PROPHESEE
METAVISION FOR MACHINES

ABOUT US

ABOUT US

PROPHESEE IN SHORT

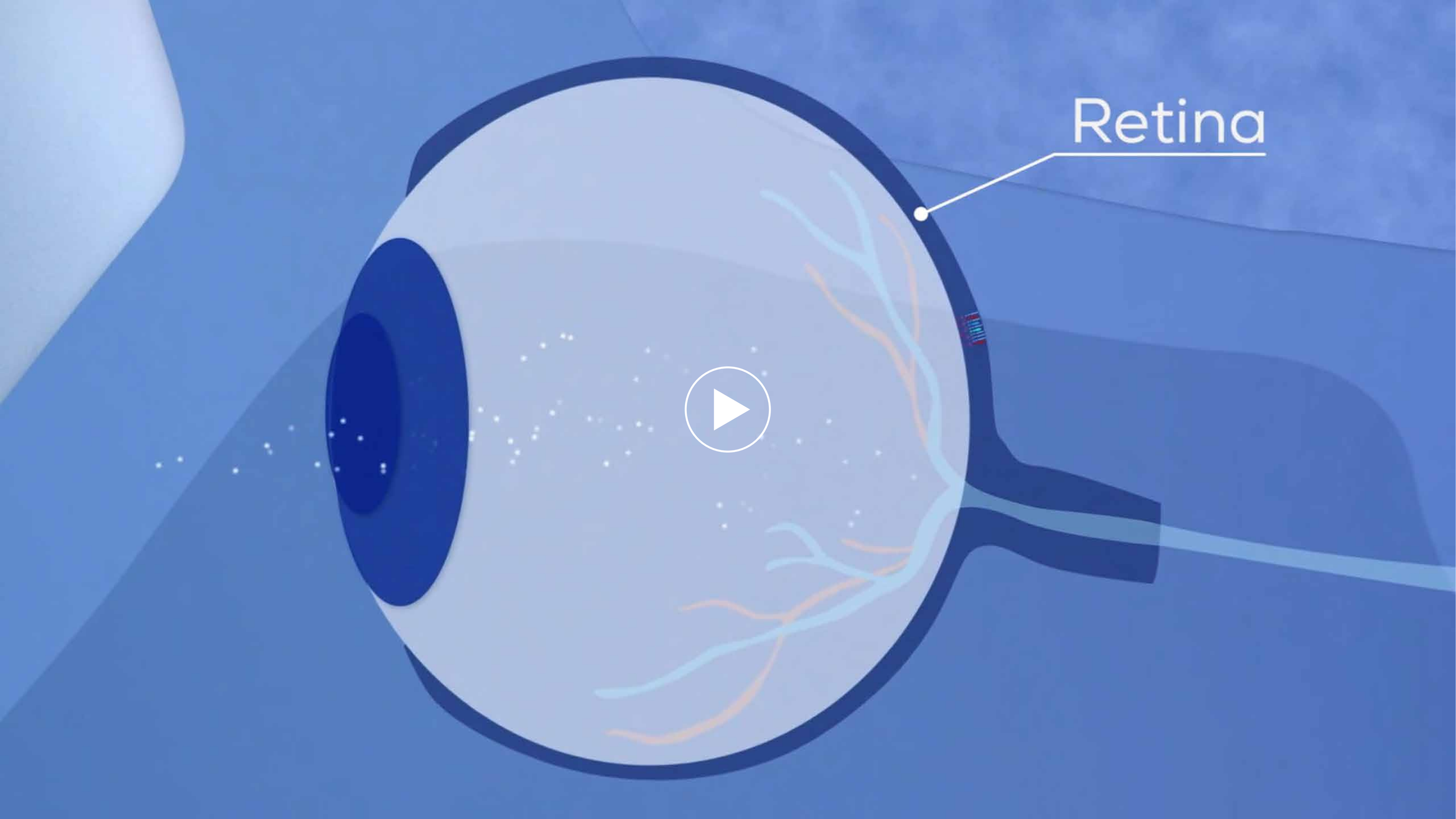
Prophesee is the inventor of the **world's most advanced neuromorphic vision systems.**

The company developed a breakthrough **Event-Based Vision approach to machine vision**. This new vision category allows for **significant reductions of power, latency and data processing requirements** to reveal what was invisible to traditional image-based sensors until now.

