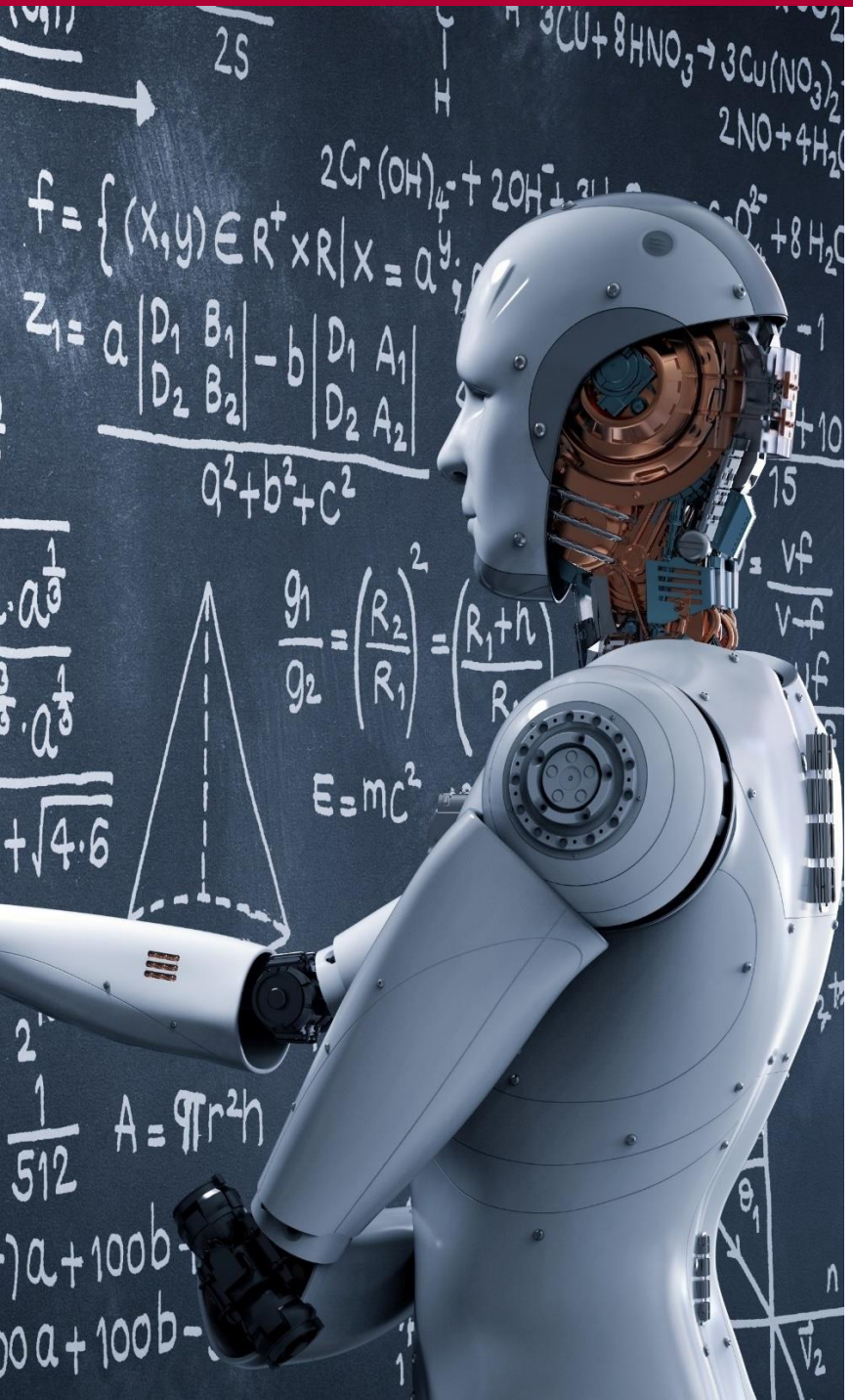

Research Center for
Information Management

Fraunhofer
FIT

Smart Sustainability Simulation Game

Case 3: Quality Management- Unit 2
11.06.2024

FIM Research Center for Information Management
Fraunhofer Institute for Applied Information Technology FIT,
Branch Business & Information Systems Engineering

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Augsburg Bayreuth Frankfurt Luxembourg Munich Stuttgart

