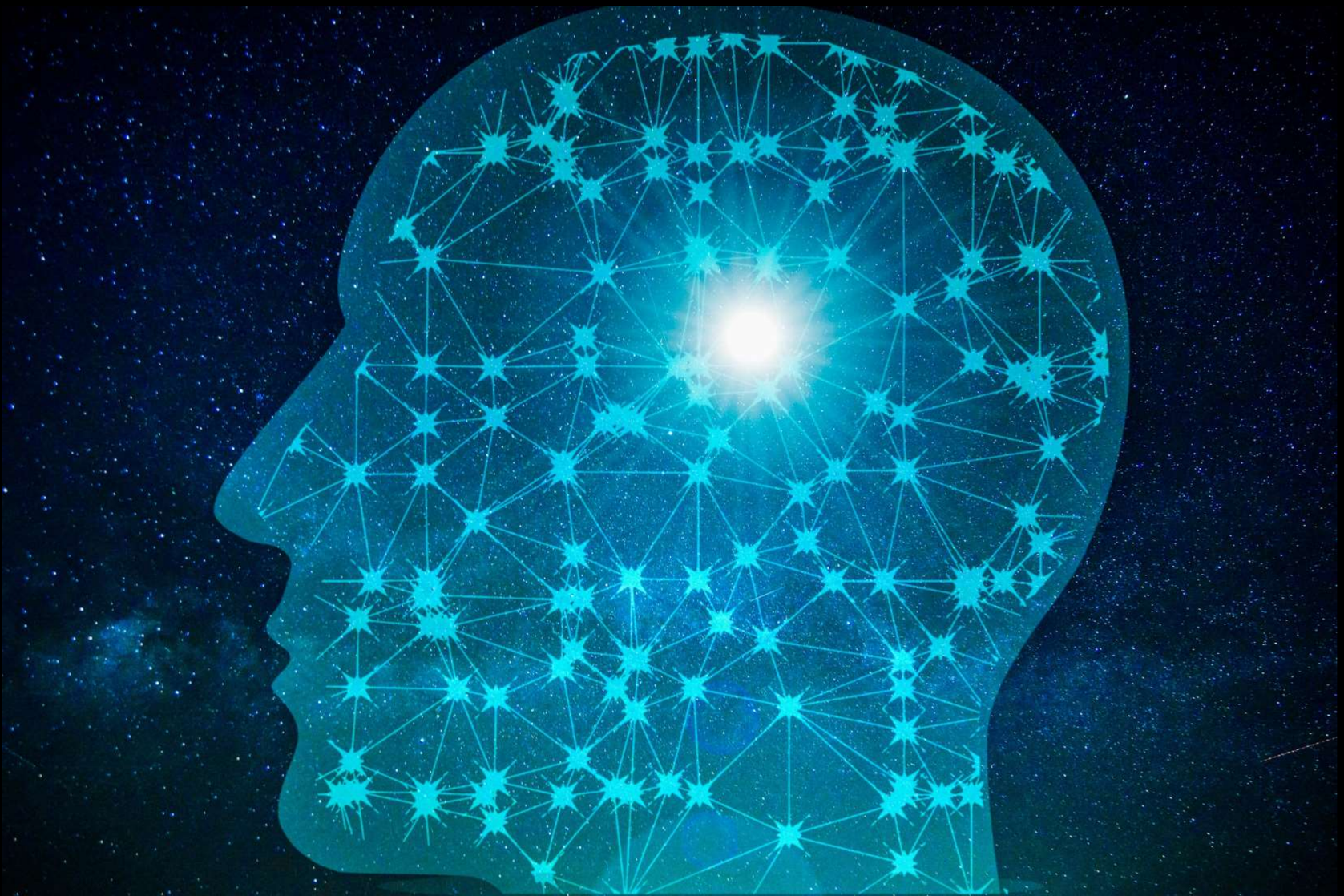
FME AI FOR INDUSTRY JAAREVENT

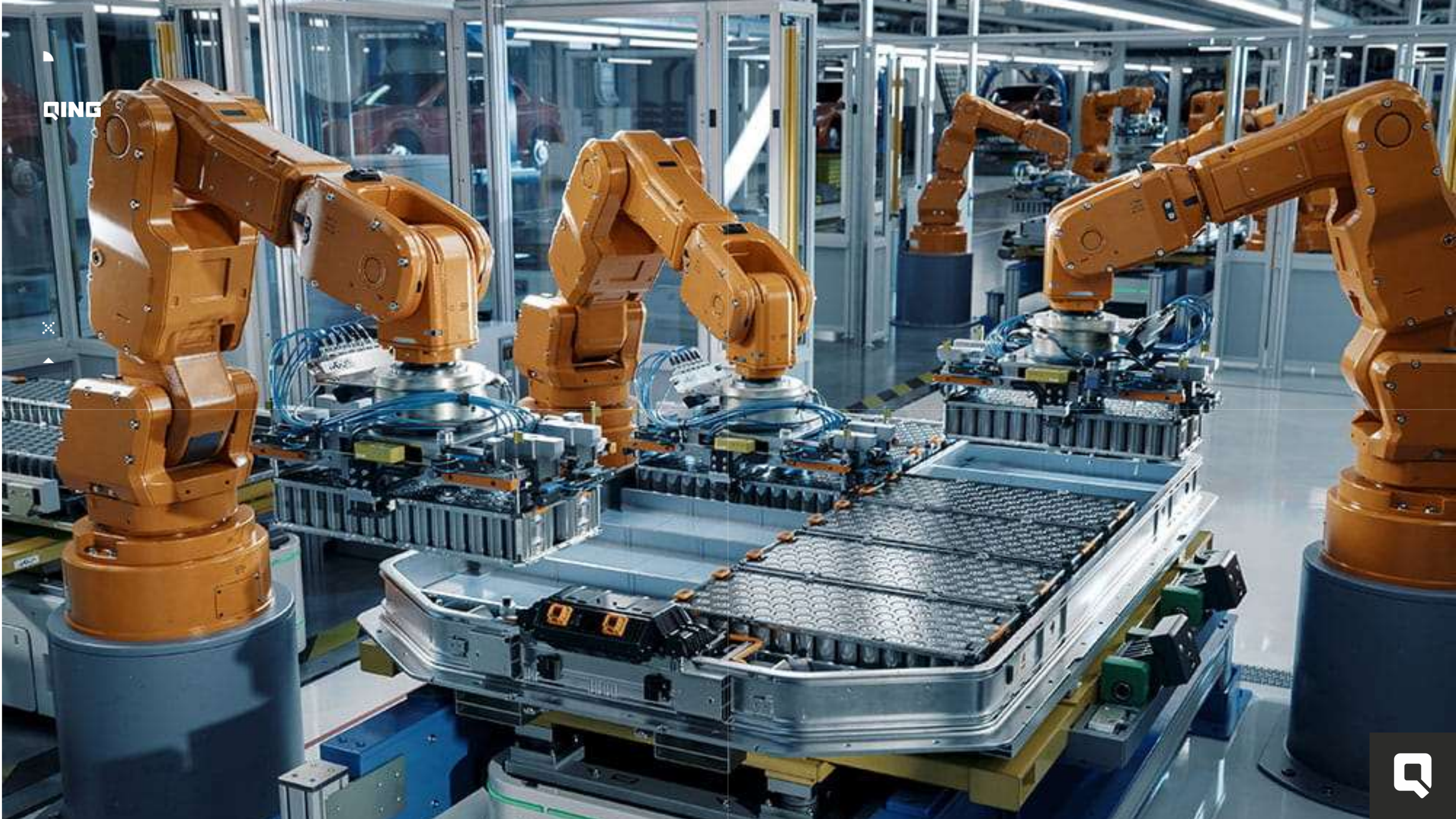


AI en Robotica:

De nieuwe norm in automatisering omarmt diversiteit

QING

FME POWERED BY DUTCH TECHNOLOGY



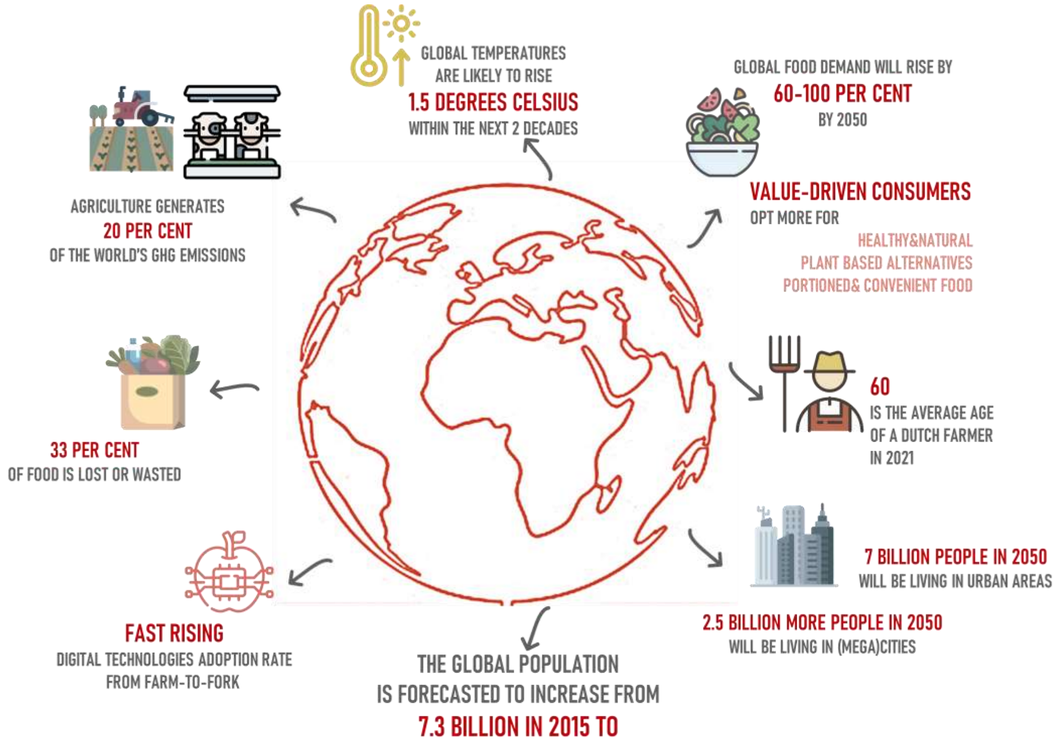
QING
FOOD AUTOMATION
=
DEALING WITH DIVERSITY
“THIS IMAGE IS GENERATED BY AI”