Prophesee's patented **Metavision® sensors and software suite** mimic how the human eye and brain work to dramatically improve efficiency in areas such as **industrial automation, mobile, IoT, security & surveillance, and AR/VR.**

Prophesee is based in Paris, with local offices in Grenoble, Shanghai, Tokyo and Silicon Valley. The company is driven by a team of **100+ visionary engineers**, holds more than **50 international patents** and is backed by leading international investors including **Sony, iBionext, 360 Capital Partners, Intel Capital, Robert Bosch Venture Capital, Supernova Invest, and European Investment Bank.**

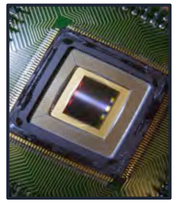
For more information visit: www.prophesee.ai


Retina

THE HISTORY OF PROPHESEE

2010-2011

FIRST ATIS SENSOR



FIRST PRODUCT

Pixium Vision

2013-2015

$5M FUNDRAISING

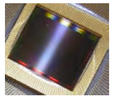
Chronocam

+20 patents in HW & SW

BOSCH Invented for life

SUPER NOVA INVEST

LAUNCH GEN 1
30µm QVGA



2016

$15M FUNDRAISING

BOSCH Invented for life

intel Capital

RENAULT NISSAN

360 CAPITAL PARTNERS

IBIONEXT

SUPER NOVA INVEST

TECHNOLOGY PIONEER

WORLD ECONOMIC FORUM

TOP 100 AI STARTUPS

CB INSIGHTS

COOL VENDOR

Gartner

TOP UP & COMING IMAGE SENSOR COMPANY

IS EUROPE AWARDS

Collaboration DARPA

2017

LAUNCH GEN 2
15µm HVGA

2018

$19M FUNDRAISING

PROPHESEE

+50 patents in HW & SW

TECHNOLOGY INNOVATION AWARD

ISSCC

MIT Technology Review

Vision Systems Innovators Awards 2018

AutoSens Awards

ASPENCORE EETimes

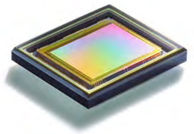
2019-2020

$28M FUNDRAISING

PROPHESEE | SONY

ANNOUNCED GEN 4
