Technical Skills Upgrade

4th Training in Rio de Janeiro,

Universidade Federal do Rio de Janeiro

06th - 09th of May 2019

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Content

Digression

Business Model Canvas

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Value Creation of a Business Model

Building Block	Description
CS = Customer Segments	Different groups of people or organizations an enterprise aims to reach and serve
VP = Value Propositions	The bundle of products and services that create value for a specific Customer Segment
CH = Channels	The way how a company communicates with and reaches its Customer Segments to deliver a Value Proposition
CR = Customer Relationships	The types of relationships a company establishes with specific Customer Segments
R$ = Revenue Streams	The cash a company generates from each Customer Segment

Source: Osterwalder / Pigneur 2010

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Efficiency of a Business Model

Building Block	Description
KR = Key Resources	The most important assets required to make a business model work
KA = Key Activities	The most important things a company must do to make its business model work
KP = Key Partnerships	The network of suppliers and partners that make a business model work
C$ = Cost Structure	All costs incurred to operate a business model

Source: Osterwalder / Pigneur 2010

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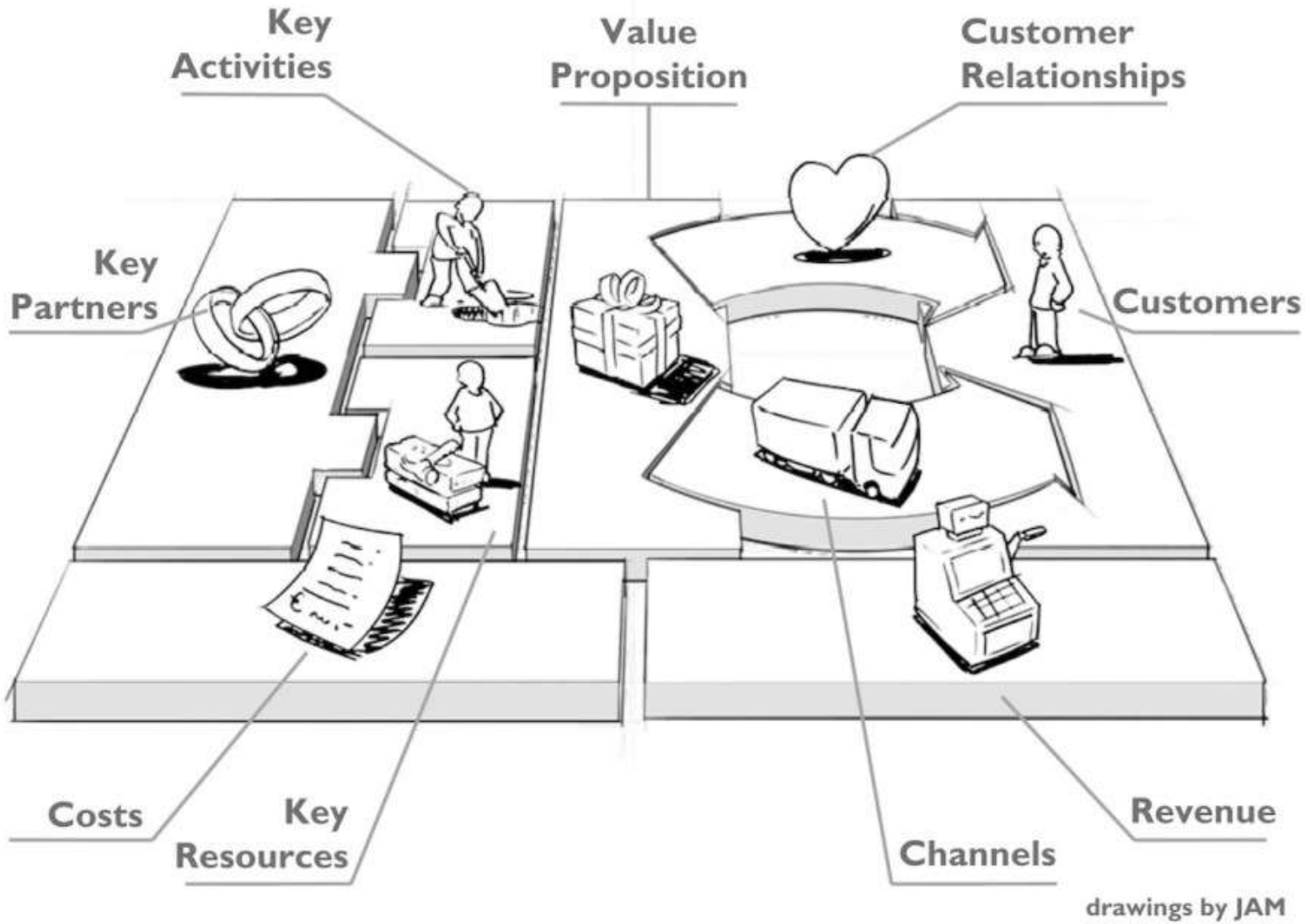
Business Model Canvas



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Building Blocks of the Business Model Canvas