QING
PRODUCT
• Shape
• Color
• Rigidness
• …
DEVIATION
• Defects (cuts, breaks, etc.)
• Mold
• Appearance
• …
CLIENT REQUIREMENTS
• Quality
• Packaging
• Size
• …
DIVERSITY
IN-EFFICIENCY
WASTE
ACTIONS
• SORTING
• PICKING
• GRADING
• CUTTING
• MANIPULATING
• PACKING
• ASSEMBLING
• …

PURPOSE IS QING

MAIN CHALLENGES IN FOOD

- GROWING SHORTAGE MANUAL LABOR, EXPERIENCE AND EXPERTISE
- GLOBAL SUSTAINABILITY GOALS [SDG]
- DEALING WITH QUALITY AND DIVERSITY

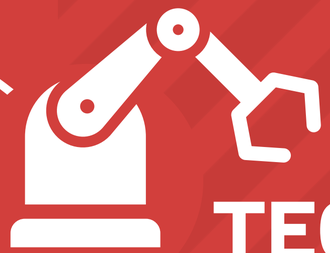


THIS IS NOT POSSIBLE WITHOUT TECHNOLOGY

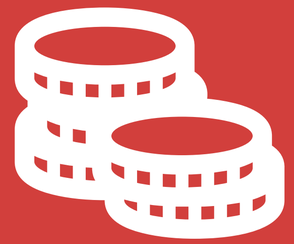
SOLUTIONS FOR THE BIGGEST CHALLENGES IN FOOD

3 ELEMENTS FOR A SUCCESFULL INNOVATION STRATEGY

SUPPORT
BASE
TRAINING



TECHNOLOGY

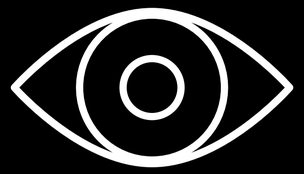


BUSINESSCASE
COST + VALUE

QING

STAQ

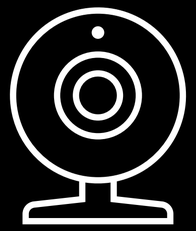
Introducing STAQ: The Future of Food Automation