4.86µm STACKED HD SENSOR

LAUNCH GEN 3
15µm VGA PACKAGED



LAUNCH METAVISION INTELLIGENCE SOFTWARE

METAVISION INTELLIGENCE SUITE

FIRST INDUSTRIAL EMBEDDED SYSTEM

IMAGO | POWERED BY PROPHESEE

FIRST INDUSTRIAL USB SYSTEM

CenturyArks | POWERED BY PROPHESEE

ABOUT US

PROPHESEE

KEY FIGURES

2010
FIRST PRODUCT

51
PATENTS
SENSOR
SYSTEM
ALGORITHMS
APPLICATIONS

$68M
RAISED

37
INTERNATIONAL RECOGNITIONS

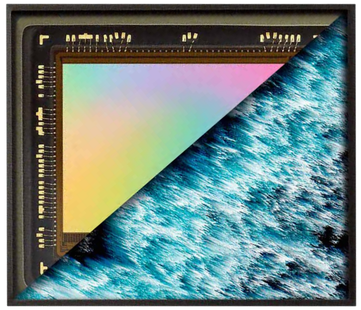
TEAM

100+
STRONG

5
OFFICES

PRODUCTS

METAVISION®
SENSORS



METAVISION®
INTELLIGENCE
SOFTWARE

DEVELOPMENT TOOLS

ECOSYSTEM

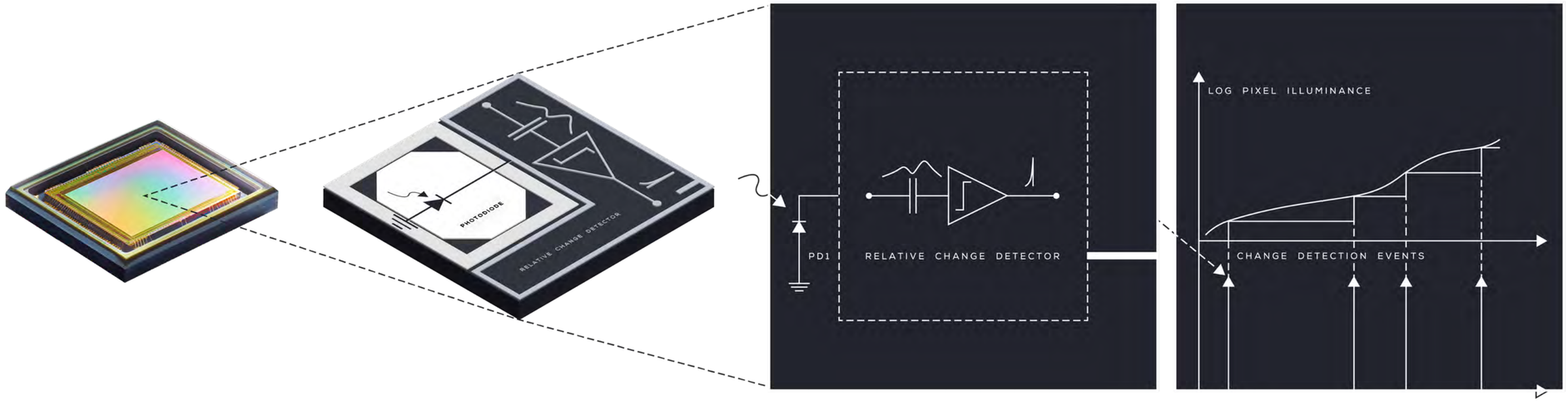
TECHNOLOGY

INTELLIGENCE, DOWN TO THE PIXEL

Each pixel in PROPHESEE Metavision® sensor

Detects intelligently when there is a change in the scene

And activates itself accordingly



THIS ALLOWS FOR

- ZERO REDUNDANCY SAMPLING
- PIXEL-INDIVIDUAL SAMPLING OPTIMIZATION
- TIME-DOMAIN EXPOSURE ENCODING

~~RAW DATA~~

ESSENTIAL INFORMATION

In a traditional Frame-Based sensor, the whole sensor array is triggered at a **pre-defined rhythm**, regardless of the actual scene's dynamics.

This leads to the acquisition of **large volumes of raw, undersampled or redundant, data.**

In Prophesee's patented Event-Based sensor, **each pixel intelligently activates** itself depending on the contrast change (movement) it detects.

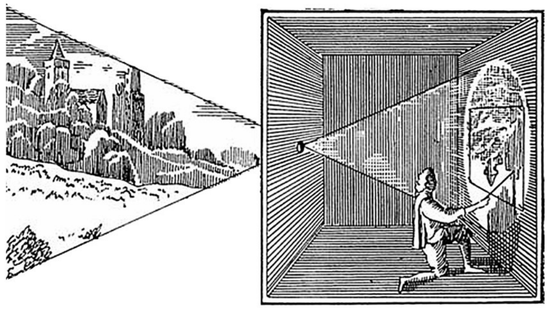
This enables the acquisition of only and all **essential motion information**, continuously, at the pixel level.

REVEALING THE INVISIBLE BETWEEN THE FRAMES

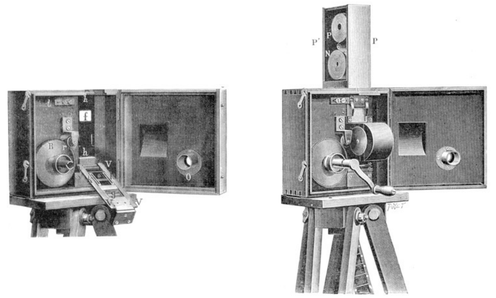
WE HAVE BEEN DOING THE SAME THING FOR CENTURIES