Pizza & Praxis Insights:
Die Allianz Leben beantwortet eure Fragen

Dr. Katrin Heim
Leitung des Fachbereichs Kundenportale und Vertriebsprozesse

Allianz

Dr. Rebecca Westphal
Referatsleiterin Prozessmanagement

Wann?	Donnerstag, 18.06.2024, 18:00 Uhr
Wer?	20-25 interessierte Studierende
Wo?	Blauer Saal, Schloss Hohenheim 1, Universität Hohenheim
Wie?	In entspannter Atmosphäre - Für Getränke und Pizza ist gesorgt
Anmeldung	QR-Code scannen und bis zum 16.06. anmelden

Allianz

- einer der weltweit führenden Versicherer und Vermögensverwalter
- mehr als 100 Millionen Privat- und Firmenkunden in mehr als 70 Ländern
- gehört zu den führenden Unternehmen der Versicherungsbranche weltweit

Jetzt QR-Code scannen und anmelden

01

Case 3: Quality Management - Unit 1

Overview of the cases

Recap

Case 1: Material procurement

- What materials should I buy and when?
- Value chain level: Procurement

→ Time Series Analysis

Case 2: Predictive Maintenance

- How often and when should I maintain my machine?
- Value chain level: Operations/production

→ Predictive Analytics

Case 4: Recycling

- How much effort do I put into recycling?
- Value chain level: After-sales-services

→ Process Mining

Case 3: Quality Management

- How to ensure good quality?
- Value chain level: Operations/production

→ Computer Vision

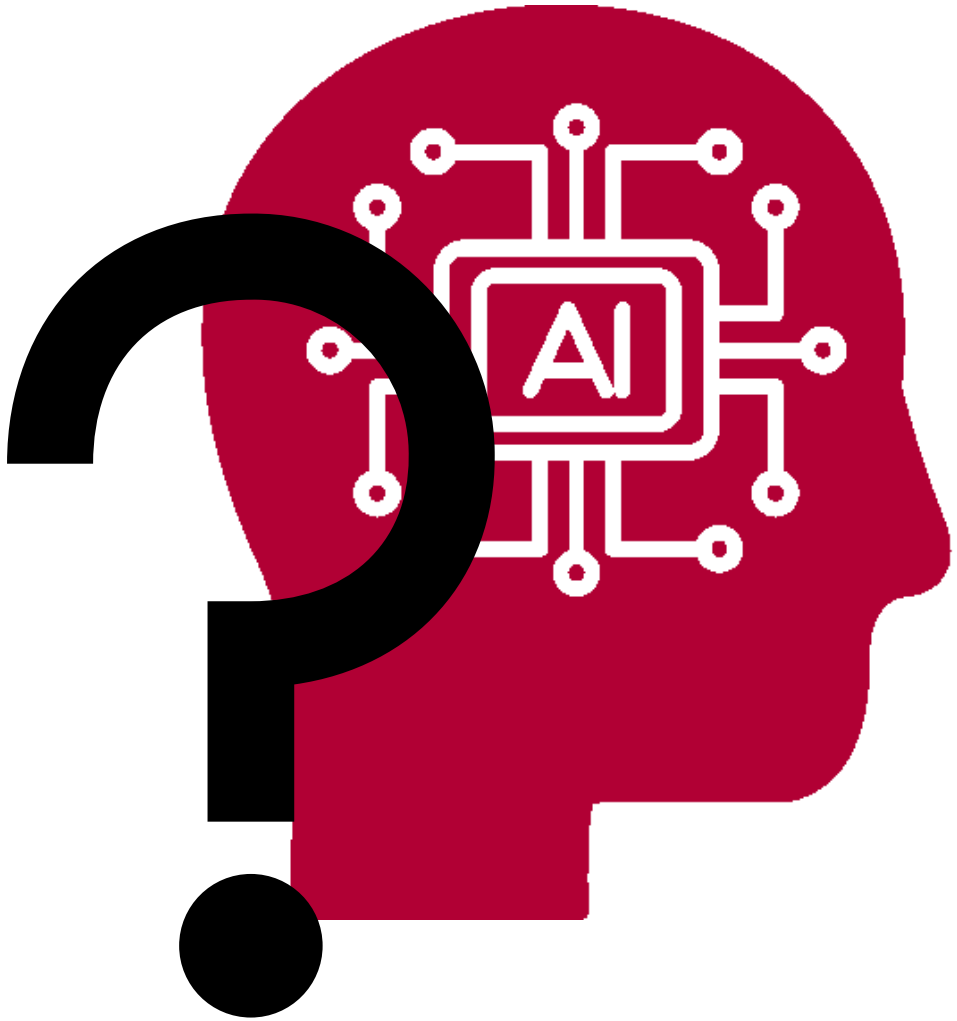
Case 3: Quality Management of Edison Cars AG – Task

Recap

Goal of the task of case 3 is to develop an algorithm for the **quality control** of an e-car production. This algorithm should **detect scratches** on the back side of a car and decide whether it is more efficient to **exchange the part** with the scratch or **correct it**.