Group Work

Build a business model canvas for the planned or existing equipment

15 min

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Content

The Flix laboratory at the Faculty of Mechanical and Process Engineering

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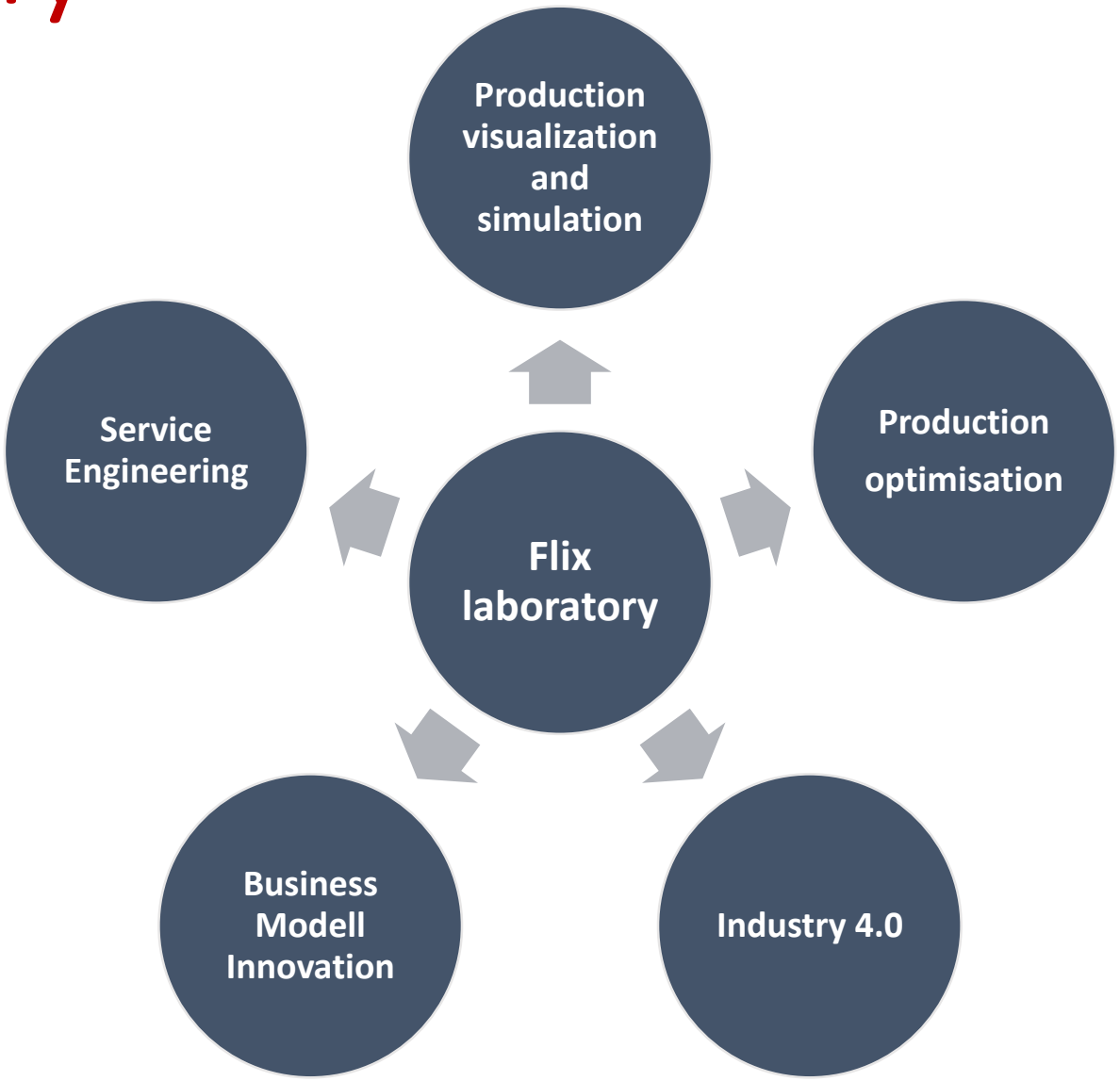
FLiX laboratory



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Content

Production visualization and simulation

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Laboratory equipment

+

3DF ZEPHYR

PHOTOGRAMMETRY FOR EVERYONE

basecamp-shop.com/uploads/productgalleryfile/images/originals/s1-img-2103a7274a03d031f129b9cd360c2ee3.png

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Drone

- simple and intuitive control
- Safety in flight and stability
- Small Dimensions
- Power
- Camera resolution and stability
- No need for payload

basecamp-shop.com/uploads/productgalleryfile/images/originals/s1-img-2103a7274a03d031f129b9cd360c2ee3.png

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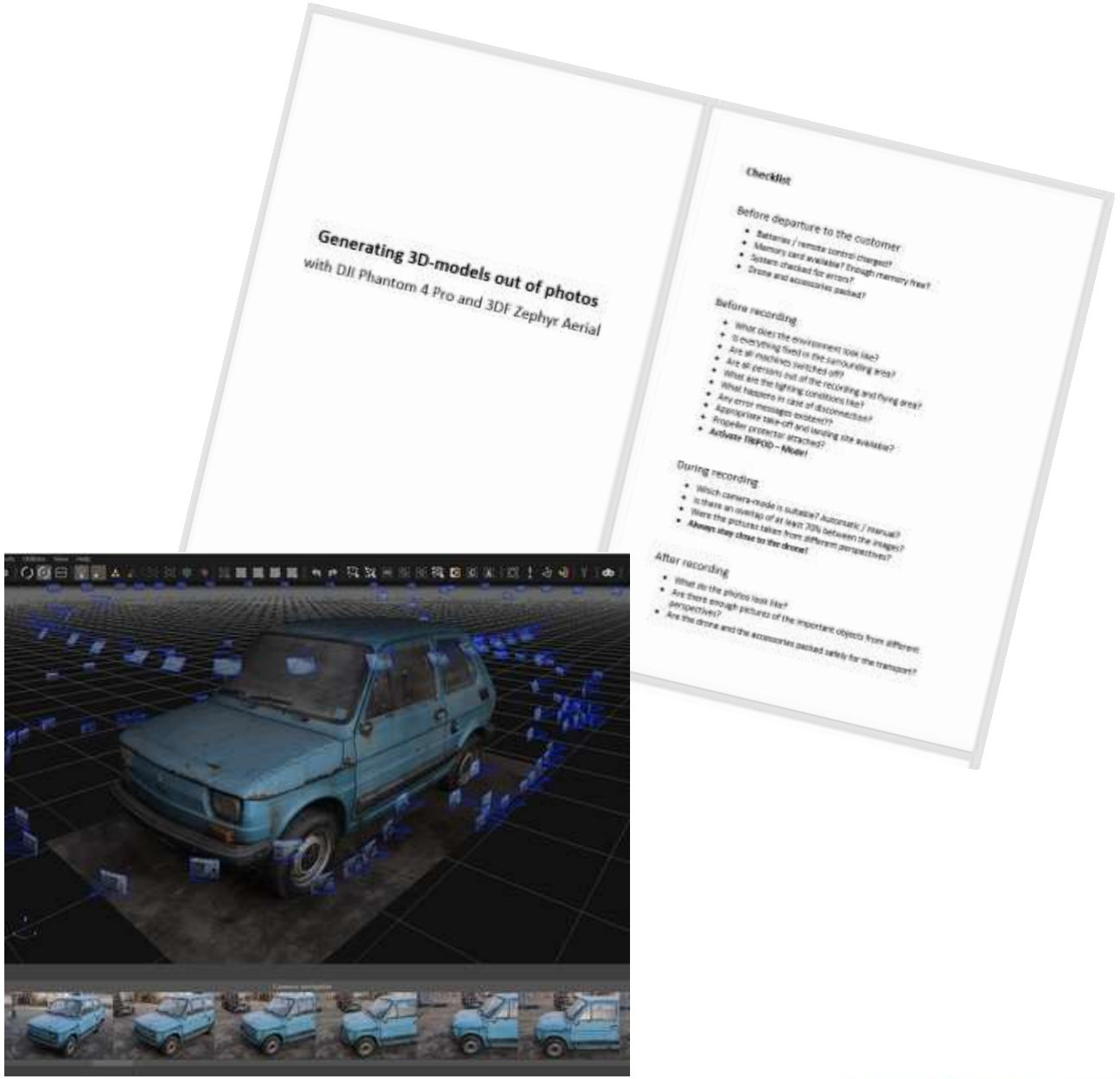
3DF Zephyr