CAPTURE MOTION VIA STATIC REPRESENTATIONS

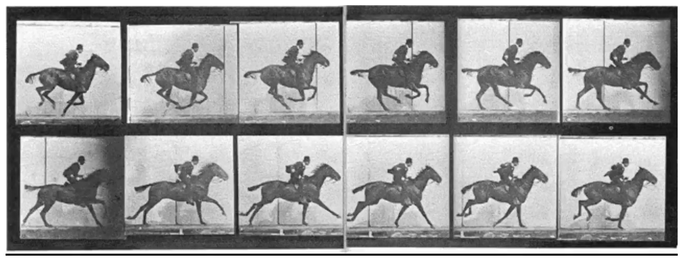
CAMERA OBSCURA



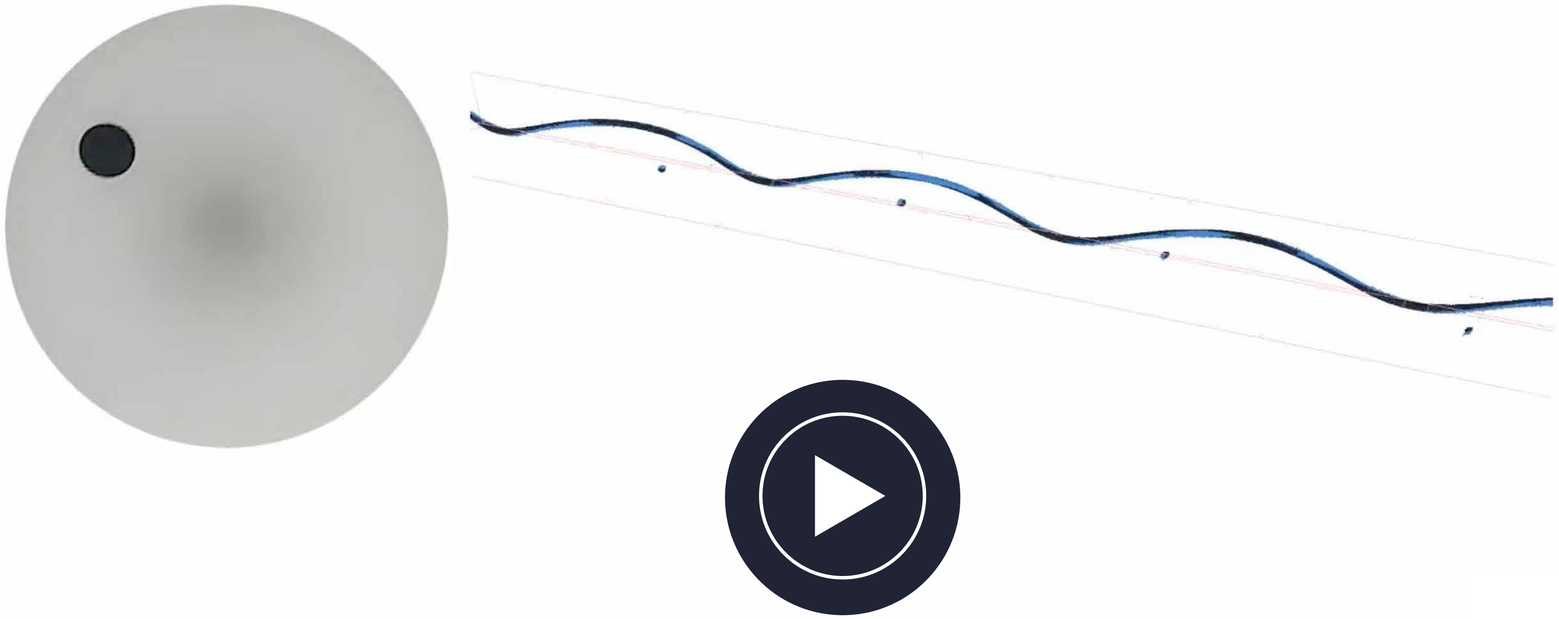
FRÈRES LUMIÈRE



SCUOLA DI ATENE – RAFFAELLO



EADWEARD MUYBRIDGE



On the LEFT, a simulation of **Frame-Based Vision** acquisition of a rotationg dot,

This approach leverages traditional cinema techniques and records a **succession of static images** to represent movement.

Between these images, there is nothing, **the system is blind, by design.**

On the RIGHT, the same scene recorded using **Event-Based Vision**.

There is no gap between the frames, because there are no frames anymore.

Instead, a continuous stream of essential information **dynamically driven by movement, pixel by pixel.**

THE HYPER FAST AND FLEETING

Events at **sub-millisecond** time scale.
10,000 fps equivalent

ONLY THE ESSENCE OF THE SCENE

10 to 1000 times less data processed in comparison to standard approaches.

THE HIDDEN BY EXTREME LIGHTING CONDITIONS

>120dB
wide dynamic range.

