

The logo for the 2024 embedded VISION SUMMIT is centered within a white octagonal shape. The octagon is surrounded by a colorful, multi-layered geometric border composed of overlapping triangles in shades of purple, blue, green, yellow, and orange. The text inside the octagon is arranged vertically: "2024" at the top, "embedded" below it, "VISION" in a large, bold, dark blue font with a gradient effect, and "SUMMIT" at the bottom in a smaller, dark blue font.

2024  
embedded  
**VISION**  
SUMMIT®

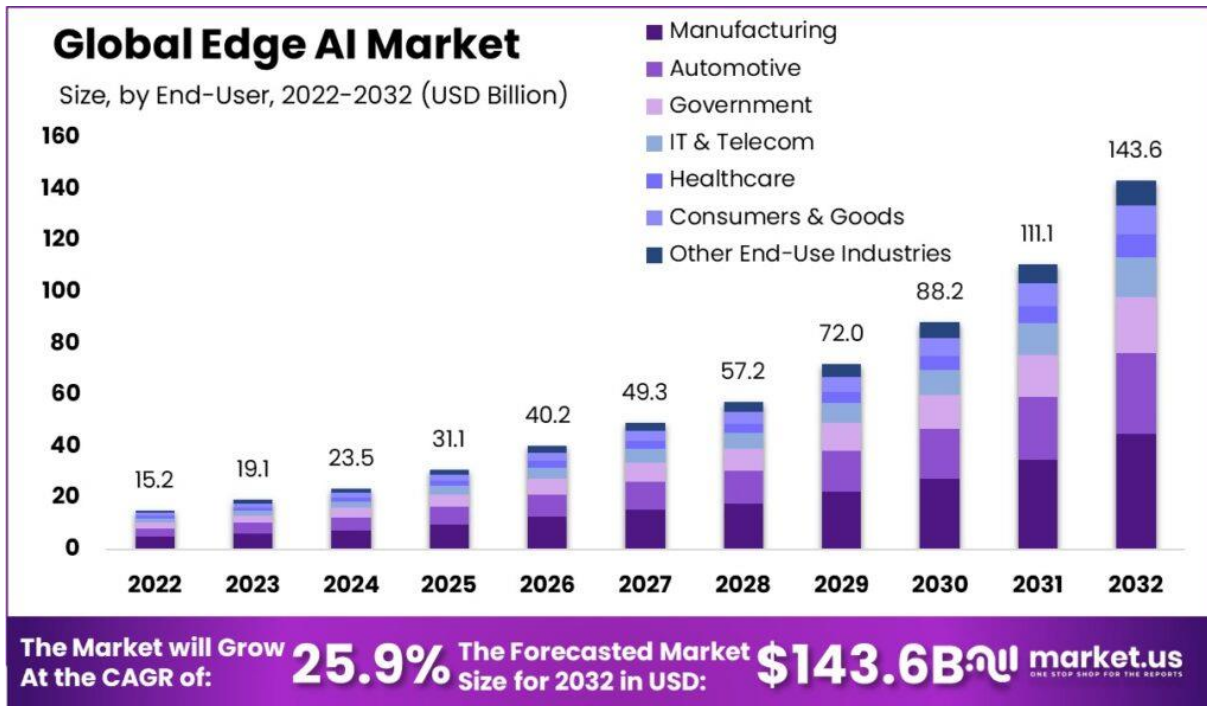
# Scaling Vision-Based Edge AI Solutions: From Prototype to Global Deployment

prof.dr. Maurits Kaptein

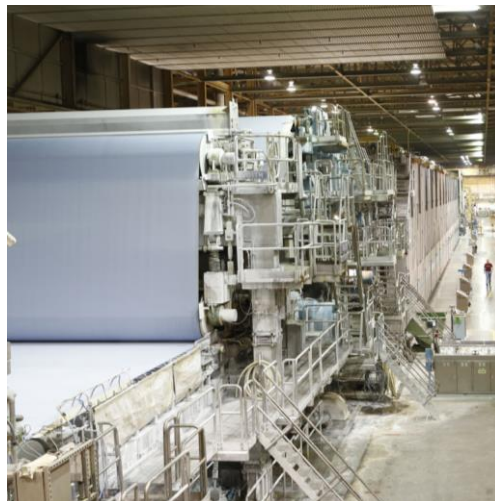
Chief Data Scientist

Network Optix

# The edge “Video+AI” revolution is just getting started



# Video+AI can be beneficial in virtually every vertical



However, as we all know, realizing solutions at scale is a challenge..