- easy to use without extensive training
- fast good result
- if required, there are many setting options to achieve an excellent result
- There are a few basic things to consider when taking pictures



Source: 3Dflow SRL

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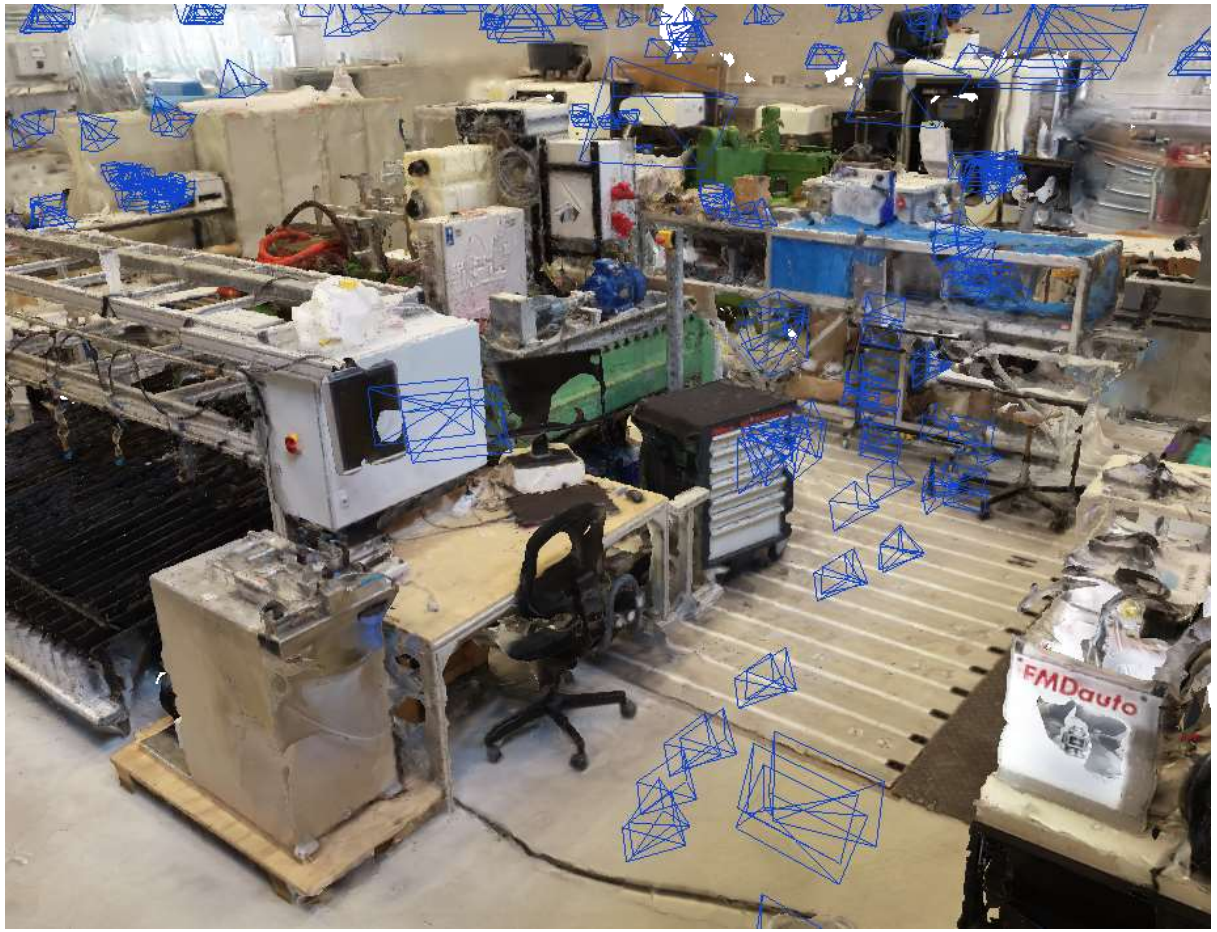
Visualization of the machine hall



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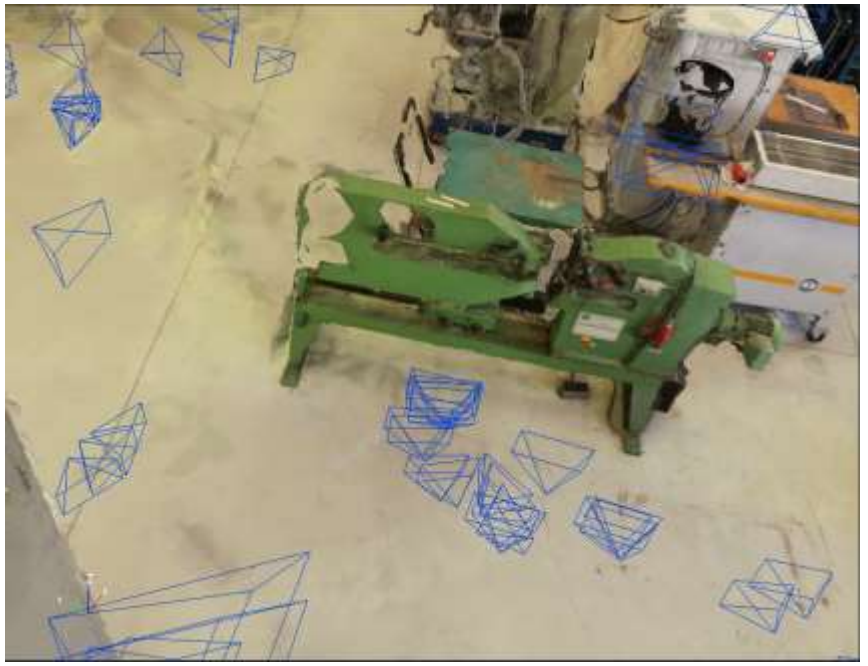
Visualization of the machine hall



