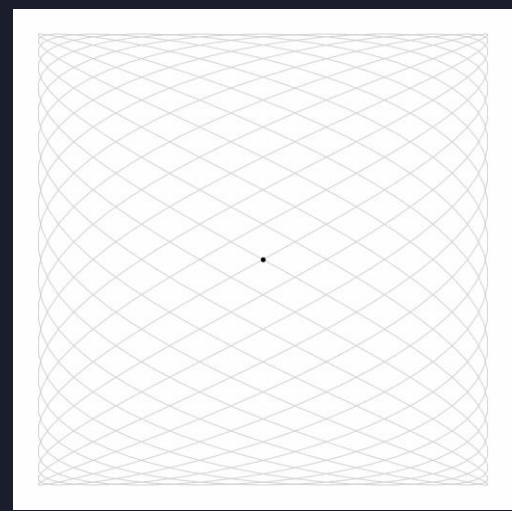




Patented Switching Pixels® Fundamentals

Laser Beam Scanner

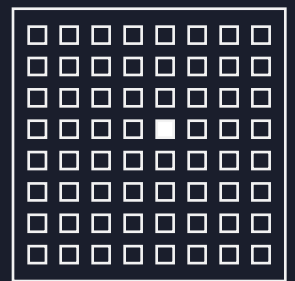
scans the world at high speed
(e.g., 2D MEMS mirror)



→ $S_1(x,y,t)$

Active Event Sensor

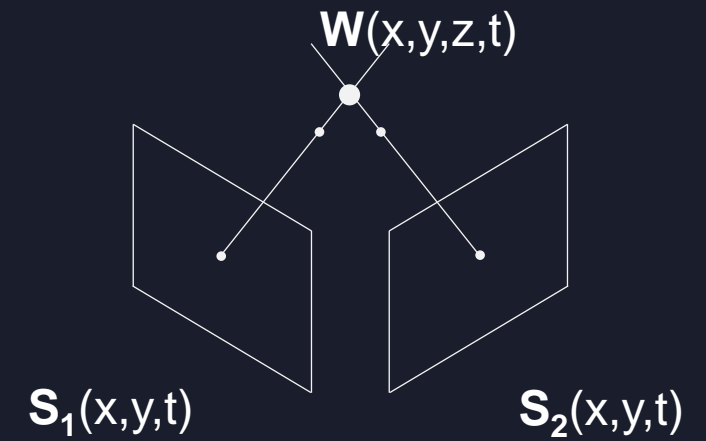
Single Photon Sensitive
Output: dot position (x,y,t)
Sample Rate: up to 100 MSps



→ $S_2(x,y,t)$

Serialized triangulation

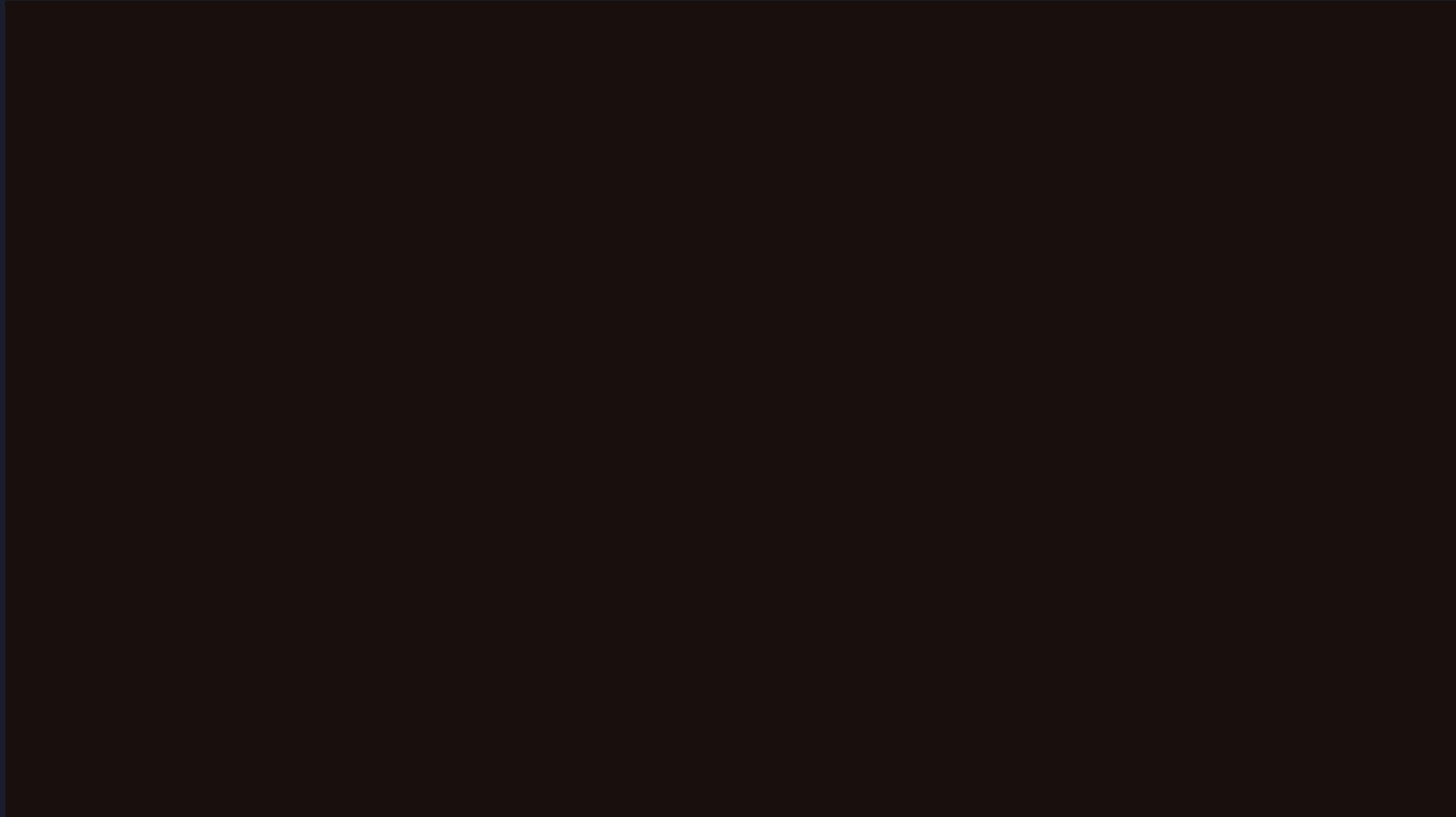
based on S_1 & S_2
generating a 3D datapoint at
up to 100 Mpts/s