**60%**

“Hardware required  
is too costly.”

**57%**

“Development is too  
costly.”

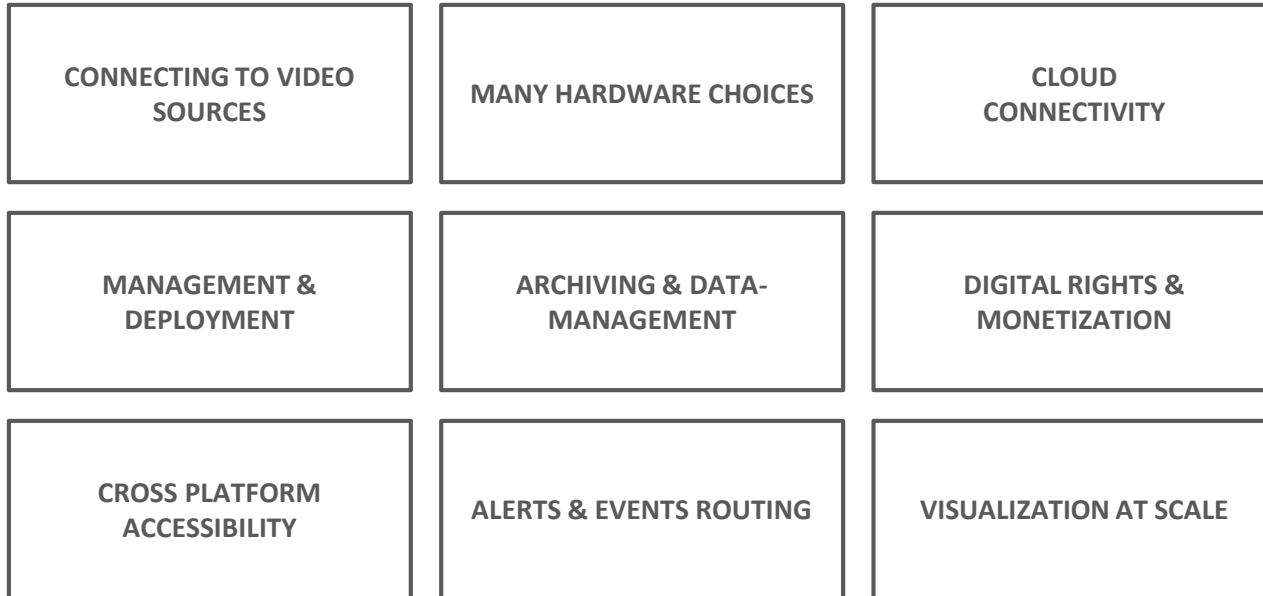
**57%**

“Hardware is too  
power hungry.”

Source: Edge AI and Vision Alliance, Computer Vision Developer Survey, November 2023

“In Situations Where You Would Like To Use Computer Vision/Perceptual AI But Are Not, What Is Preventing You?”