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Lessons Learned

tight spaces	→ Deactivation of sensors
missing GPS signal	→ no self-stabilization
	→ no flight route specifications
high wind occurrence	→ strong turbulence
lighting conditions	
reflections	→ poor image quality
windows	

image error due to light conditions

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Further projects

UMT drone (Oktocopter) for environmental measurements in Düsseldorf

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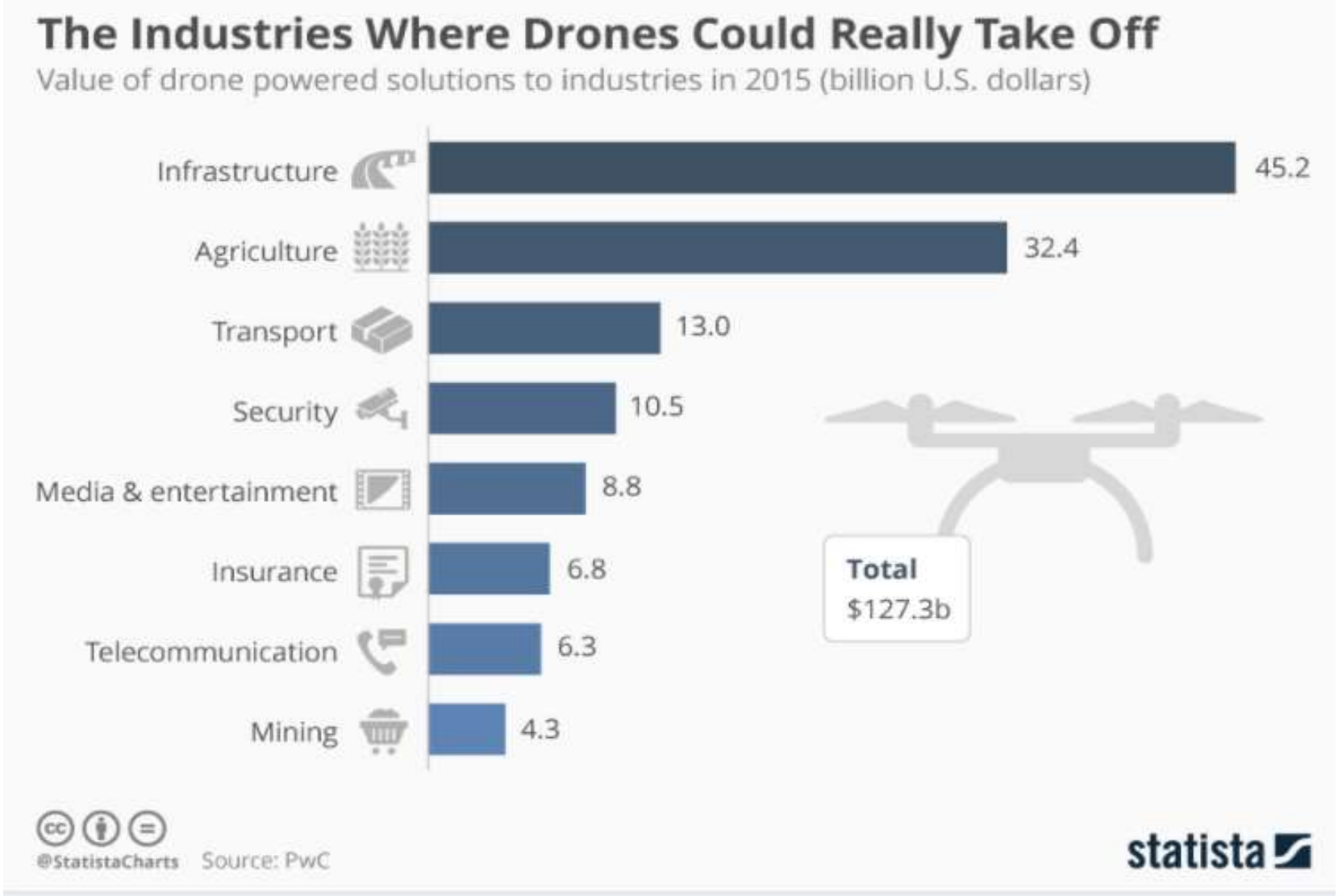
Further examples of application



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Picture: www.motor-talk.de

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? !

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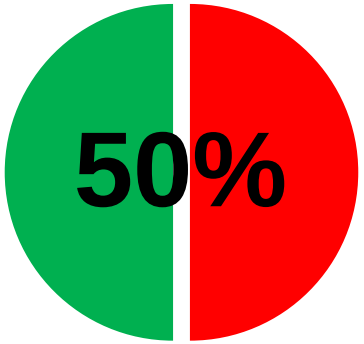
Results of the test

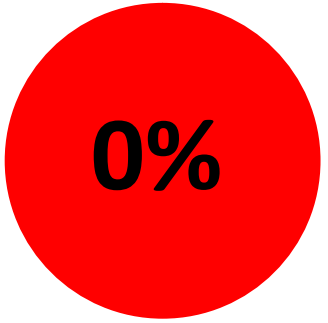
…remembered the hair colour of the girl



…remembered the brand of the car

Taken at a conference on the 24th of June 2014 (60 participants)
Picture: Own Design

BUT



…remembered the company and the real purpose of the booth

So?
….nice booth….but bad branding

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Content

EYE- Tracking

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Existing and planned eye tracking systems of the Flix Laboratory

Tobii

SMI

Microsoft Hololens 2

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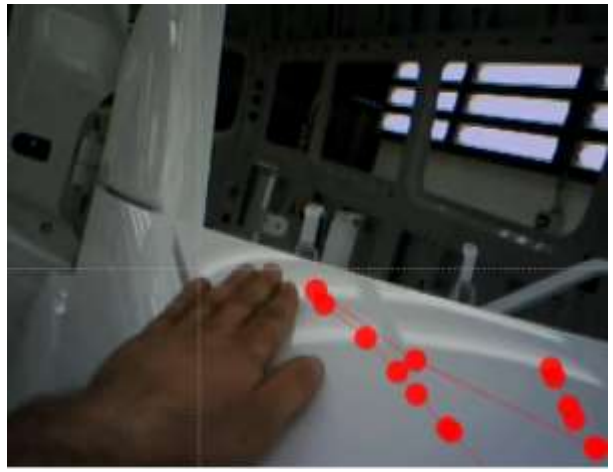
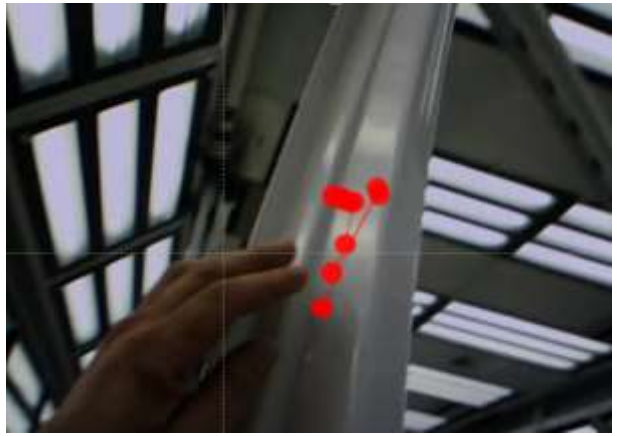
Workstation optimization through eye tracking





Eye-Tracking Studies

- Work center optimization from the worker's point of view
- Occupational safety (perception of safety boards etc.)
- Quality control
- design studies
- usability

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Experimental Study – Research Issue / Set Up