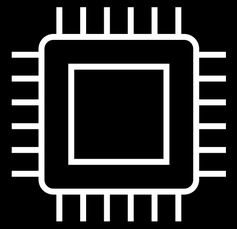


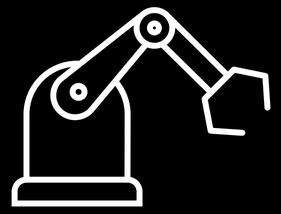
SEE

THINK

ACT

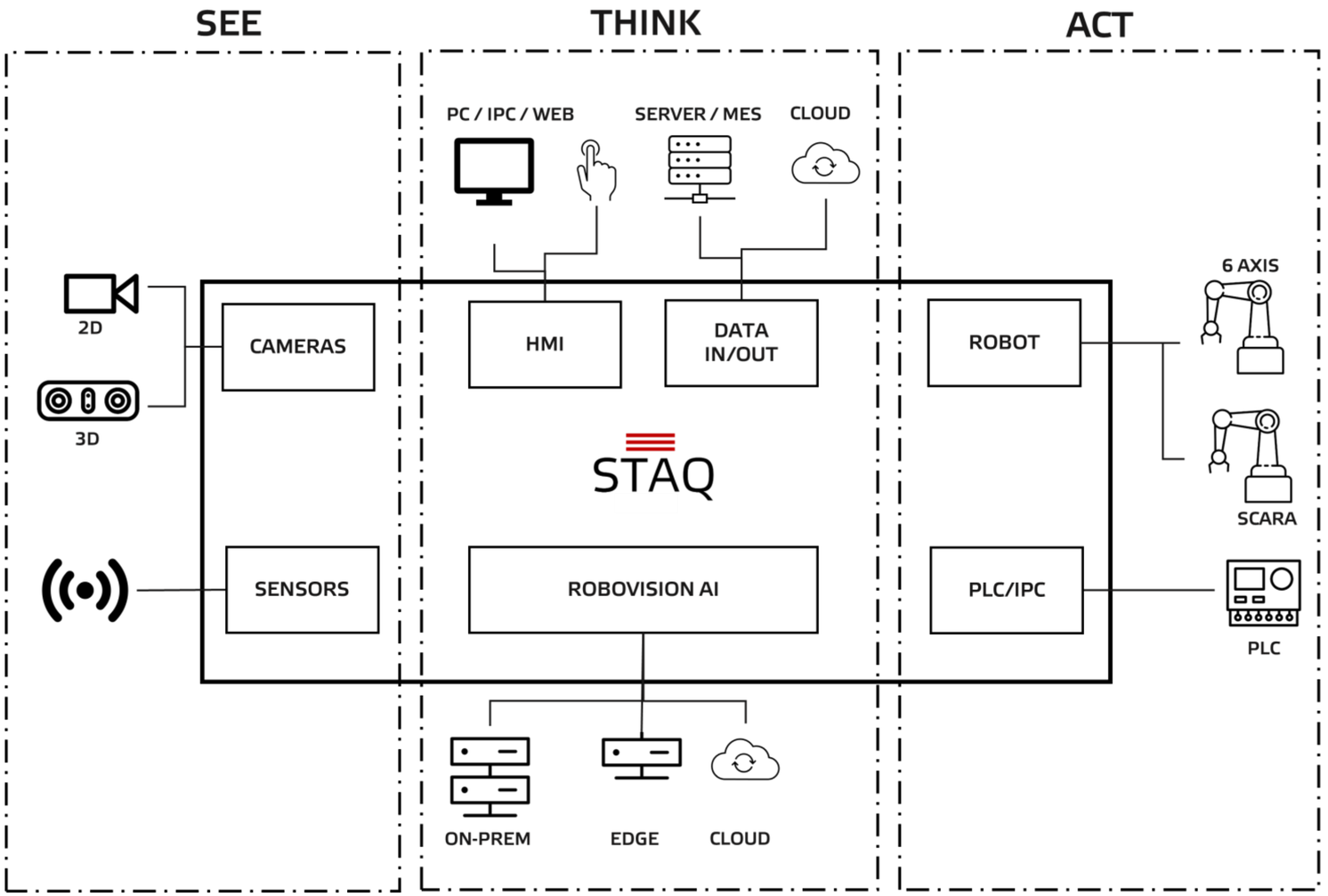




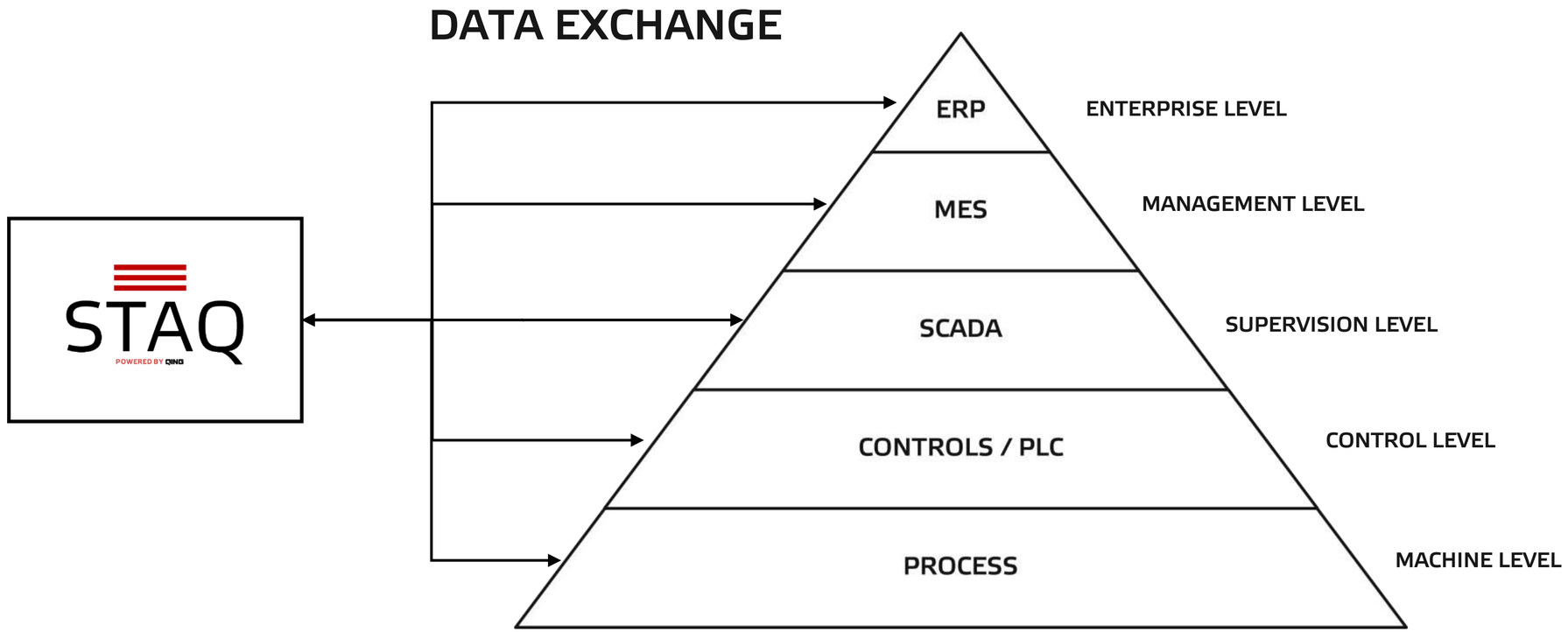


HIGH LEVEL FRAMEWORK VISUAL

- Benefits
  - Realtime PLC behavior
  - Flexibility high level programming
- Easy to integrate
- Robust and secure
- Always up to date with latest specifications
- Easy to use
- Scalable



VARIOUS LEVELS OF INTEGRATION



- Data exchange on various levels
- Less paperwork and less chances of human error
- Actually apply the potential of data that is already available
- Start small, scale fast

CURRENT SOLUTION TYPES

STAQ

QUALITY CONTROL

SEE THINK

QUALITY CONTROL
DEFECT CLASSIFICATION
GRADING

SORTING PACKING/PICKING

SEE THINK ACT

QC + SORTING
QC + PACKING

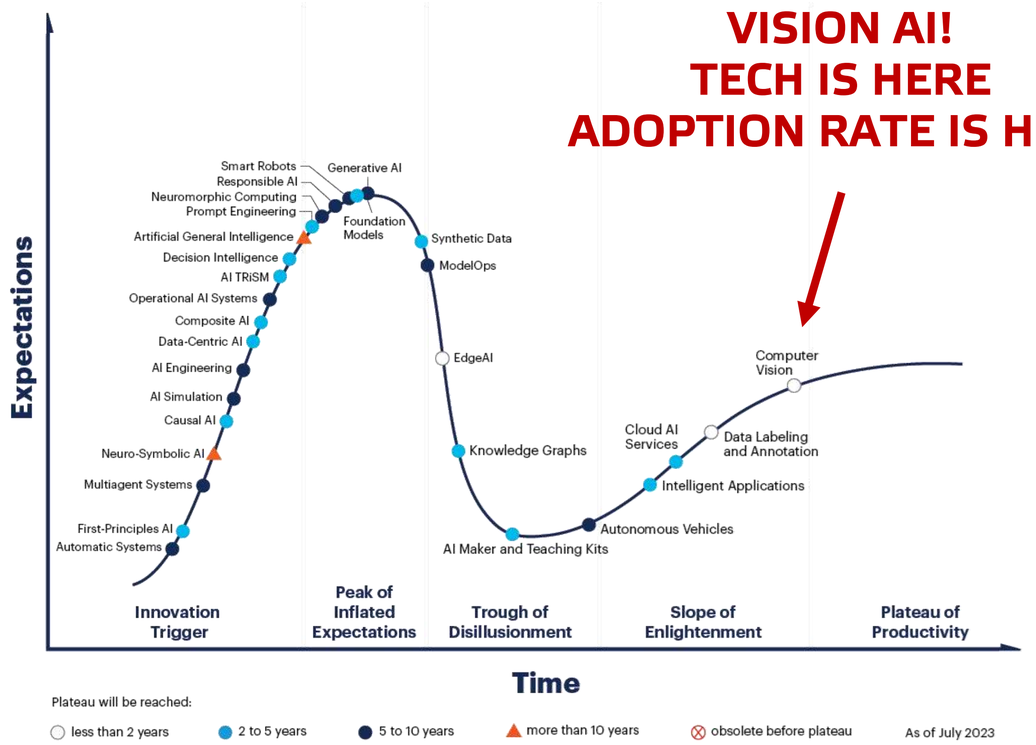
PROCESSING

SEE THINK ACT

AUTOMATED CUTTING
AUTOMATED SLICING

HYPE CYCLE FOR ARTIFICIAL INTELLIGENCE

VISION AI!
TECH IS HERE
ADOPTION RATE IS HIGH



gartner.com

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Gartner

VISION IS EVERYTHING THAT GENERATES AN IMAGE

- RGB 2D CAMERA
- 3D – STEREO CAMERA
- RADAR
- LIDAR
- NIR (NEAR INFRARED)
- X-RAY
- MULTI- HYPERSPECTRAL

THIS OPENS UP A LOT OF POTENTIAL APPLICATIONS
IN FOOD PROCESSING!

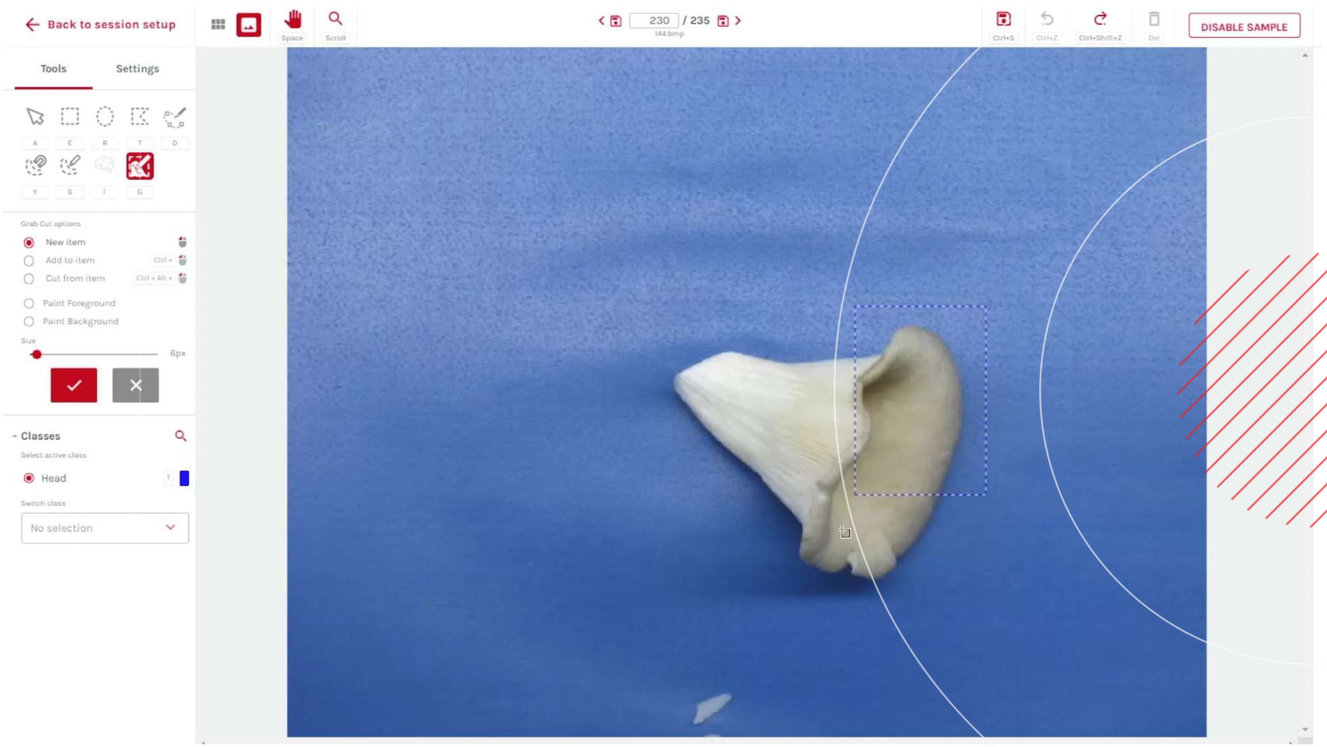
TRADITIONAL VISION VS. VISION AI
PROGAMMING VS. TEACHING

```
def check_db():
    if not os.path.isfile(FILE_URI):
        db.create_all()

@app.route("/")
def home():
    check_db()
    all_books = db.session.query(Book).all()
    return render_template("index.html", books=all_books)

@app.route("/edit", methods=["GET","POST"])
def edit():

    if request.method == 'POST':
        book_id = request.form["id"]
        book_to_update = Book.query.get(book_id)
        book_to_update.rating = request.form["rating"]
        db.session.commit()
        return redirect(url_for('home'))
```



