ADAPTIVE 2024: Towards an Automatized Condition Assessment for Bicycles

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Agenda

- Motivation
- Goal
- Procedure
- Results
- Discussion

Motivation

- The planet's resources are limited.

- For the reduction of resource consumption, it is important to avoid the production of new products and components.

- Repairing is an opportunity to avoid the production of new products.

- Repairing can also extend the lifespan of products.

- An interesting example of a product that can be repaired to extend its lifespan is the bicycle with its many components and a high relevance for mobility solutions.

- At the beginning of the repair process, the question arises which components are exactly in need of repair in order to restore the products' functioning condition.

Goal

- Preliminary goal: The aim of this work is to create a collection of images and data of bicycles.

- Future overall goal: This collection of images will be the basis for training an AI that detects which components are defective with a high probability based on an image.

Procedure: Overview

- **Step 1:** Collecting 115 bicycles via smartphone app.
- **Step 2:** Inspect bicycles using a checklist.
- **Step 3:** Note repair steps.
- **Step 4:** Taking pictures of every bicycle.
- **Future Step 5:** AI Training.
- **Future Step 6:** Testing and Evaluation

Figure 1: Guido Berg: Project partners in front of the bicycles.
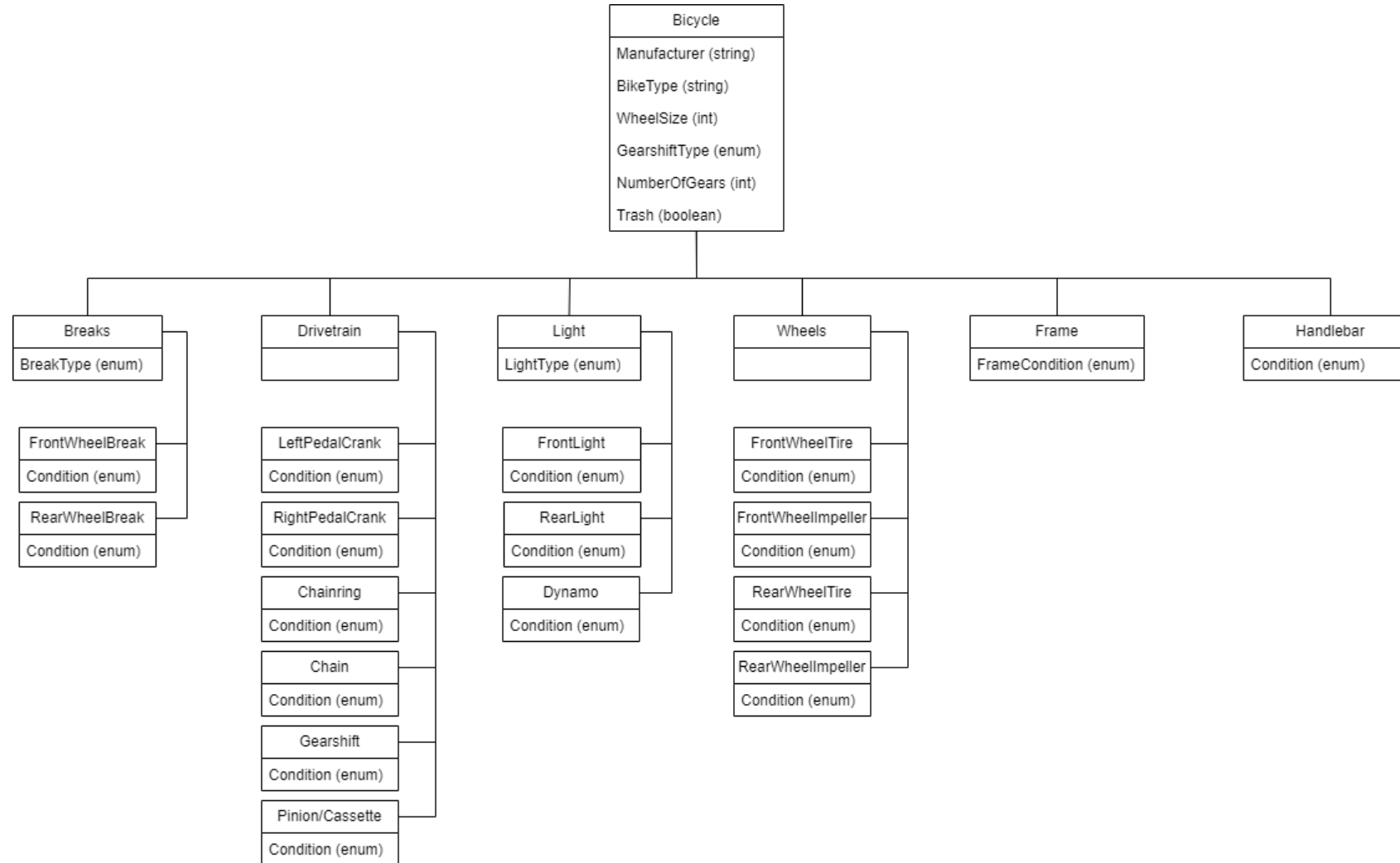
Procedure: Product components for our checklist/PBC

Figure 2: Product components for our checklist

Conclusion

- **Results:**
  - Pictures of the 115 bicycles
  - Completed checklists/PBCs

- **Next steps:**
  - With the help of the checklist/PBC, the pictures will be labeled.
  - The pictures will be used to train a deep learning model.
  - The probability of defective parts being found can then be evaluated.
  - Automated creation of repair instructions.

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Thank you for your attention!