- Quality control of a paint shop of a European producer of transporters

- Analysing the following questions:
  - Sequence of quality control inspection
  - Control duration (t) of sensitive parts
  - Improvements of the work environment/conditions

- Tobii Eye Tracking Glasses I, Tobii Professional 3.2.1, Microsoft Office 2013, questionnaires, observation sheets

Picture: Tobii Technology GmbH

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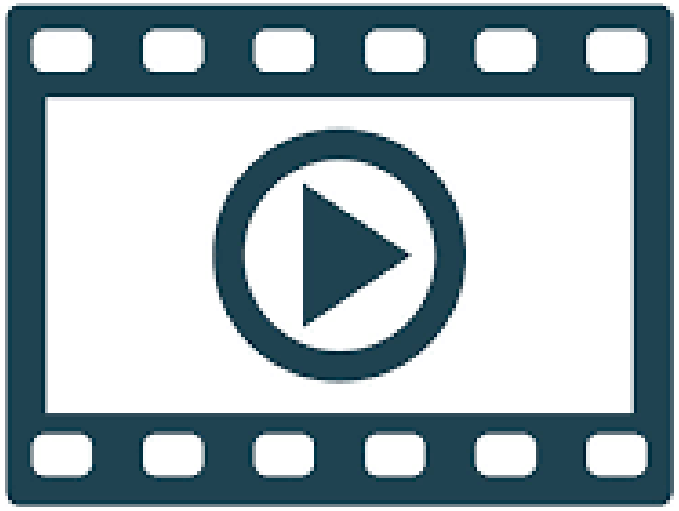
Quality control of a paint shop of a European producer of transporters



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Experimental Study – Data Analysis

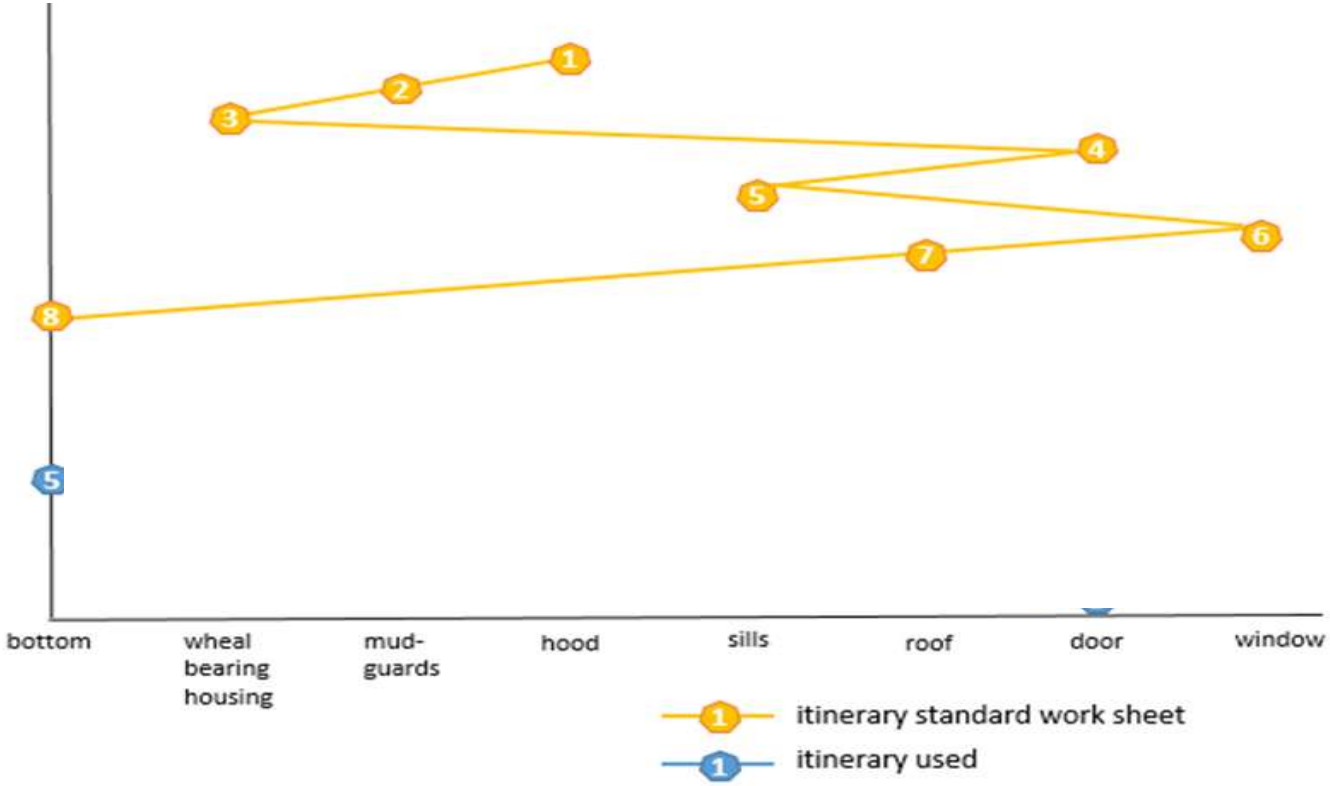

Figure: Own Design

- **Findings:**

✓ Itinerary used is not equal to the one on the standard work sheet

✓ „Practice“ shows a more user-friendly itinerary

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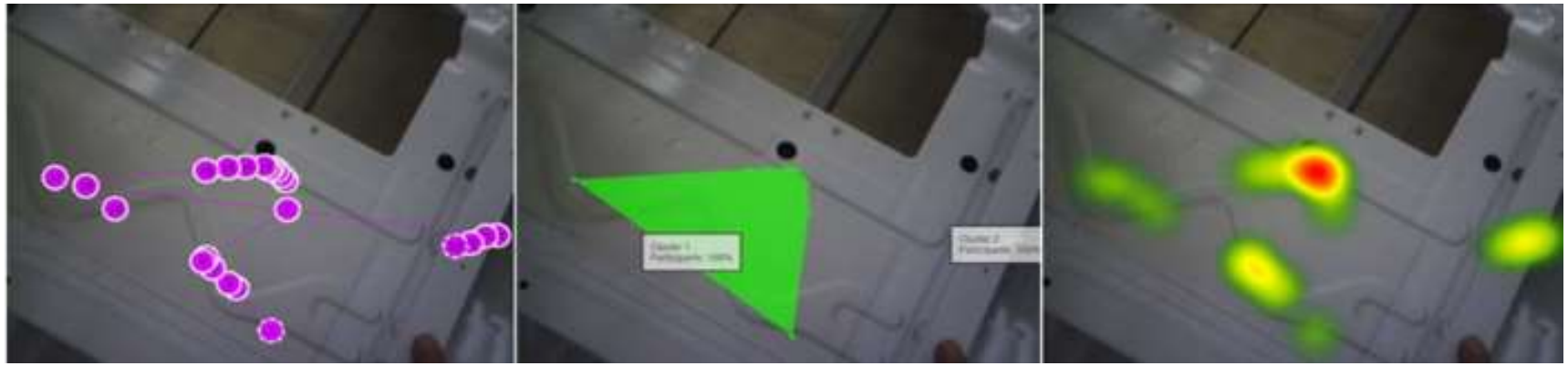
Experimental Study – Data Analysis II