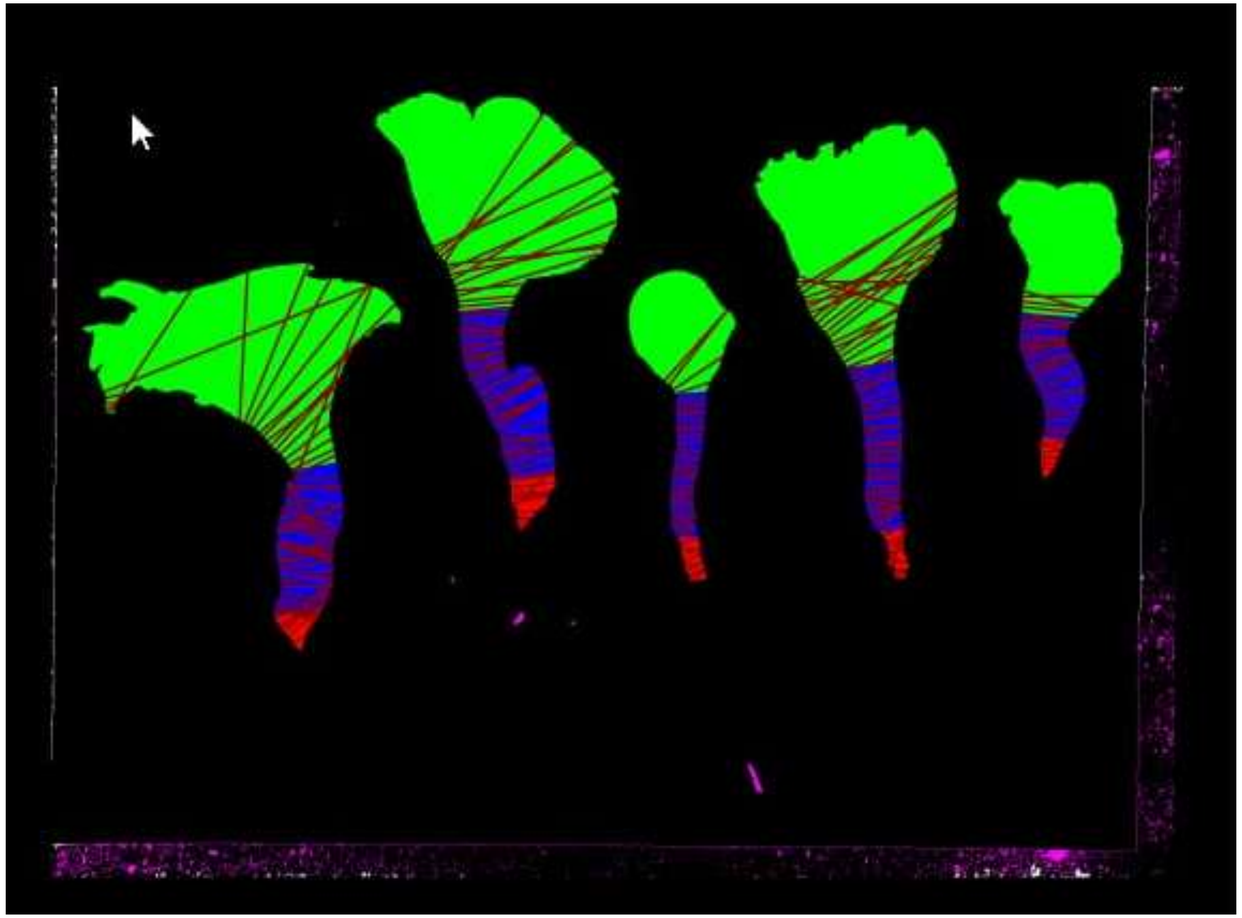
- You need software engineering skills
- Takes time
- Hard to modify and improve