The company management wants you to implement their quality control system

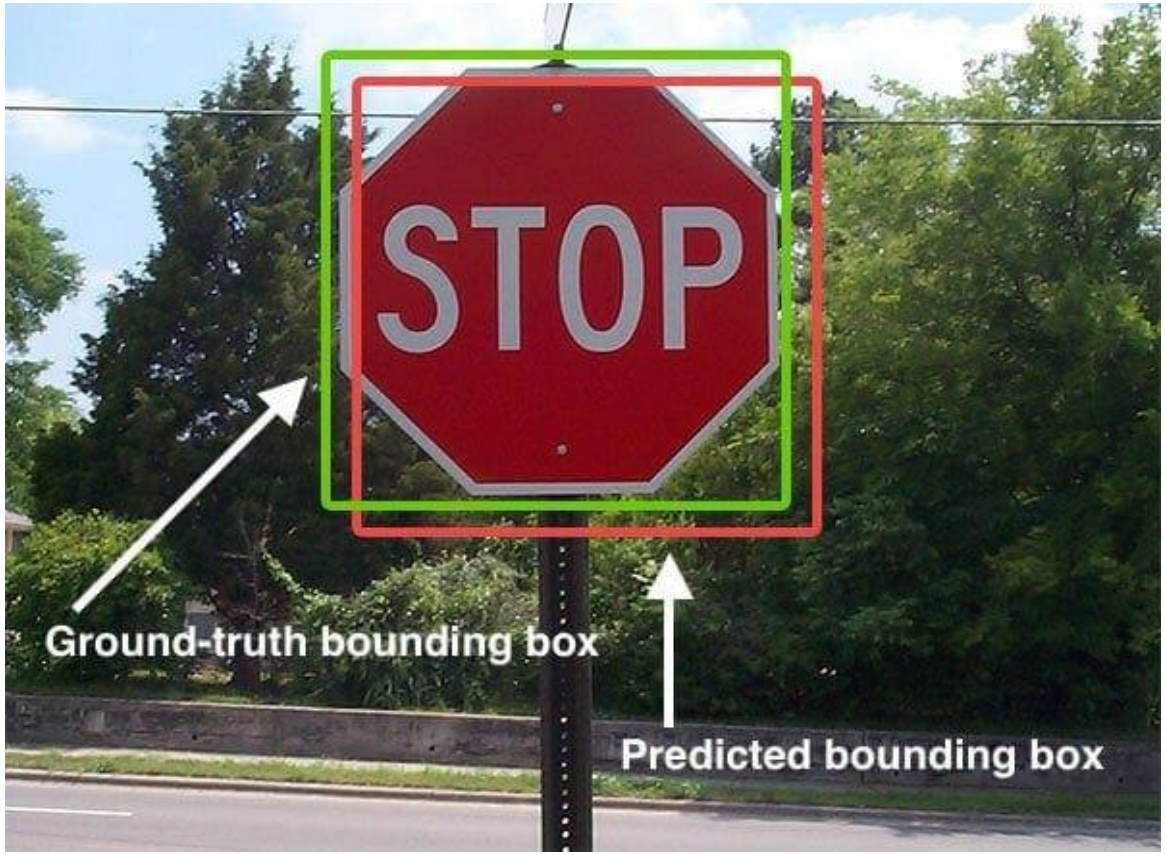
Time for Feedback



How was the first week?

Any Questions?

Evaluation of your results – Intersection over Union (IoU)



$$IoU = \frac{\text{Area of Overlap}}{\text{Area of Union}}$$

Case 3: Leaderboard – Unit 1

Team Dolphin

IoU: 86,6%

Team 1

#Cars: ?