# Scaling video only solutions is a challenge in its own right



# Scaling Video+AI presents renewed challenges

## PIPELINE DEVELOPMENT

```
from pipeless_ai.lib.app import PipelessApp
from pipeless_ai.lib.logger import logger
import cv2

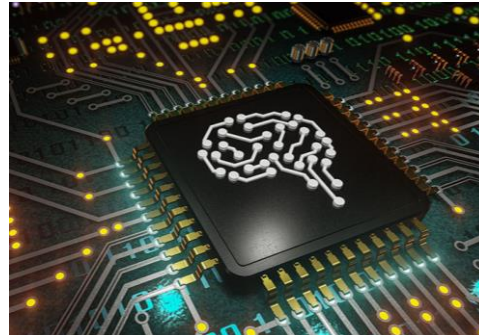
class App(PipelessApp):
    def before(self, ctx):
        xml_data = cv2.CascadeClassifier('cats.xml')
        ctx['xml_data'] = xml_data

    def process(self, frame, ctx):
        model = ctx['xml_data']
        bounding_boxes = model.detectMultiScale(frame, minSize = (30

        for box in bounding_boxes:
            a, b, width, height = box
            cv2.rectangle(frame, (a, b), (a + width, b + height), (2

        return frame
```

## AI ACCELERATION



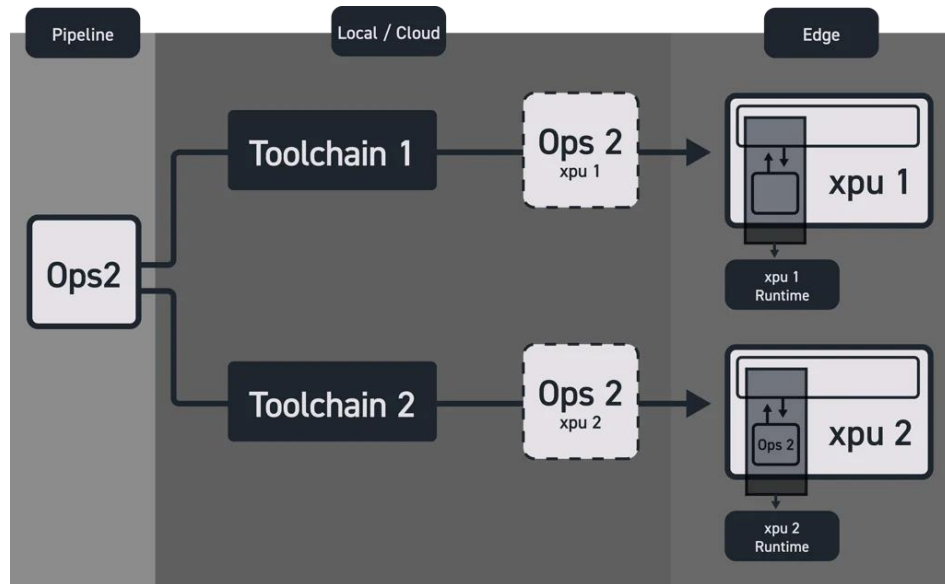
## INFERENCE MANAGEMENT

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# Standardizing the AI acceleration process: OAAX



- **Technology core:**
  - *Conversion* of the model's generic ONNX specification to a format that can run on the accelerator. The **OAAX toolchain**.
  - *Running* the specific model specification, i.e., generating inference. The **OAAX runtime**.
- **Organization:**
  - An open initiative (akin ONVIF) with the aim to build an accredited standard.
  - Starting first [focus groups](#) summer 2024.



# Contribute, visit, and join us!

## Nx toolkit for video+AI

Nx tools:

<https://www.networkoptix.com/nx-meta>

## OAAX standard

<https://oaax.org>

OAAX white-paper

<https://www.networkoptix.com/blog/2024/03/05/introducing-the-open-ai-accelerator-standard>

OAAX code examples and references:

<https://github.com/oaax-standard>

## 2024 Embedded Vision Summit

***Building and Scaling AI Applications with the Nx AI Manager***, Robert von Emden

Exhibit Hall—ET-1 Wed, May 22 at 2:40 pm

***Nx EVOS: A New Enterprise Operating System for Video and Visual AI***, Nathan Wheeler

Exhibit Hall—ET-2 Thur, May 23 at 12:00 pm

**Visit us at our booth — Booth #304**



# Questions and Answers



**Maurits Kaptein**  
*Network Optix and  
University of Eindhoven*

**Text your questions to +1 408-400-2702**