- You can do it
- Takes minutes
- Easy to improve

ROBOVISION

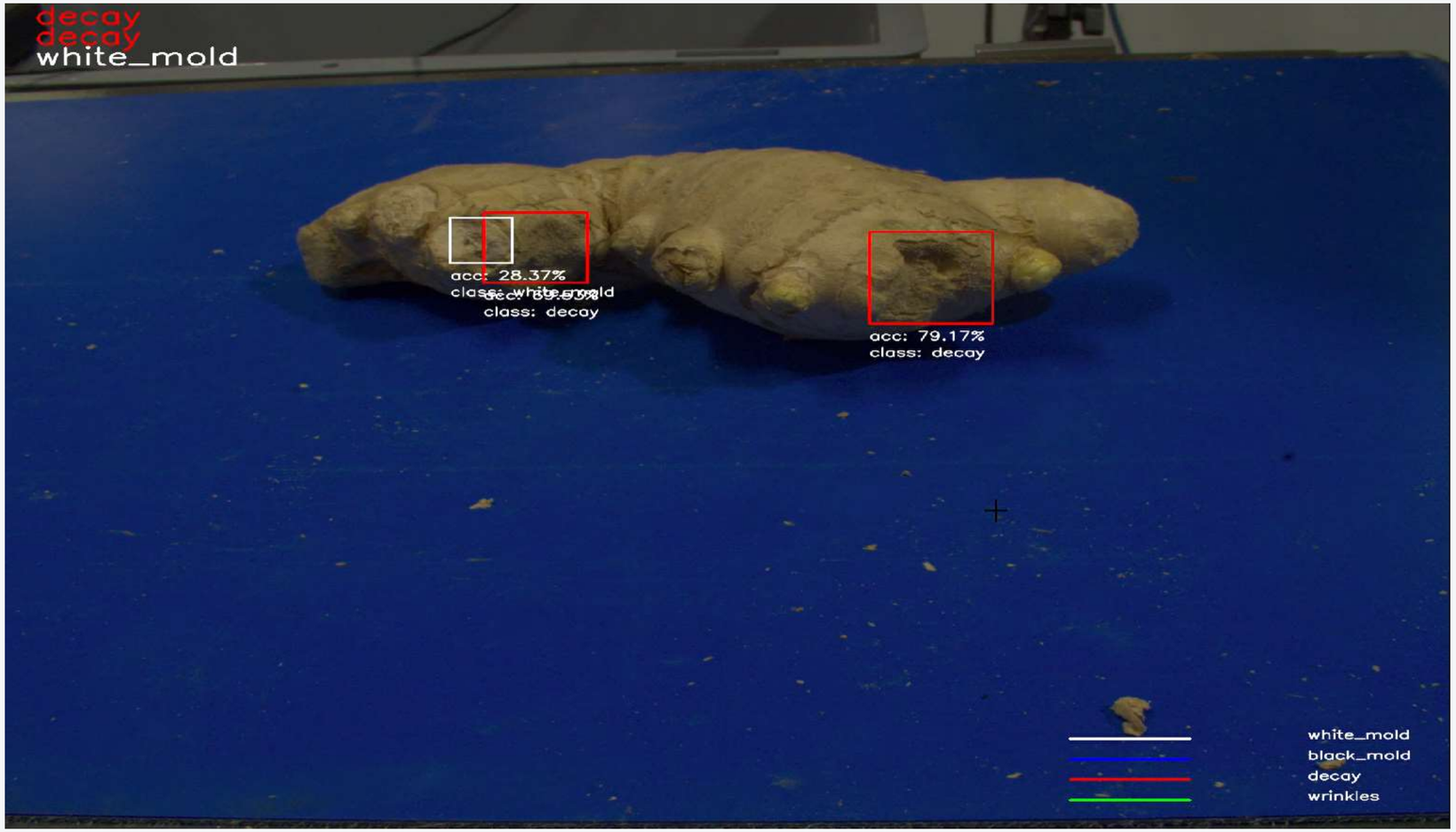
TRADITIONAL VISION VS. VISION AI

QING



- Controlled conditions needed
- Not that accurate and reliable

SUBJECTIVE -> OBJECTIVE

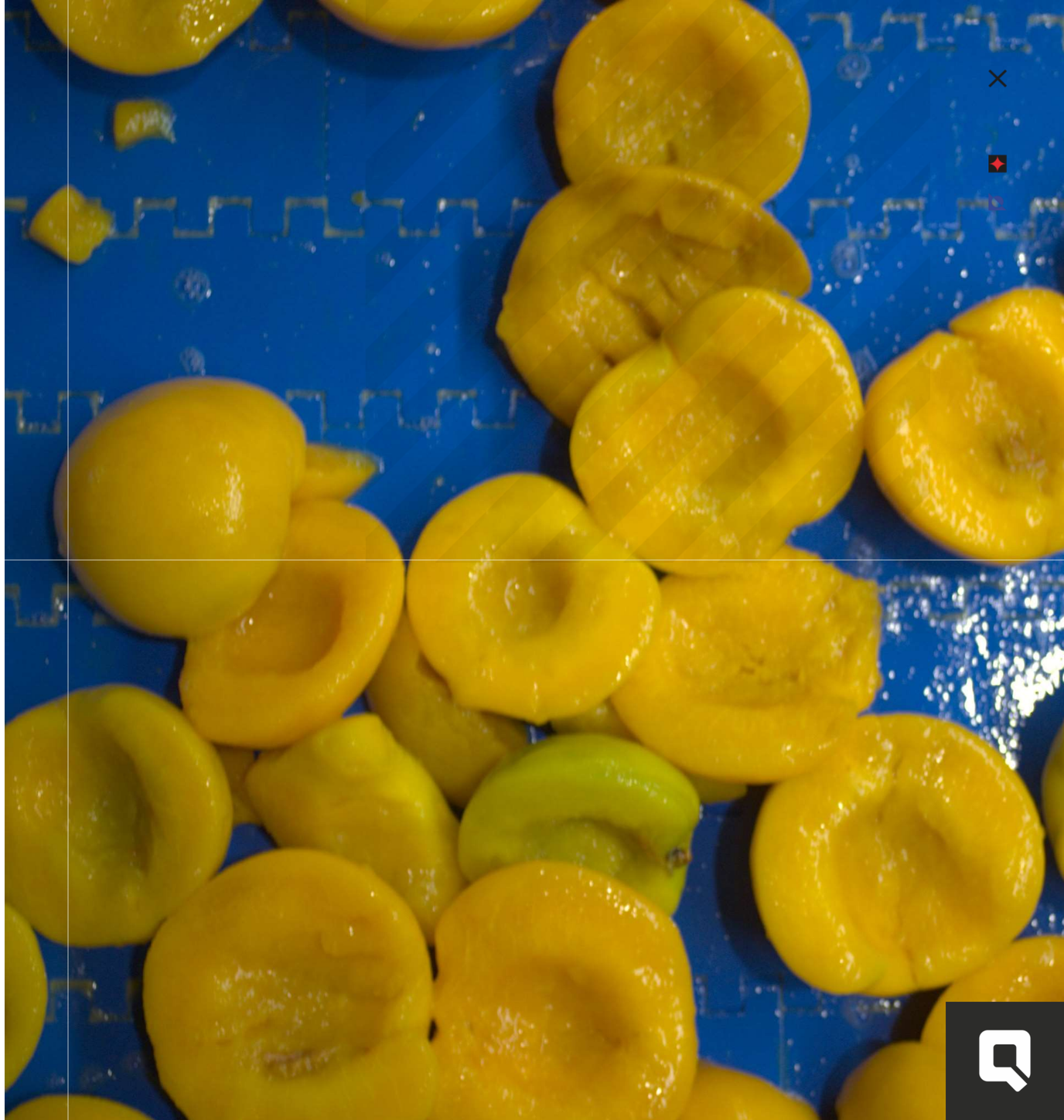


- Objective and reliable -> Less claims
- In control of value -> higher revenue
- Insights and data that can be used for further optimization -> cost reduction

QING

AGRO PHOENIX
SUPERIOR FRUIT PRODUCTS

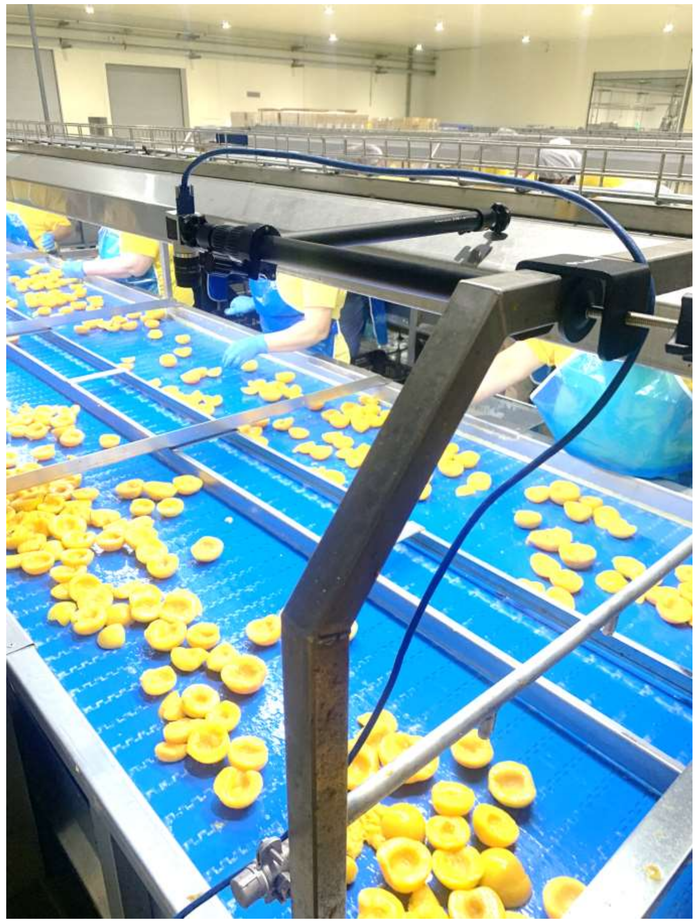
MAXIMUM VALUE OUT OF HARVEST WITH STAQ



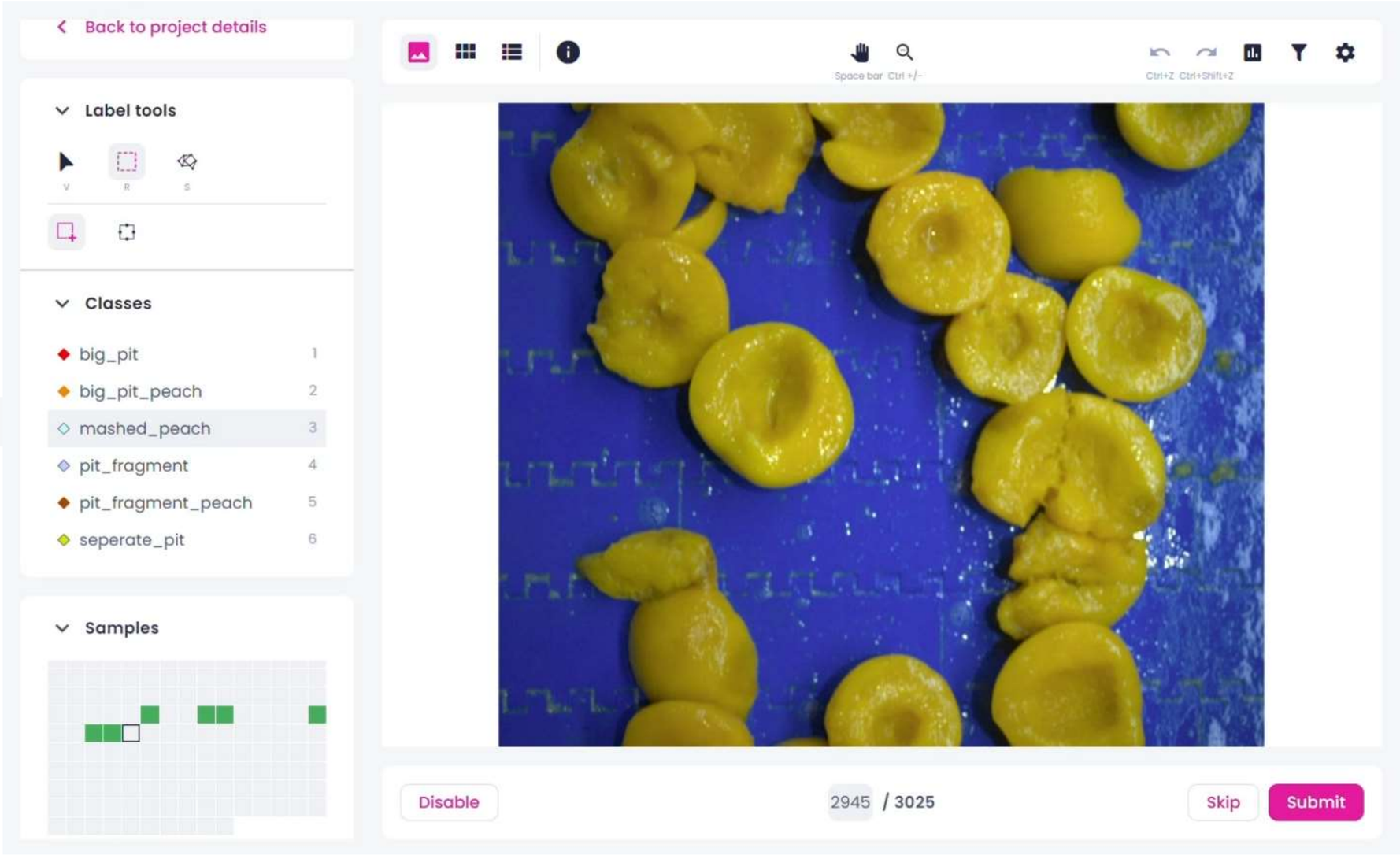
Current process

DATA COLLECTION

- During production
- Varying conditions to represent exceptions and product changes