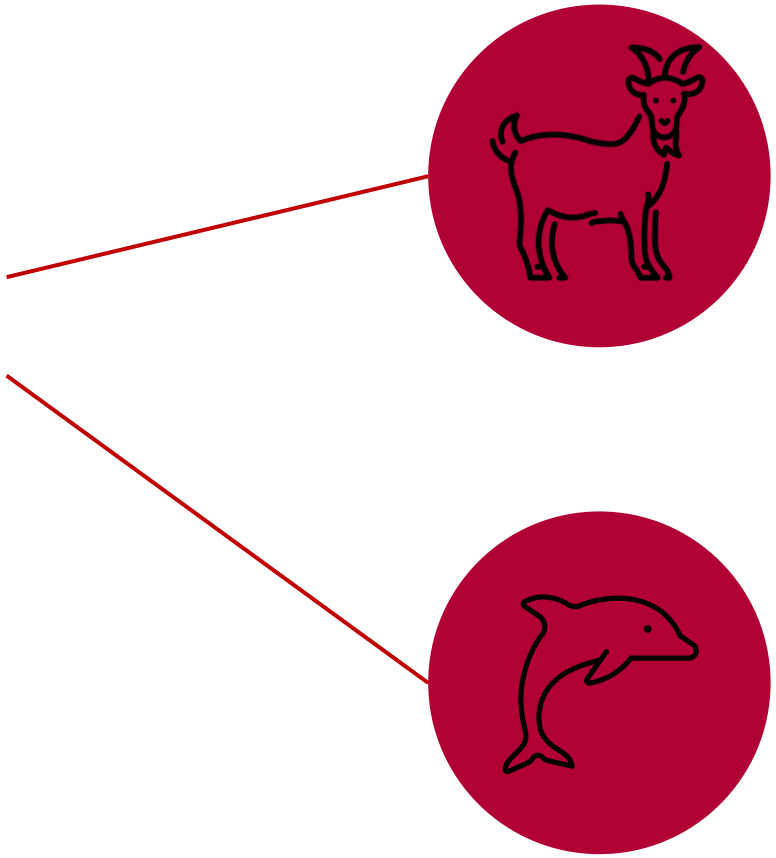
Team 1

CO_2: ?

Team 1

Impact: ?