WITH UNPARALLELED POWER EFFICIENCY LEVELS

<10 mW

PROCESS AND PIXEL SIZE EVOLUTION

GEN 1

2015

GEN 2

2017

GEN 3

2019

GEN 4

2021

RESOLUTION

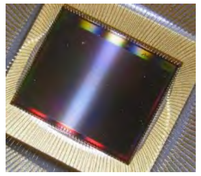
HD

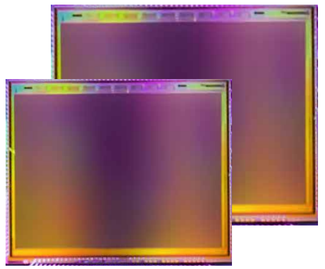
720p

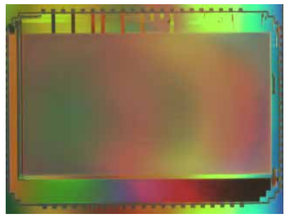
VGA

HVGA

QVGA



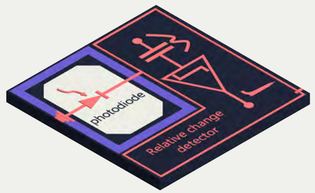




PIXEL SIZE

ATIS 30 µm
180nm CMOS

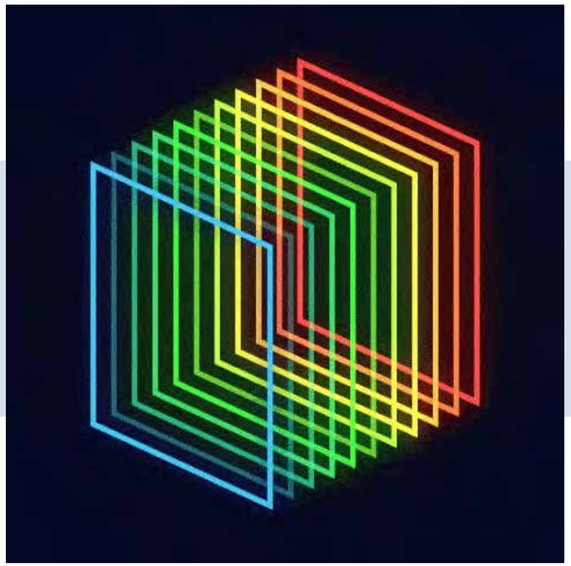
CD 15 µm
180nm CMOS



CD 15 µm
180nm CIS
25% fill factor

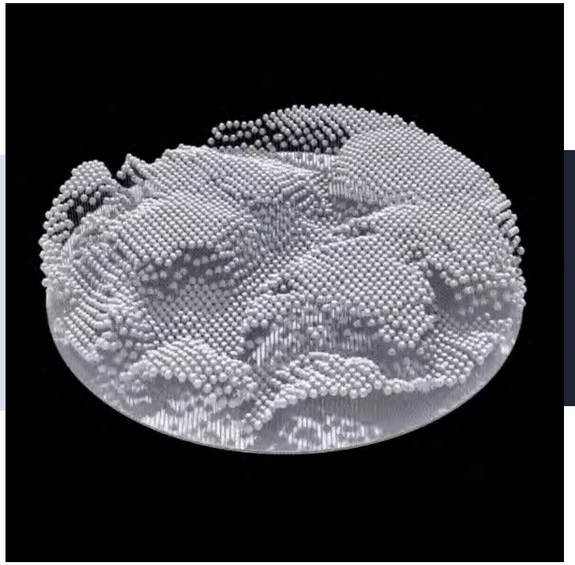
CD 4.86 µm
3D stacked
90nm CIS (BSI) on
36nm CMOS per-pixel
interconnects
80%+ fill factor

FRAMES VS EVENTS



FRAME-BASED

1. Generates **sequential** static pictures
2. **Clock-driven** (pre-defined frame rate)
3. Needs **exposure times**
4. **Fix amounts** of data
5. Beautiful pictures for **human consumption** (High-resolution, color…)



EVENT-BASED

1. Generates **continuous** events (asynchronous intelligent pixels)
2. **Scene-driven** (1µs time resolution - 10,000 fps equivalent)
3. **No exposure time** (120dB HDR / 40mlux low light sensitivity)
4. Amounts of data **vary with scene dynamics** (10x to 1000x less)
5. Efficient data for **machine vision** (pre-sorted at pixel level, fast, high robustness to challenging lighting conditions, motion-understanding capabilities by design).