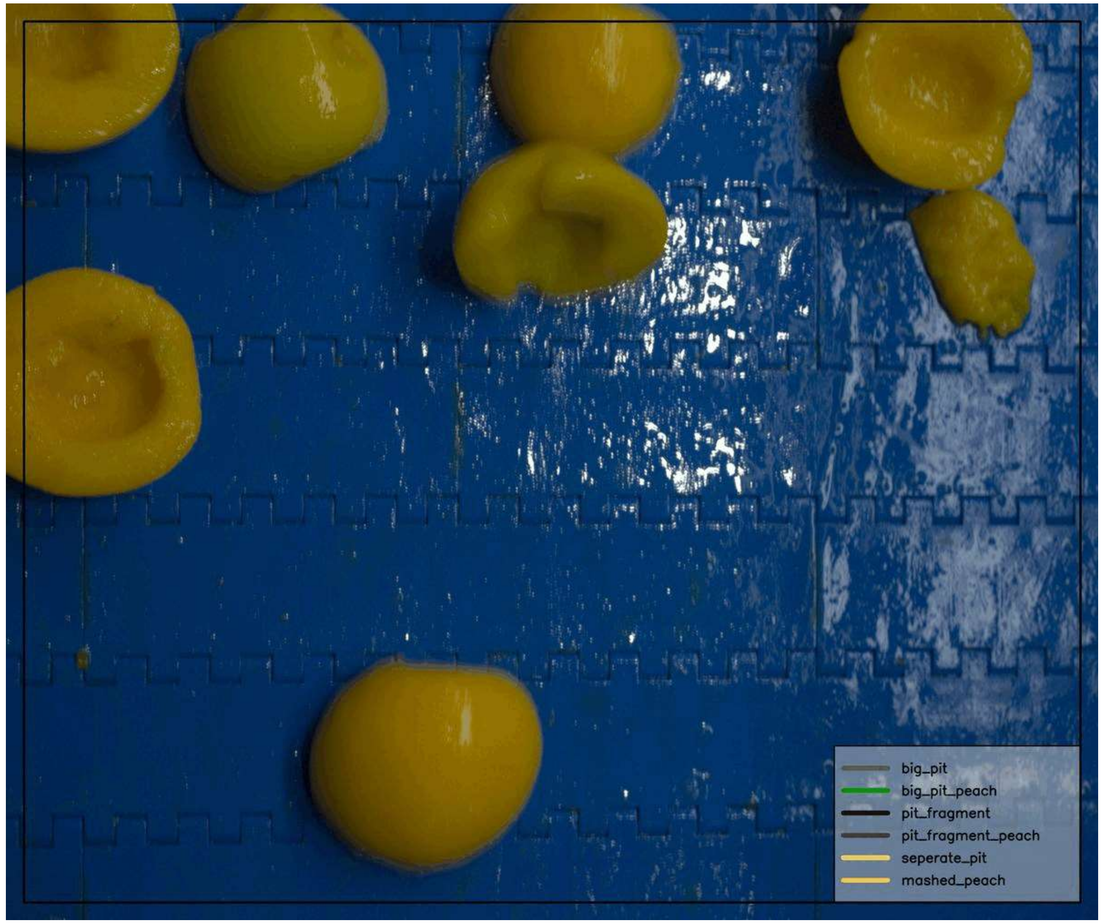


LABELING AND TRAINING OF POC AI MODEL



ROBOVISION

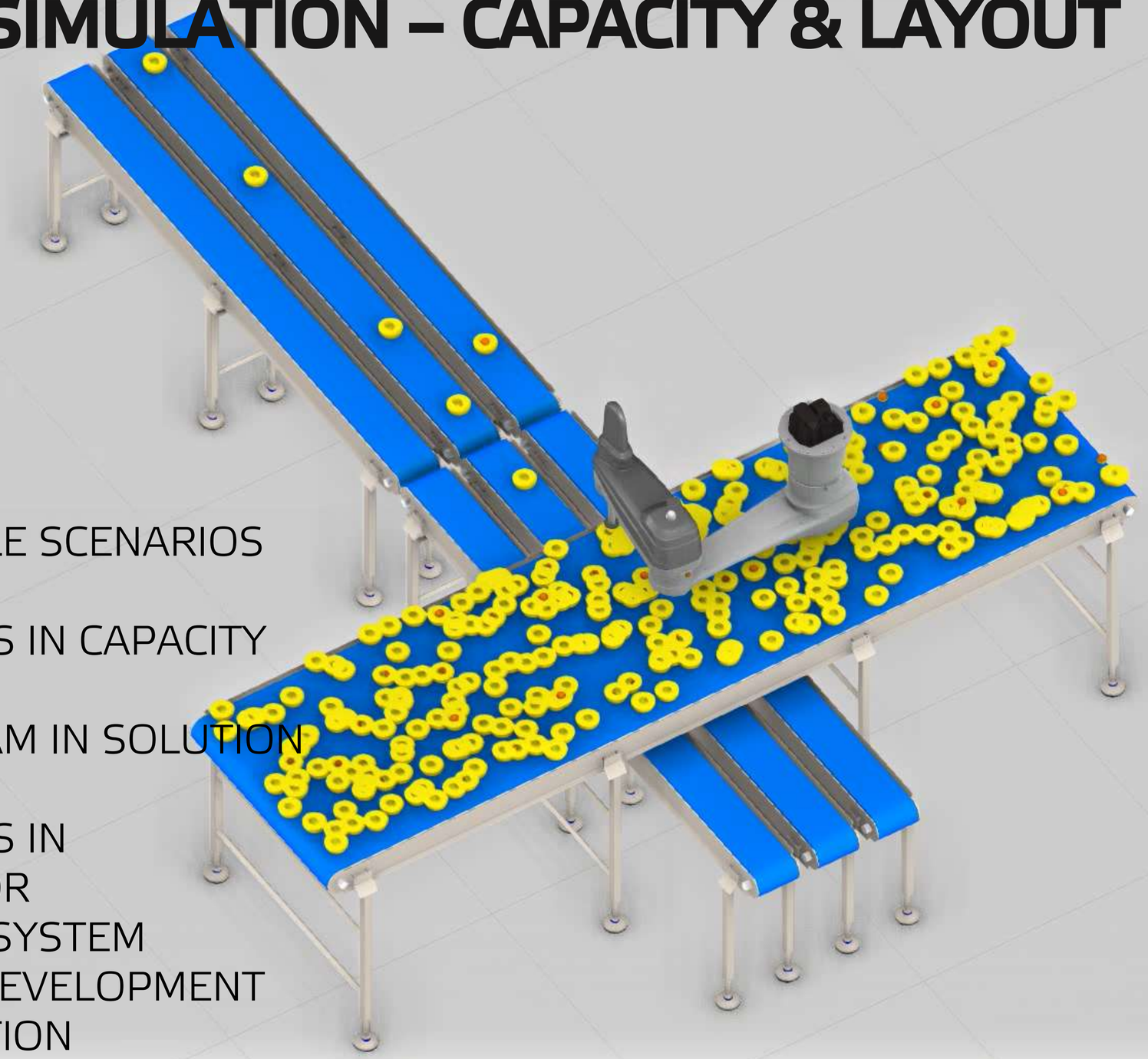
RESULTS OF TEST WITH AI MODEL



BENEFITS

- VALIDATION ON UN-USED DATA SET
- PROVIDES INSIGHTS IN ACCURACY AND RELIABILITY OF INITIAL AI MODEL

SIMULATION – CAPACITY & LAYOUT



BENEFITS

- SIMULATE MULTIPLE SCENARIOS FOR SOLUTION
- PROVIDES INSIGHTS IN CAPACITY AND LAYOUT
- INVOLVE YOUR TEAM IN SOLUTION DEVELOPMENT
- PROVIDES INSIGHTS IN REQUIREMENTS FOR IMPLEMENTATION SYSTEM
- LOWER RISK FOR DEVELOPMENT AND IMPLEMENTATION