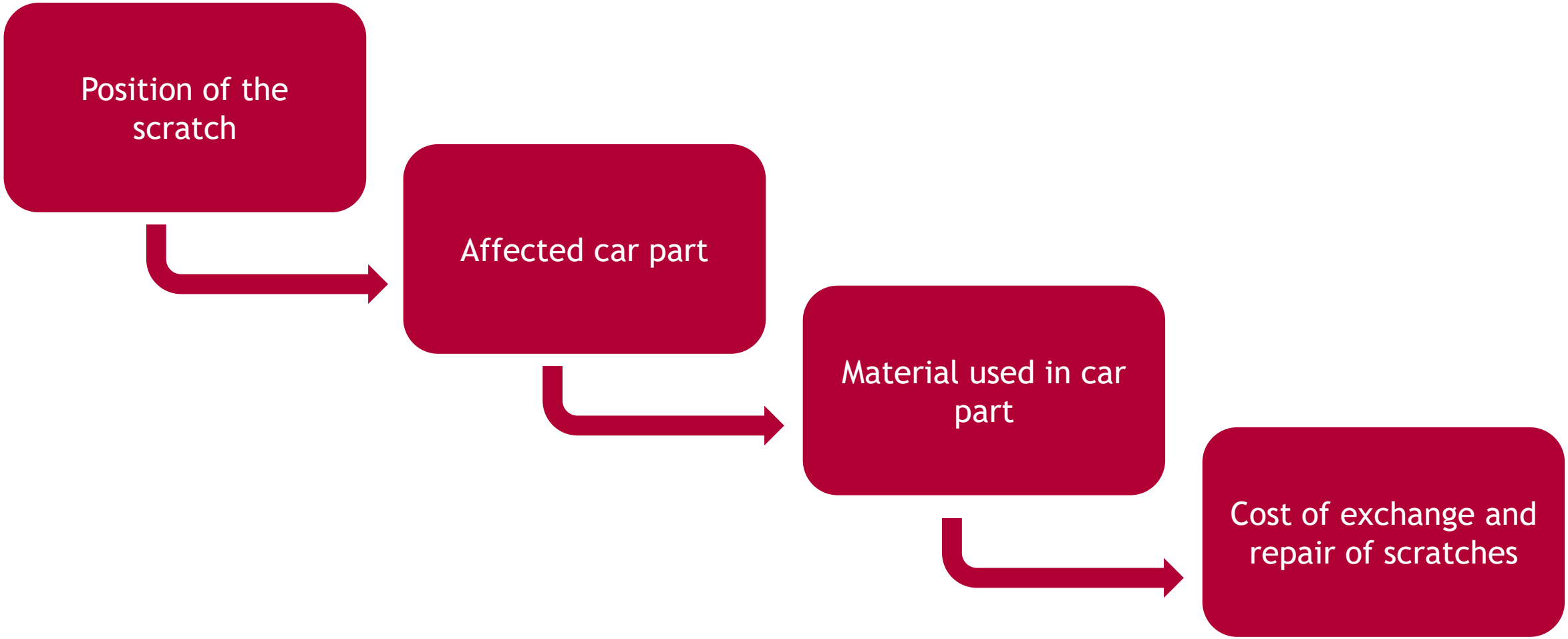
Case 3: Presentation of results



02

Case 3: Quality Management - Unit 2

Case 3: Why scratch localization matters



Case 3: Quality Management of Edison Cars AG – Costs

Scratch on the Top	Scratch in the Middle	Scratch on the Bottom
Exchange Costs: Material: 150 CO_2: 2 CO_2 Points	**Exchange Costs:** Material: 70 CO_2: 6 CO_2 Points	**Exchange Costs:** Material: 30 CO_2: 9 CO_2 Points
Correction Costs: Material: 130 CO_2: 3 CO_2 Points	**Correction Costs:** Material: 80 CO_2: 5 CO_2 Points	**Correction Costs:** Material: 90 CO_2: 3 CO_2 Points

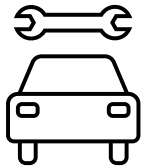
Case 3: Your task in week two

1. Extract coordinates from the scratches from your object detection and transfer to car parts
2. Decide on the handling of the affected car parts
3. Bring everything together to one approach

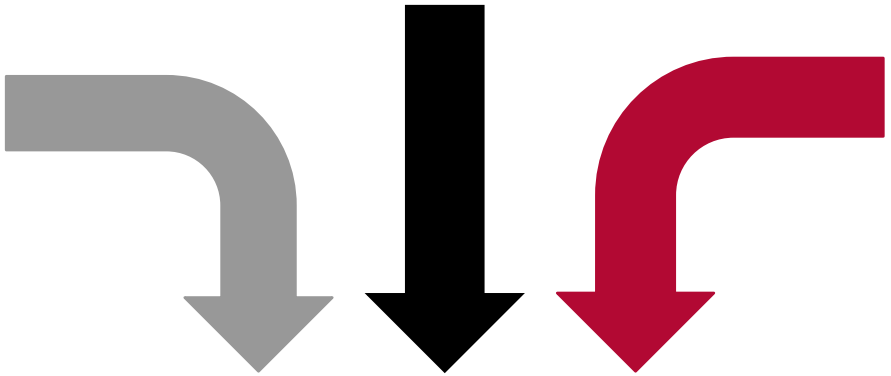
Case 3: Final presentation

Scratch detection and localization algorithm

How does your algorithm work?