Gaze plots **Cluster** **Heat Map**

Figure: Own Visualisation with Tobi Professional 3.2.1

- **Findings:**

✓ Visualization shows that most parts have not been controlled properly

✓ Too less time has been spent on checking “sensitive” areas

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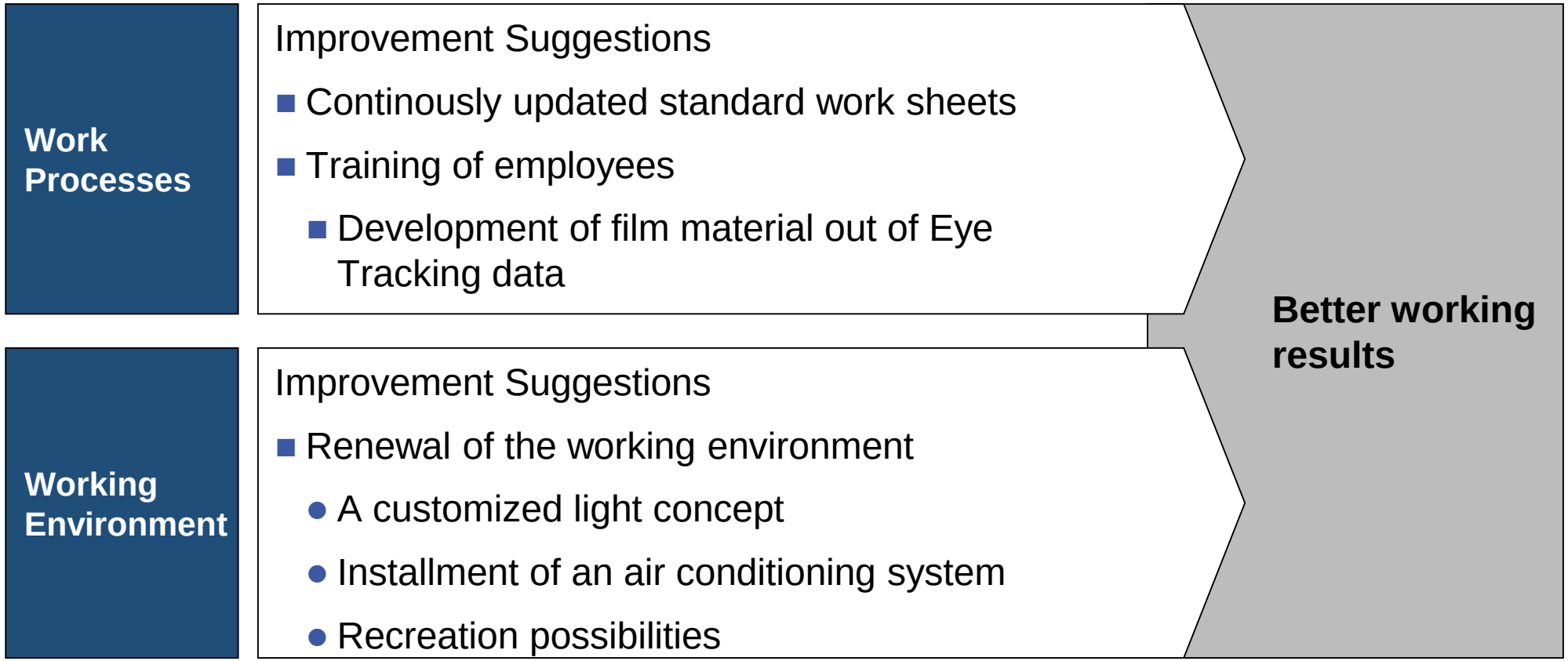
Experimental Study – Conclusions



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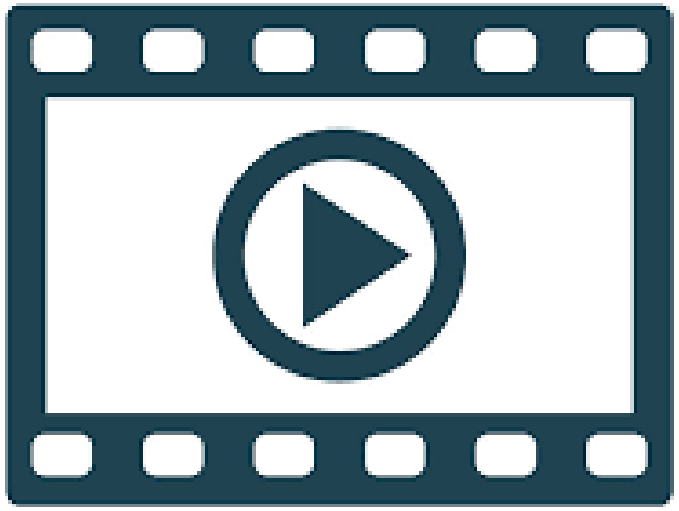
Quality management control of the assembly of a head up display