→ $W(x,y,z,t)$



VoxelSensors progressive point cloud





Low-power, Low-latency Sensing

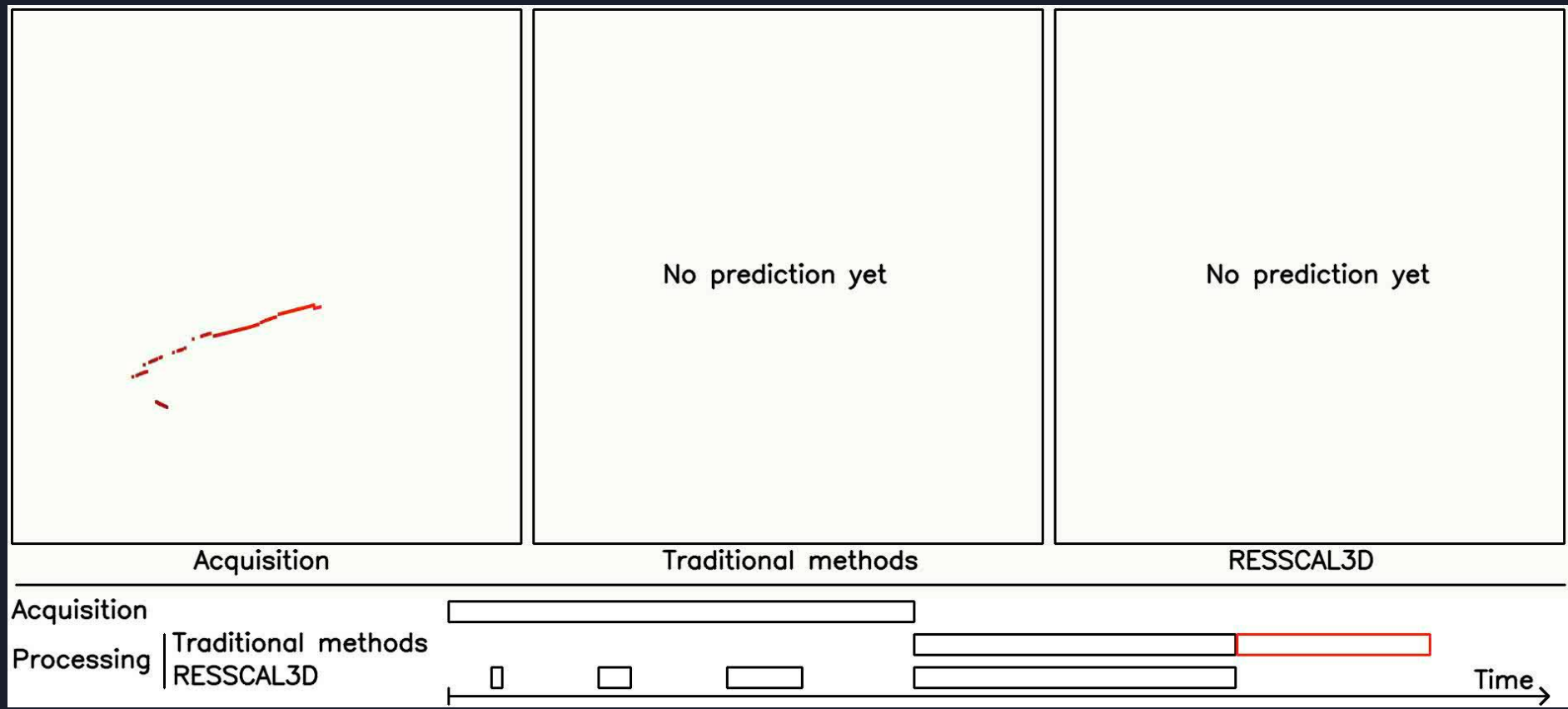
Data path #2

Single Photon Active Event Sensor
Work in progress (Dec 2023)



Low-power, Low-latency Sensing

RESSCAL3D: Resolution Scalable 3D Semantic Segmentation of Point Clouds
<https://ieeexplore.ieee.org/abstract/document/10222338>





Advanced Data Path Potential

- Due to the continuous nature of the signal streaming, we can get inline tessellation
- Object's spatial properties can be determined on the fly
- Sampling rate can assist in obliqueness of the objects
- Progressive polygon mesh due to Lissajous pattern



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Get in touch

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