Explanation of the approach to detect scratches

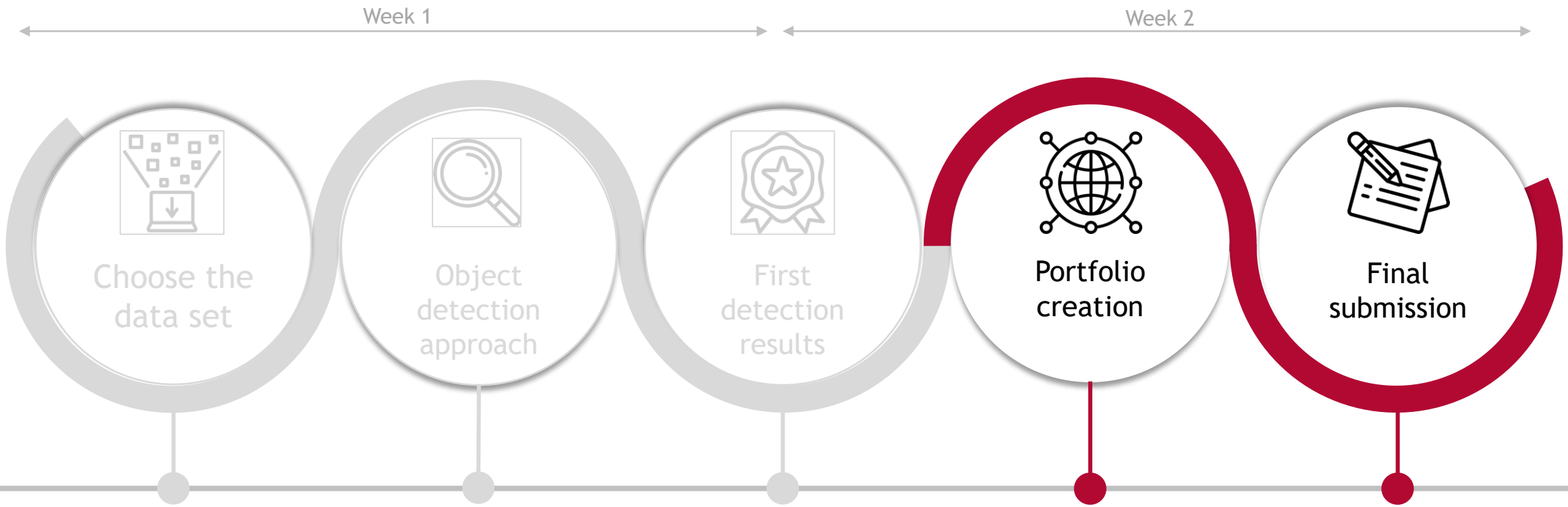


Decision algorithm

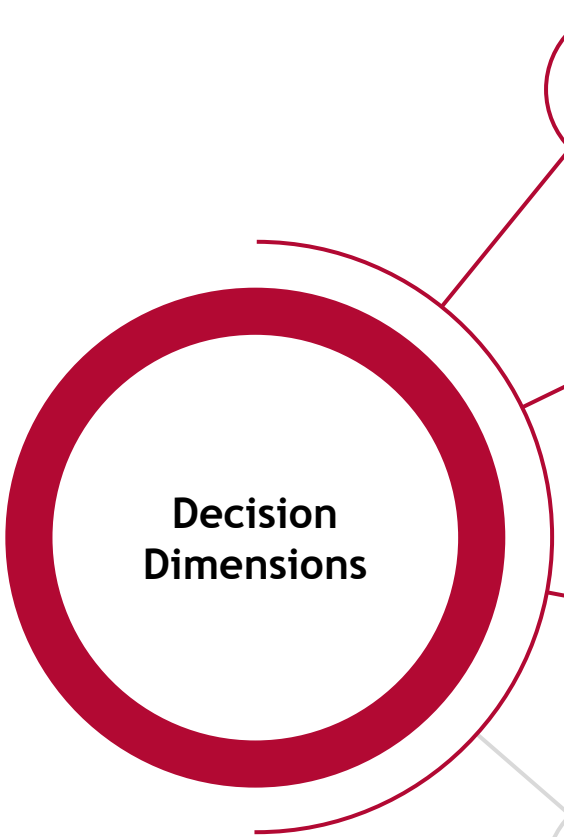
Why do you decide to exchange or correct the specific car parts