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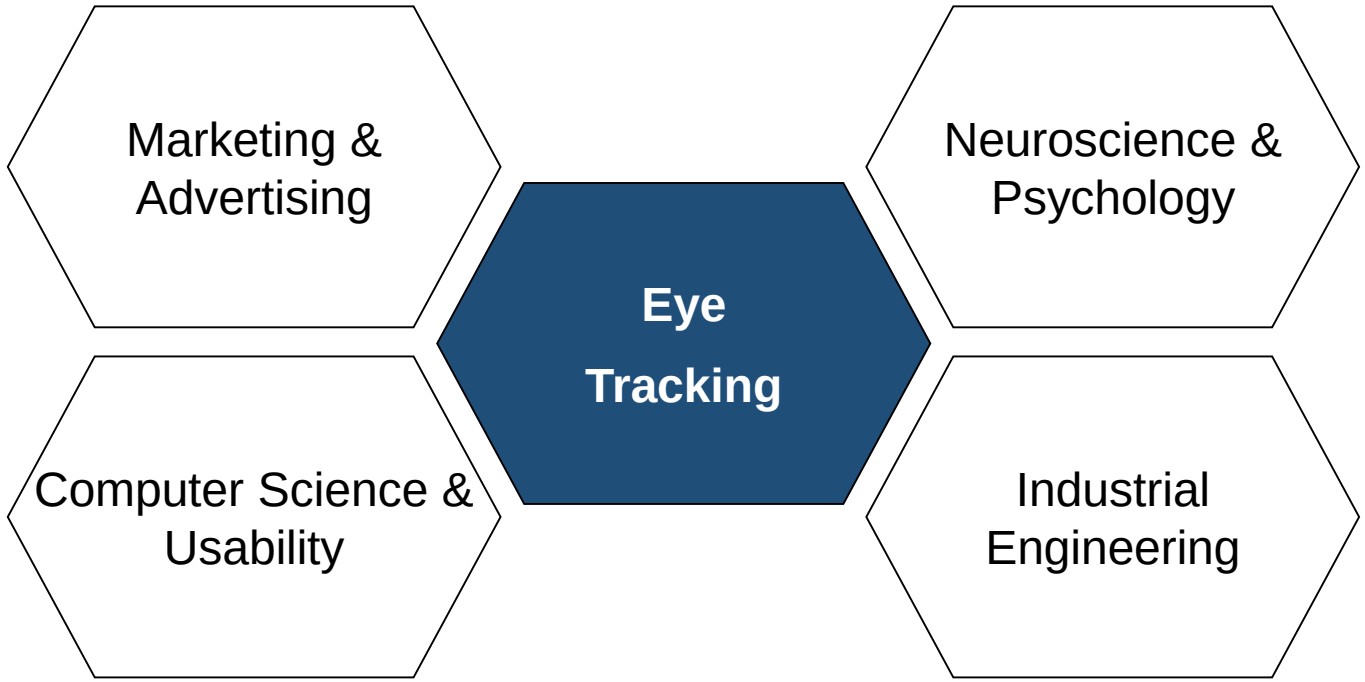
Practical Studies

Areas of Application



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Content

miniFab

Industry 4.0

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Needs of industry and students

Understandable

Manageable

tangible

interdisciplinary cooperation

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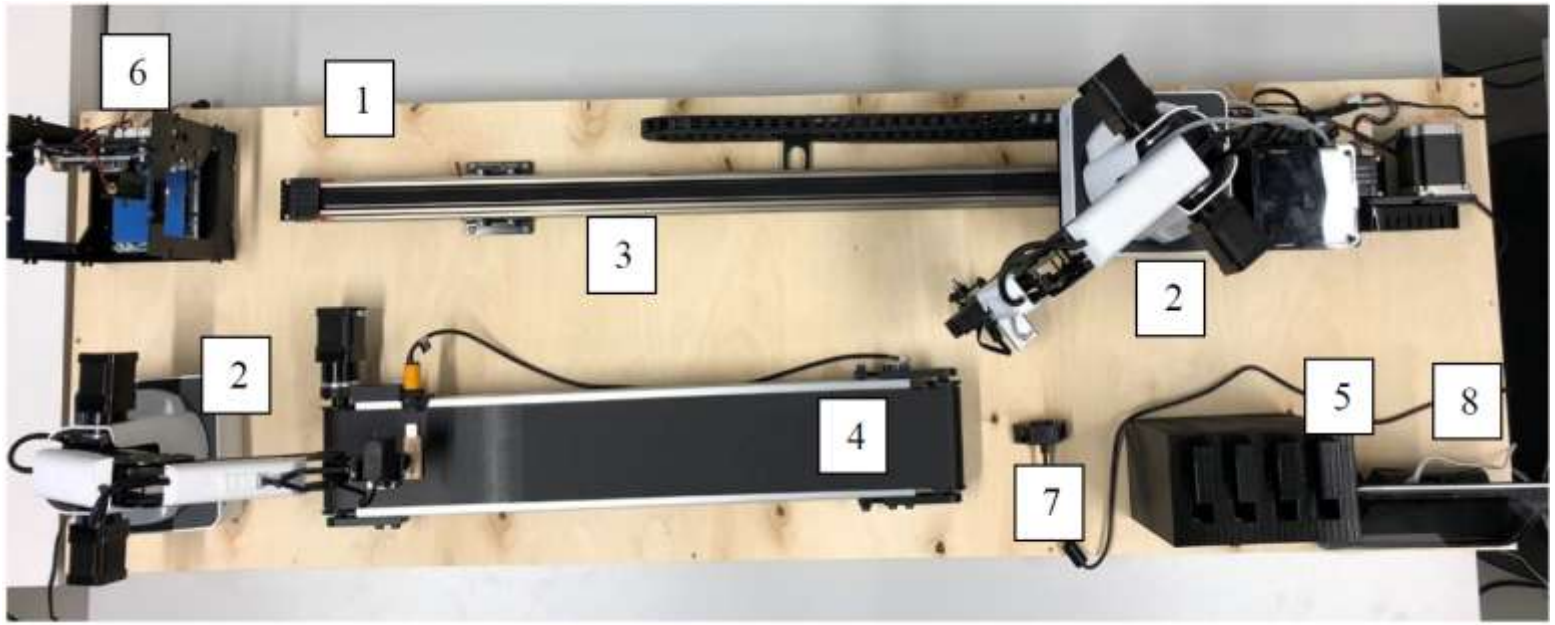
miniFab



Number	Component	Task
1	Base plate	Basis
2	Robots	Moving parts
3	Sliding rail	Range extension
4	Conveyor belt system	Connection workstations

Number	Component	Task
5	Storage system	Raw material supply
6	Engraving machine	Engraving HSD logo
7	USB Port	Data transmission
8	Raspberry Pi	Central control unit

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Components - MiniFab

Dobot Magician

Specification	Value
Number of Axes	4
Payload	500 g
Maximal reach	320 mm
Position Repeatability	0.2 mm

