



SIEMENS

Siemens Advanta

## AUGMENTED MACHINE VISION

Data enablement to unearth the  
value of digitalization  
- not only for brownfield shopfloors



## THE CHALLENGE

Brownfield manufacturing assets rarely are ideal candidates for digitalization. Bringing legacy machinery into the age of IoT often means prohibitive investments, complex development work, technical risks, and challenges to production stability as necessary modifications often result in loss of production and downtimes. Consequently, valuable data from machines, devices, and operations remain unseen and unused, excluding brownfield assets from benefiting from digitalization.



ENABLE BROWNFIELD  
ASSETS



IMPROVE QUALITY



INCREASE  
TRANSPARENCY



OPTIMIZE THROUGHPUT  
PROCESS

## OUR SOLUTION: DIGITIZING BROWN-FIELD ASSETS WITH SMART CAMERAS

Augmented Machine Vision (AMV) by Siemens Advanta allows retroactive digitization of legacy tools and systems with a simple, non-invasive integration into the existing infrastructure. Adding a data layer in this way enables brownfield environments to benefit from digitalization.

### A NON-INVASIVE, ADAPTABLE SOLUTION ENABLING VARIOUS AREAS OF APPLICATION

Augmented Machine Vision (AMV) allows digital enablement for plants where no sensor is available, enabling the provision and interpretation of all observable brownfield data:



### PREDICTIVE PROCESS



Boost the quality and performance of processes with predictive data models

### SELF LEARNING SYSTEMS



Expand capabilities of systems like machines or robots by using virtual feedback

### VISUAL INSPECTION



Automate quality assurance by autonomous object analysis

### LOCALIZATION



Reduce search time and find relevant material and assets area-wide



## QUALITY INSPECTION WITH AMV

### THE CHALLENGE

Identification of multiple defects in drinking cans

### OUR APPROACH

Solving the problem with use of Deep Convolution Network to visually identify damages on cans  
The model not only gives the probability of a defect being present, it also identifies and localizes it

### OUR IMPACT

In case of damages, the model identifies the exact locations, convincing it to declare the product as defective. On previously unseen test data, the model gives an accuracy of around

**90%**

## AUTOMATIC UNIFIED RECOGNITION USING ATTENTION

### THE CHALLENGE

Read characters and extract information or identify defects on manufactured parts.

### OUR APPROACH

Using a multi-staged process which includes attention, geometric correction, text

region detection, adversarial training and a finally weighted mixture of experts custom deep learning pipeline running on CPU and GPU (distributed computing)

### OUR IMPACT

Increase in precision from

**8% to 95%+**



## LET YOUR MANUFACTURING ASSETS TAKE THEIR NEXT STEPS TOWARDS A DIGITAL FUTURE

**Invest in the future:** Changes in your assets can easily be adapted in AMV

**Enable Digitalization:** Access digital value-added services for your brown field production

**Reduce costs:** Work can be done more efficiently by providing assistance at manual process steps

**Scale up:** Add new cameras as your assets grow

**Increase quality:** Handle high quality-demands with automatic quality inspection

**Increase Transparency:** By tracking material and workflows, bottlenecks can be discovered

# WHY AUGMENTED MACHINE VISION WITH SIEMENS ADVANTA?

## THE SIEMENS ADVANTA APPROACH

- allows cost-effective, noninvasive integration into existing brownfield machinery, and
- offers an easy way to modernize and digitize legacy equipment.

## AUGMENTED MACHINE VISION ENABLES PROCESS OPTIMIZATION THROUGH

- effective detection of multiple types of defects on different types of objects in diverse scenarios and environments, and
- scalable high-quality results in milliseconds through the use of high-performance computing.

We provide a unique combination of IT/OT competence, digital transformation experience, as well as extensive domain know-how.

### Get in touch

Leverage our capabilities, infrastructure and domain expertise to obtain the technology solutions you need to integrate the digital transformation and remain competitive and proactive.

Business request:  
[advanta@siemens.com](mailto:advanta@siemens.com)

### About Siemens Advanta

We provide end-to-end IoT solutions and create your unique digital journey - from consulting to design and implementation.

Offering unmatched industrial DNA paired with strong IoT experience to drive sustainable growth in a digital world, we support you globally to successfully re-invent your business.

For more, visit [www.siemens-advanta.com](http://www.siemens-advanta.com)