Final presentation

Case 3: Time schedule



Case 3: Dimensions of decision-making



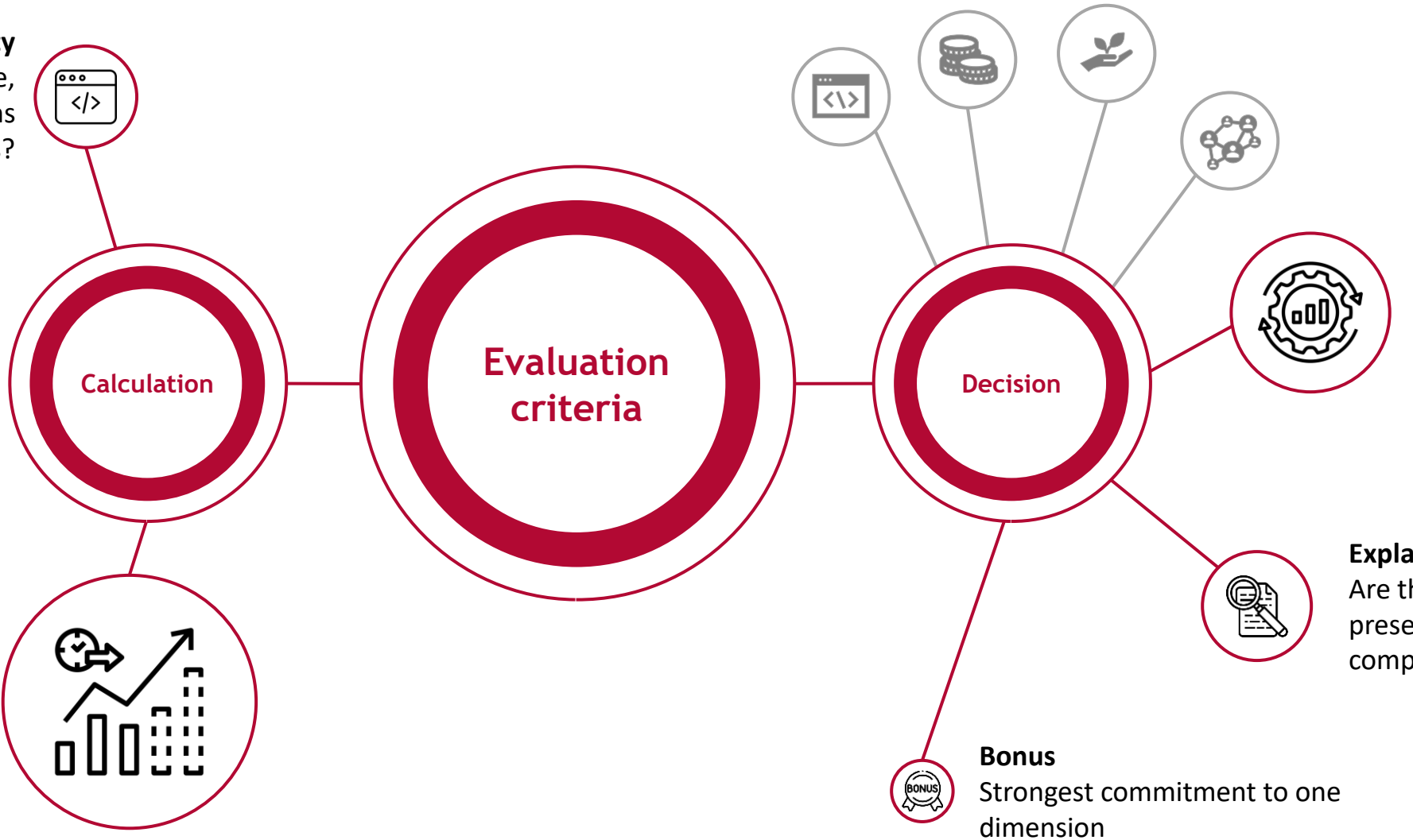
Technical
Evaluates the accuracy of the results. The large is the average price deviation between estimate and reality

Economical
Evaluates economic benefits. We measured over the number of cars that can be repaired with the available funds

Ecological
Evaluates the environmental sustainability. Measures how much CO2 was emitted for the handling

Social
Evaluates the social sustainability. Measures working conditions and social impact

Case 3: Evaluation criteria



Code Quality
Is the code executable, readable and contains comments?

Prediction Quality
How closely do the predictions match reality?

Optimization results
Is an optimal decision made based on the material and CO2 costs?

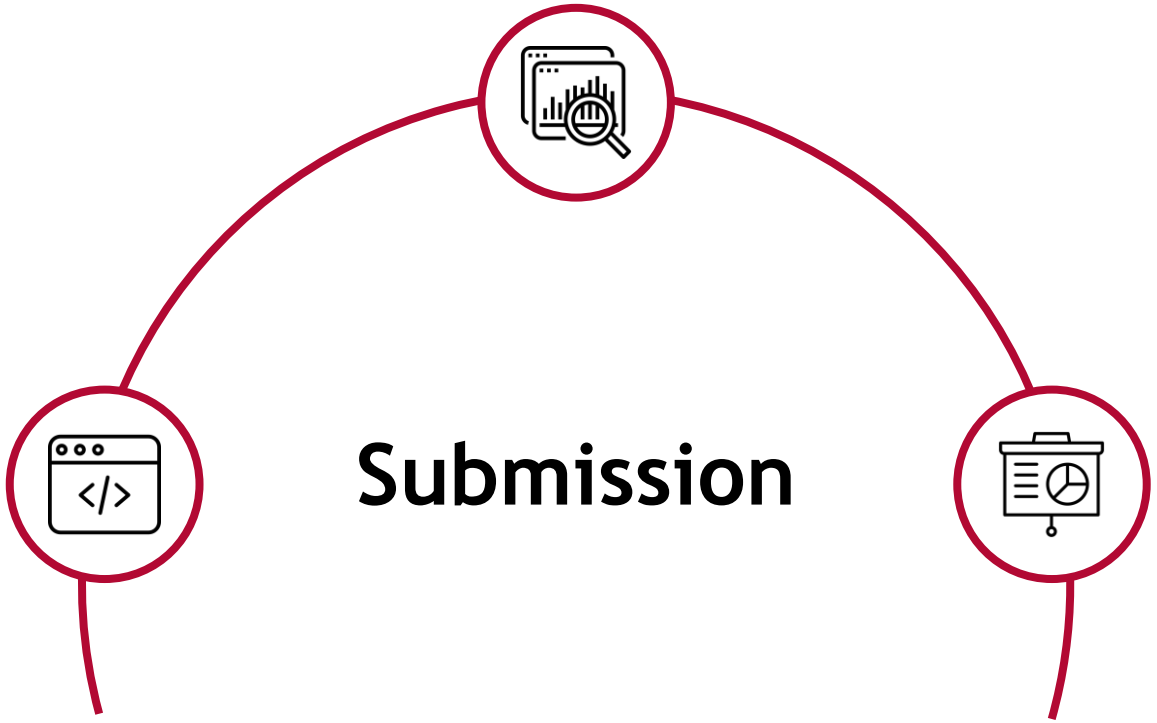
Explanation
Are the decisions made presented in a comprehensible way?