PROOF OF CONCEPT - HANDLING

STAQ – QC + SORTING

TESTING @ QING

DEPLOYMENT

QING

MILESTONES

- INSTALLATION END OF JUNE
- COMMISSIONING EARLY JULY
- OPTIMIZATIONS THROUGHOUT THIS SEASON
- OPERATED 24/7

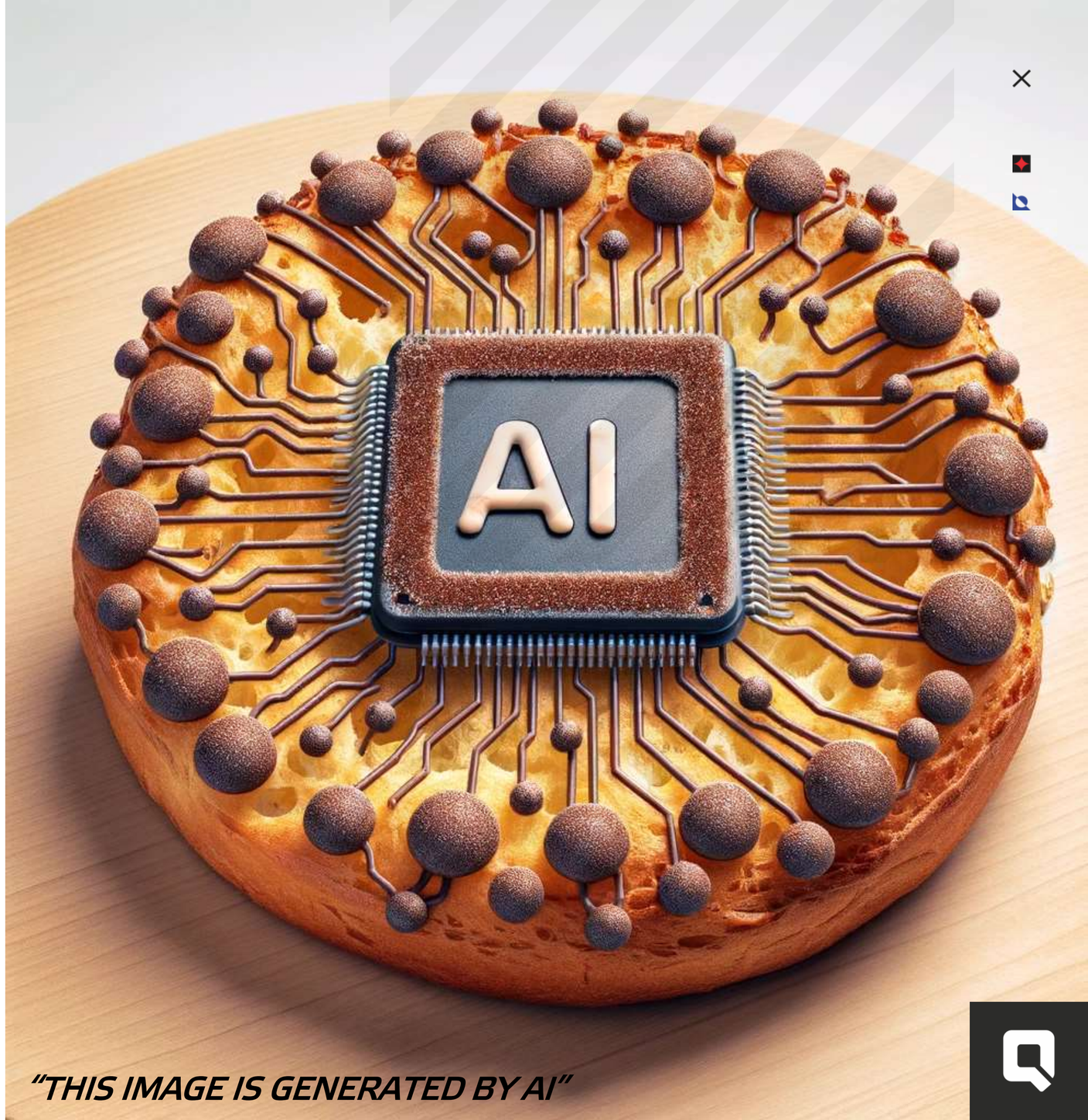
WHATS NEXT

- SYSTEM OPTIMIZATIONS BASED ON LEARNINGS
- 2nd SEASON 2025
- DEVELOP SCALING STRATEGY WITH CLIENT
- SCALE IN 2026 (3-8 SYSTEMS)

QING

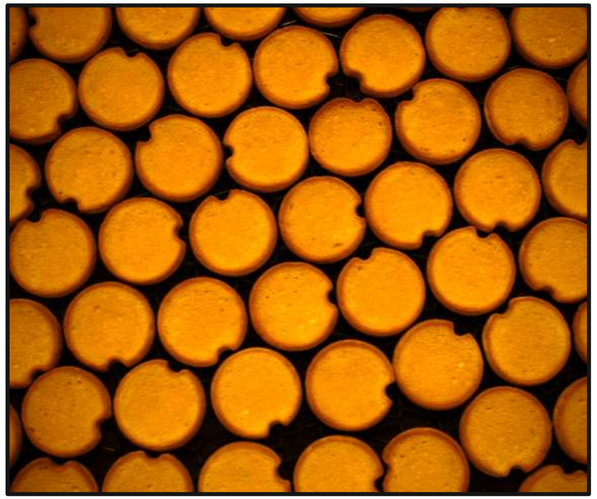
Bolletje

CONTROLLABLE AND RELIABLE PRODUCTION
“every product counts!”



“THIS IMAGE IS GENERATED BY AI”

CLOSE THE LOOP | WE START AT THE END



Product Data

- Objective measurement of quality
- 100% control coverage

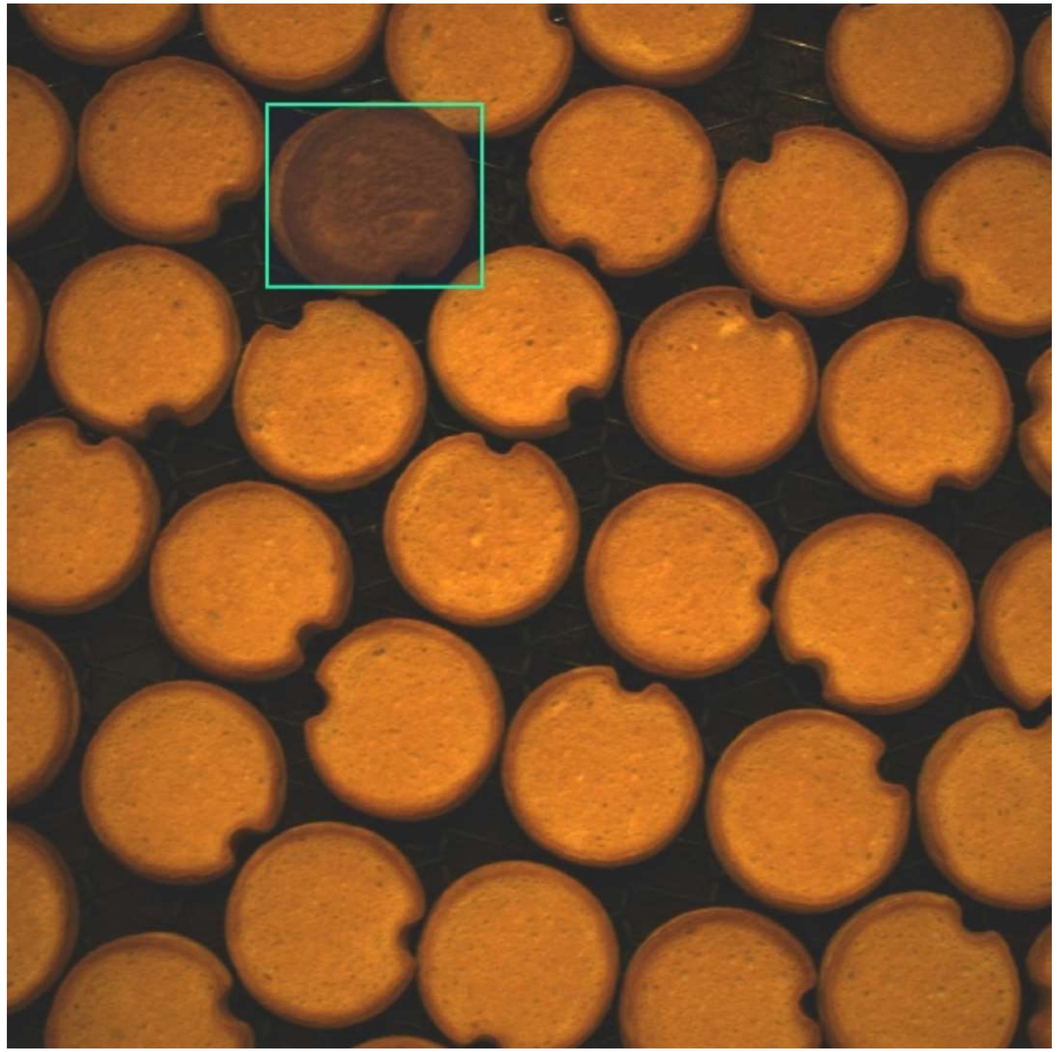
AUTOMATED PRODUCT CONTROL WITH AI

- Concrete step towards “close the loop”
- Basis for the roadmap short and long term
- Learn and gain experience with the technology

AUTOMATED DEFECTS REMOVAL FROM THE PRODUCTION LINE

- Automation of manual activities
- Cost reduction
- Impact on indirect losses in production
- Impact on reducing food waste
- Every biscuit is one!
- Visible within the company
- Creating support base

RESULTS OF TEST WITH AI MODEL



BENEFITS

- VALIDATION ON UN-USED DATA SET
- PROVIDES INSIGHTS IN ACCURACY AND RELIABILITY OF INITIAL AI MODEL

CORRELATE PRODUCT DATA WITH PROCESS DATA

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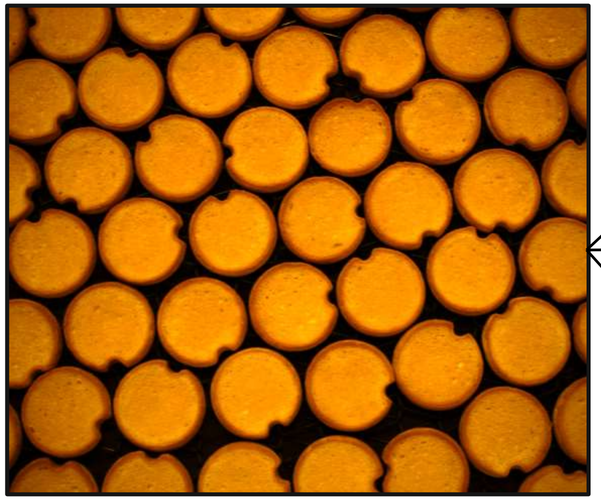
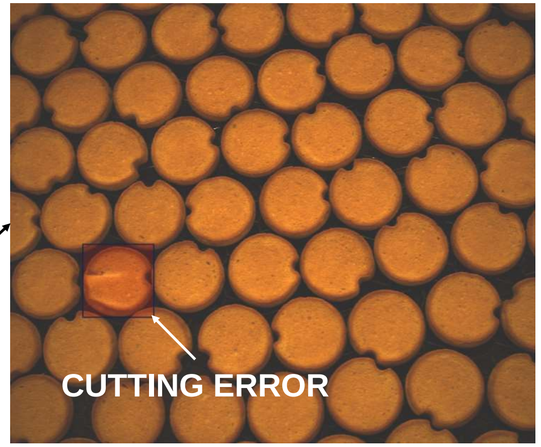
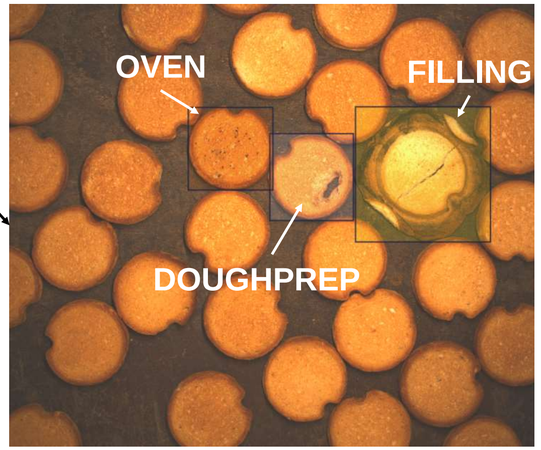
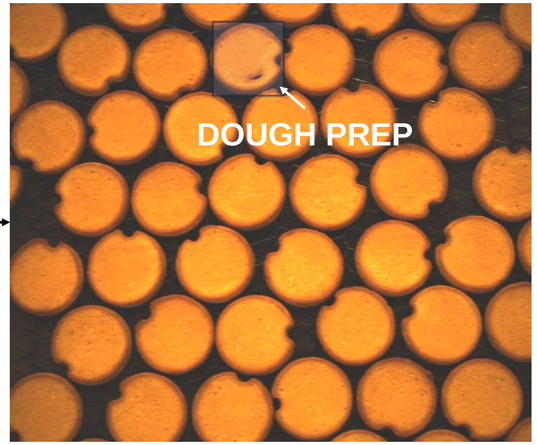




