Digitalization & Circular Economy

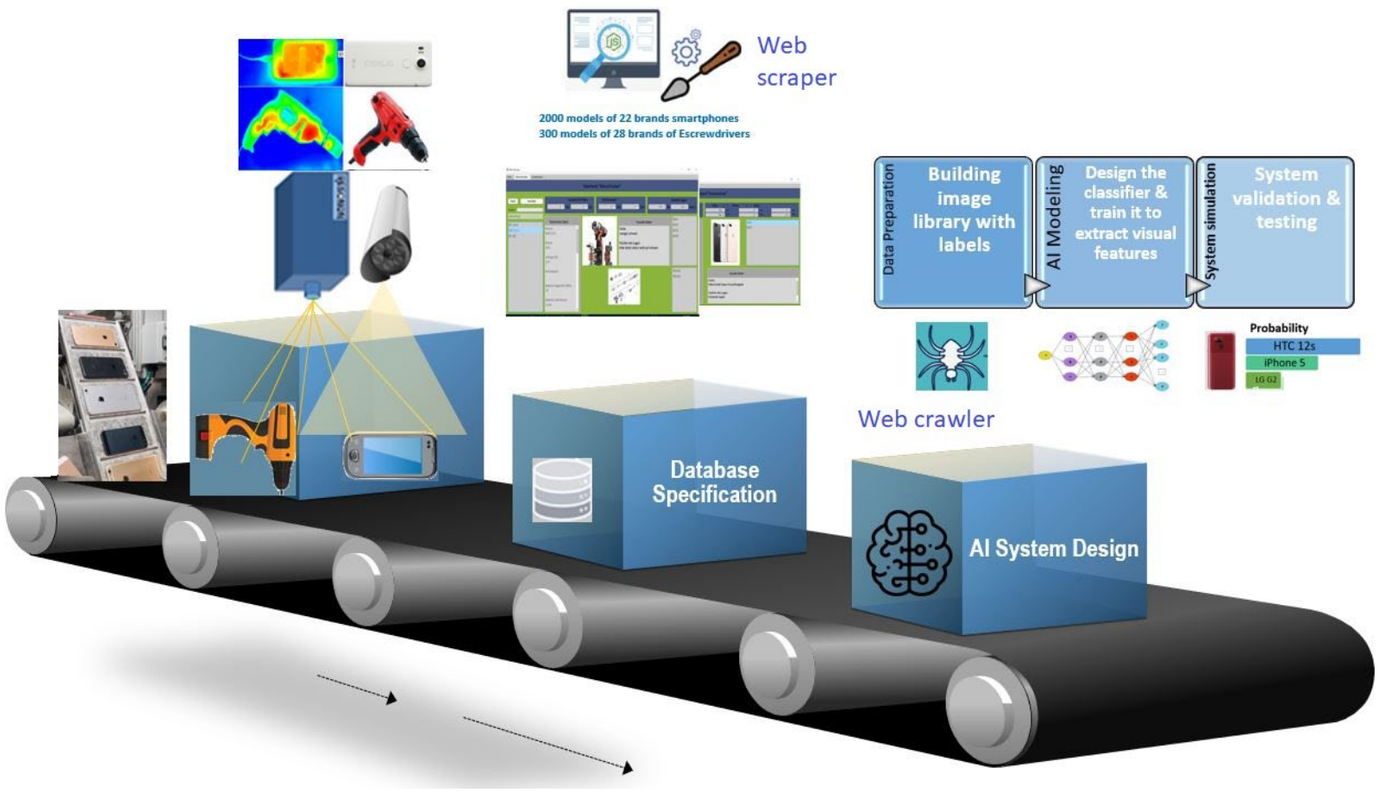
The objective of the project Prosperkolleg is to research the transformation to a circular economy and encourage its implementation. Digitalization in the Prosperkolleg project aims to develop a system that impacts sustainability by utilizing artificial intelligence and multiple sensors to enhance the automation of E-Waste recycling.

The main objectives of the overall project address the following questions:

- What is the type, brand, and model of the recycled device?
- How can artificial intelligence be developed to sort other devices?
- What information could be provided as specification of devices?
- Can multiple sensors reveal more information about the recycled device?

The research work includes:

- Device classification,
- Device specification,
- Using multiple sensors to detect internal components,
- Building datasets semi-automatically,
- Communication with robotics.



The workflow of the suggested model

Transfer learning concept

We propose several techniques for automating the identification of devices in this work: transfer learning as an artificial intelligence method for identifying new device types, brands, and models that need to be recycled, multiple sensors for identifying internal components such as infrared and X-ray, web crawlers that create image datasets by using search engine keywords, and web scrapers that retrieve device specifications, such as dimensions, battery type, visual information, and color options. The model is applied practically and tested in the Circular Digital Economy Lab (CDEL) as a part of the project.

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