ADVANCED MODELING TECHNIQUES FOR
MODEL-BASED PRODUCT CONFIGURATION IN AR APPLICATIONS

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Motivation
Augmented reality (AR) has recently found application in mobile-based product configuration, as exemplified by apps like IKEA Place. However, such apps often focus on the visualization of small changes applied to pre-rendered 3D models of the entire product, thus limiting their ability to adapt to the user’s needs and the physical environment at runtime. Furthermore, this approach is unsuitable for products that display high variability in their physical structure. To solve these issues, a previous master thesis introduced a model-based approach to support AR-assisted product configuration. The proposed approach is based on Dynamic Software Product Lines (DSPL) and facilitates dynamic adaptation by applying the DSPL process (Bashari, 2017) to product configuration and (see Fig. 2) enhancing it with domain knowledge stored in feature models (see Fig. 1). While the main concept is already developed and implemented, there are still open research questions regarding the configuration process (e.g. choosing certain colors or maximum price, detecting objects in the environment) and the platform compatibility (e.g. using the same models for AR and VR applications, fluent transfer between different devices). The goal of this master thesis is to overcome some of these limitations by extending the current concept. The exact scope will be developed in the proposal phase of the thesis.

Task
• Literature Review on DSPLs and AR
• Conception and Design of the Feature Model Editor and the Application
• Prototypical Implementation of the Feature Model Editor (based on Angular) and the Application (based on Unity)
• Evaluation based on a Case Study

Literature