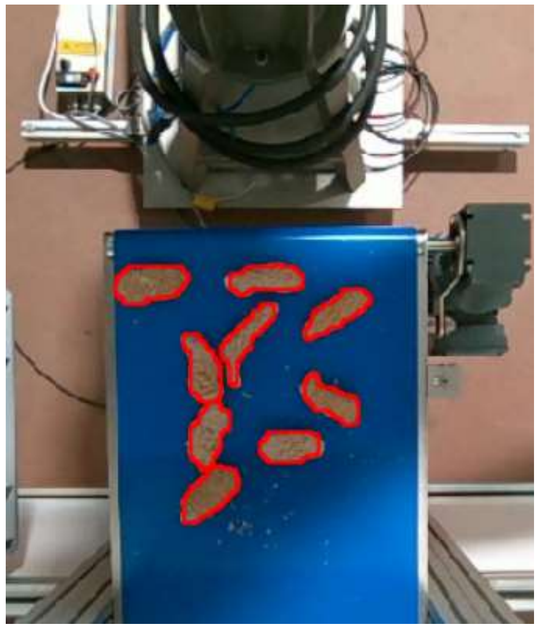


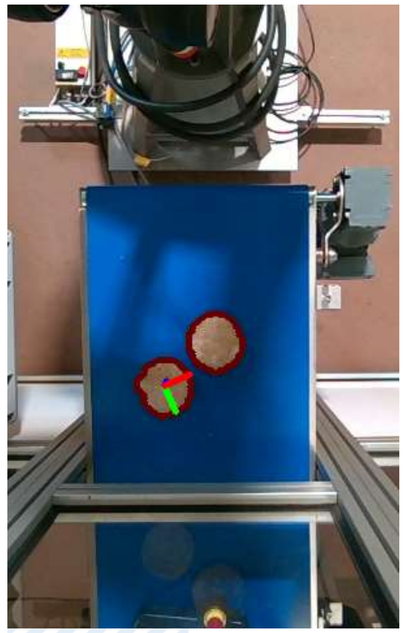


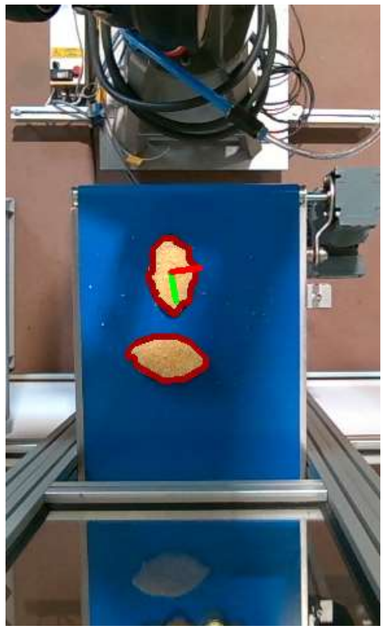
- CORRELATE DEFECTS WITH CAUSE
- FASTER FEEDBACK AND ACTION LOOP
- LEARN TO PREVENT

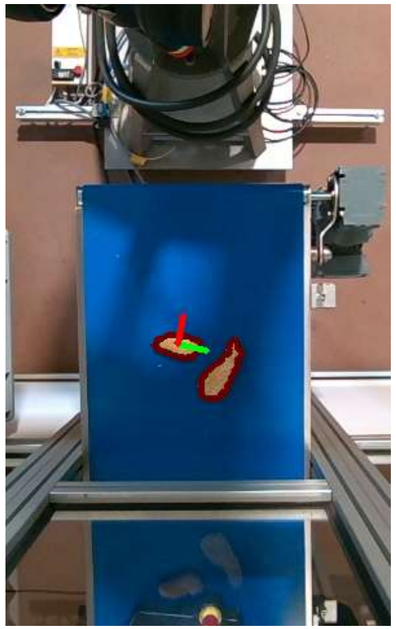
SMART 3D BIN PICKING

- Just one model to recognize individual products
- Integration with 3D camera to determine orientation
- Automated calculation of best picking position and ideal path
- Physical testing with grippers is needed
- Validation with physical setup









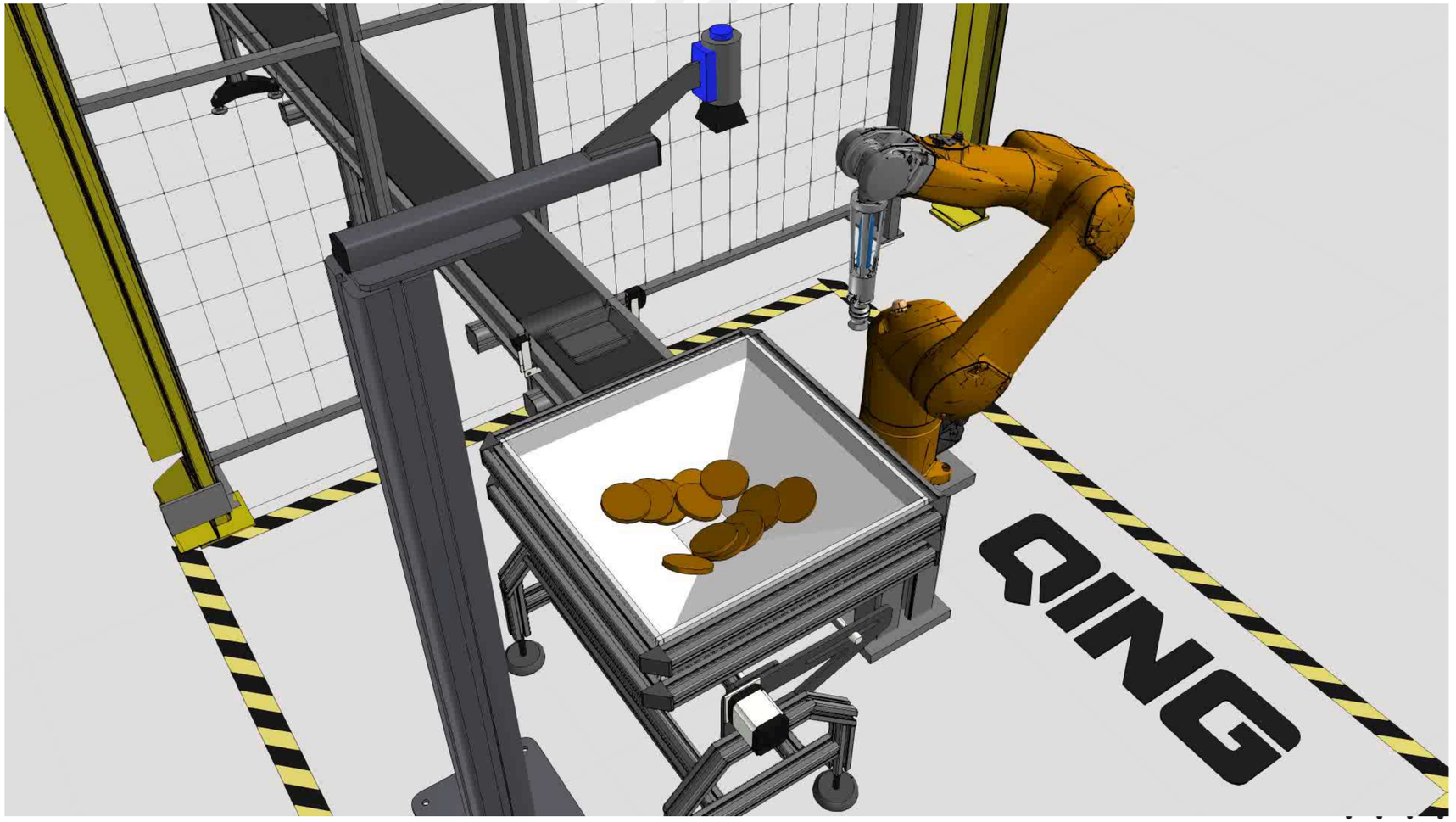
USE SIMULATION TO OPTIMIZE SYSTEM

Various scenarios;

- Layout options
- Type of robots
- Picking strategies

Provides information about;

- Capacity
- Floorspace
- Ergonomics
- Business case



QING

“THE FUTURE OF AUTOMATION EMBRACES DIVERSITY”

BEDANKT VOOR JE AANDACHT!

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