

Readme - Research data

Data set title: Module Interface Graph (MIG) for a product family of Robotic Vacuum Cleaners before and after Design for Variety (DfV)

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Context: This dataset contains a Module Interface Graph (MIG) of a robotic vacuum cleaner product family comprising three robot variants. The three variants are combined in one product-family representation and are shown in two design states: before and after Design for Variety (DfV). The data are provided as a two-page PDF.

The graphical dataset covers the main functional areas of the vacuum cleaner robots, including the cleaning system, wheel drives, sensors, navigation components, power supply, housings, user interface and mop attachment. It shows how standard, variant and optional components as well as their interfaces, connections and flows are distributed across the family. This makes similarities, differences and dependencies between the three robot variants visible in a common model.

The function of the MIG in this dataset is to support comparison of the variants and to illustrate how changes to components, interfaces and module boundaries affect the complete product family. The before-and-after comparison demonstrates the effect of DfV and supports the identification of commonality, standardized interfaces and opportunities to reduce internal variety.

The robotic vacuum cleaner family is used as an application example in teaching and research at the Institute of Product Development and Mechanical Engineering Design (PKT) at Hamburg University of Technology. The dataset is also used in workshops and summer schools to introduce and discuss product-family architectures, modularization, Design for Variety and variant management.

Content of this data set:

The content of the data set is listed below in the same order as the files are stored. Files are highlighted with bold font and a short description is given.

- **MIG_RoboVac_README.docx**: This readme file.
- **MIG_RoboVac.pdf**: Two-page PDF containing the graphical dataset.
 - o **Page 1 - Before Design for Variety**: MIG of the product family before DfV.
 - o **Page 2 - After Design for Variety**: MIG of the product family after DfV.

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