Bonus
Strongest commitment to one dimension

Case 3: Submission

The following files must be sent to s3g@fim-rc.de as a ZIP folder by 02:00 PM on 17.06.2024:

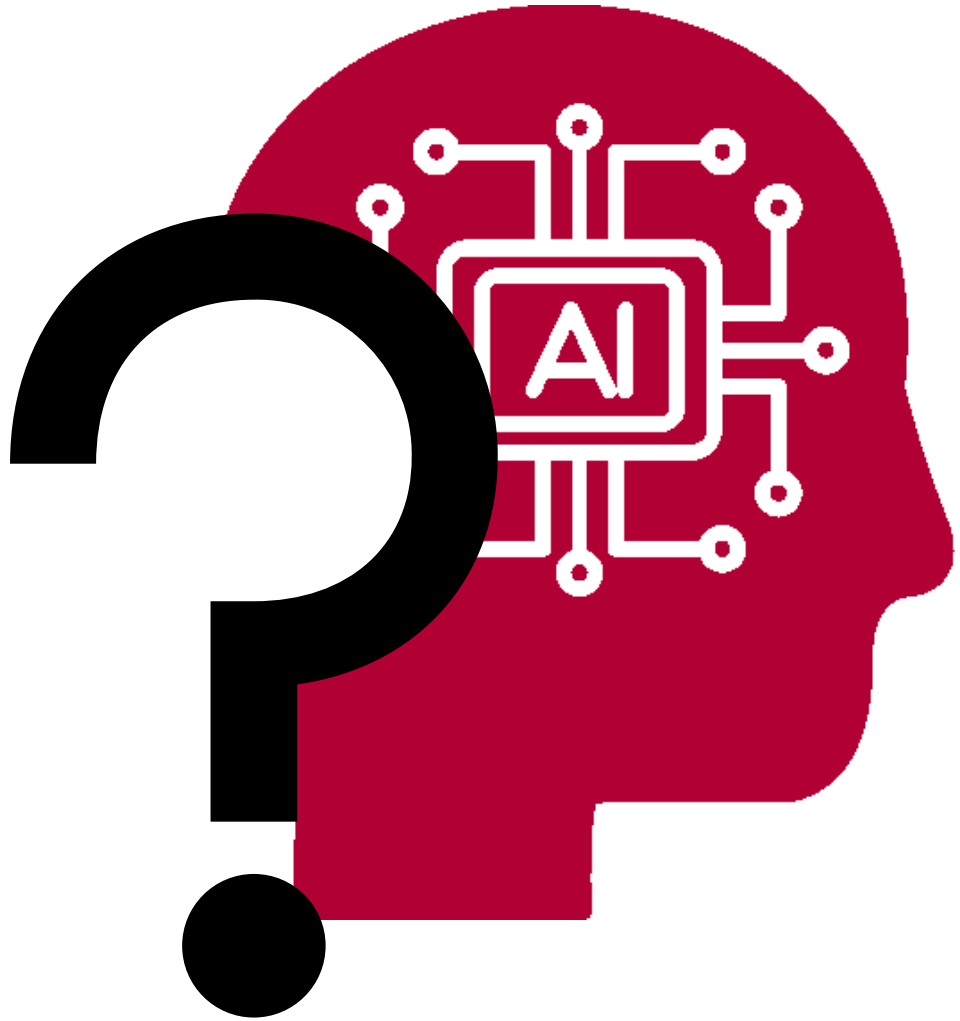
Selection Data
Decision on exchange or correction based on economical and ecological costs for every image



Code
Including both the object detection as well as decision making on exchange or correction

Presentation
Explaining your approach to assignment to car parts as well as decision making

Case 3: Any Questions?



Any Questions?