Vacuum Suction Cap

Gripper

Storage system body

Raspberry Pi with Interface

CODESYS

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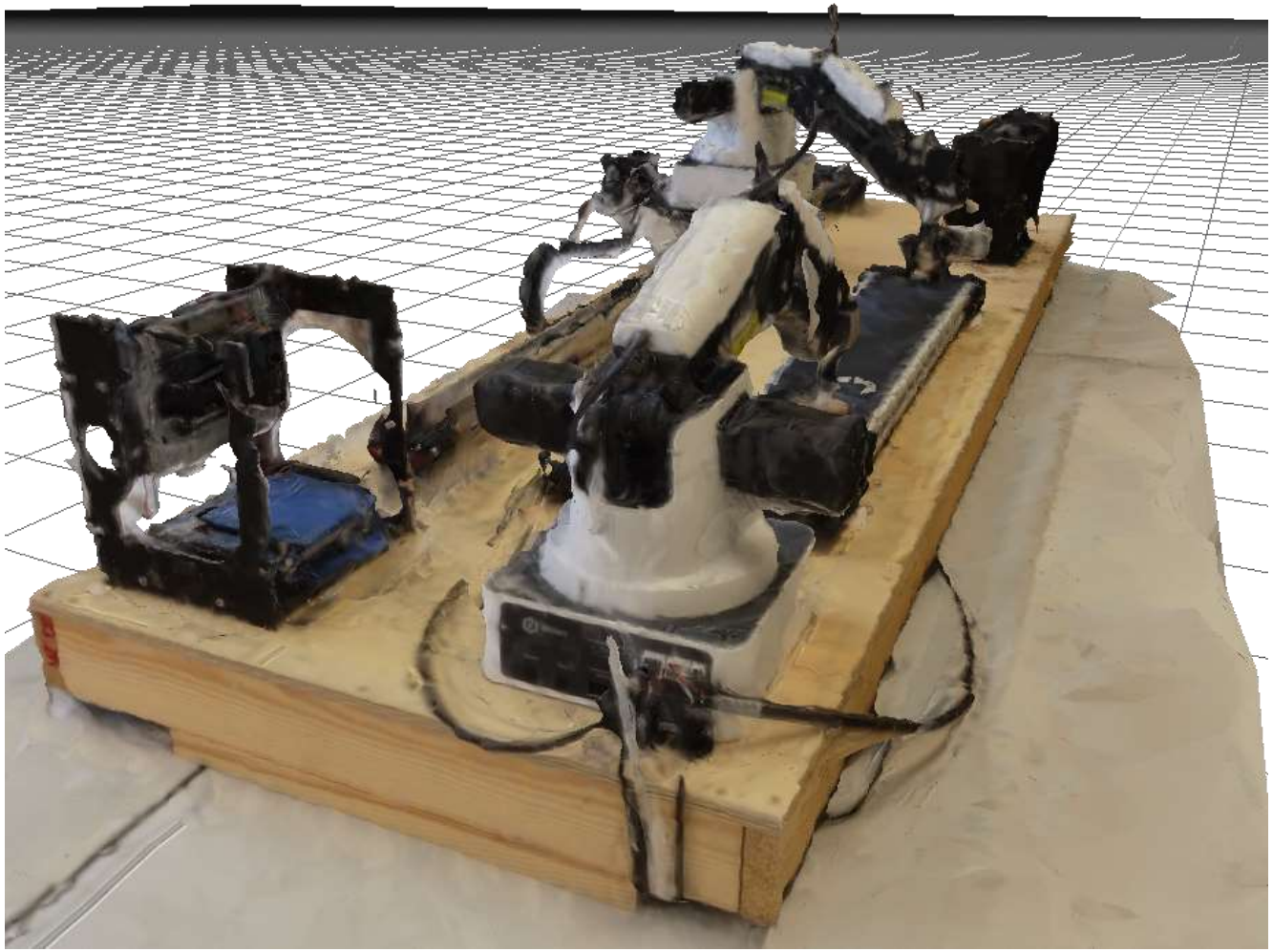
3D Modell of the MiniFab



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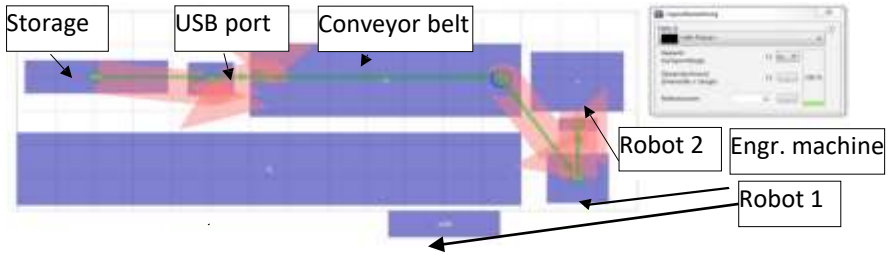
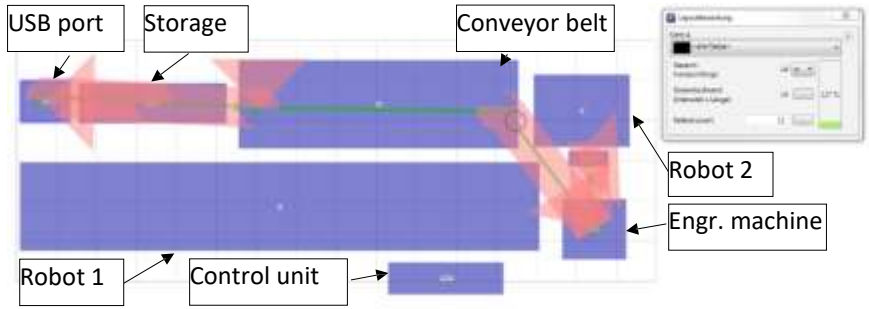
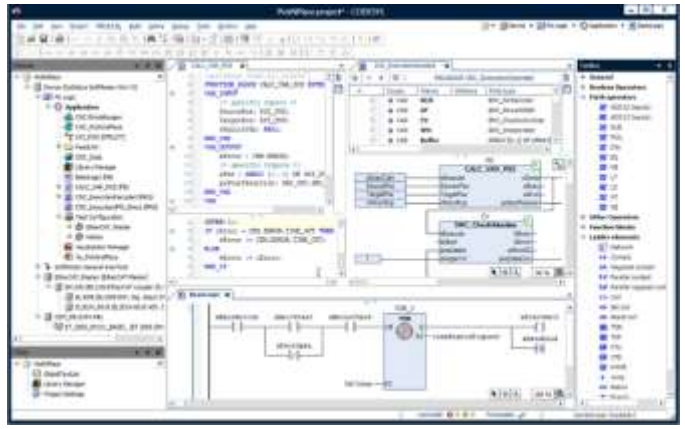
Areas of Application

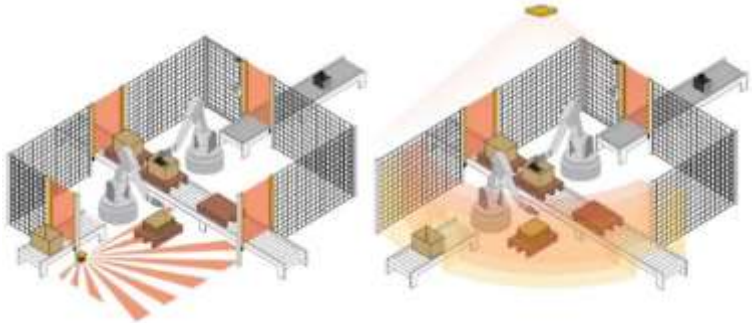




Layout planning and material flow analysis



programming and automation



safety concepts

visualization and optimization

interdisciplinary teams

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