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Automatic generation of UI variants for software product hypothesis validation

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Background

Software product decisions should be made based on data [1]. Continuous Experimentation is a software product development approach that uses field experiments and promotes data-based decision making [2]. However, experimenting with different UI variants requires designing and implementing multiple UI variants which may not be feasible due to time and resource limitations. Furthermore, only a subset of possible variants are feasible for user experiments.

How to reduce the time and cost required to build relevant experimental UI variants?

Research goal

Investigate automatic generation of UI variants that conform to a design system and given experimental hypothesis.

RQ1: What are the requirements for an AUI that can be used for both variant generation and code generation?

RQ2: How to codify a ruleset that can be used to control the variant generator?

RQ3: Is there a ruleset that produces a range of relevant UI variations?

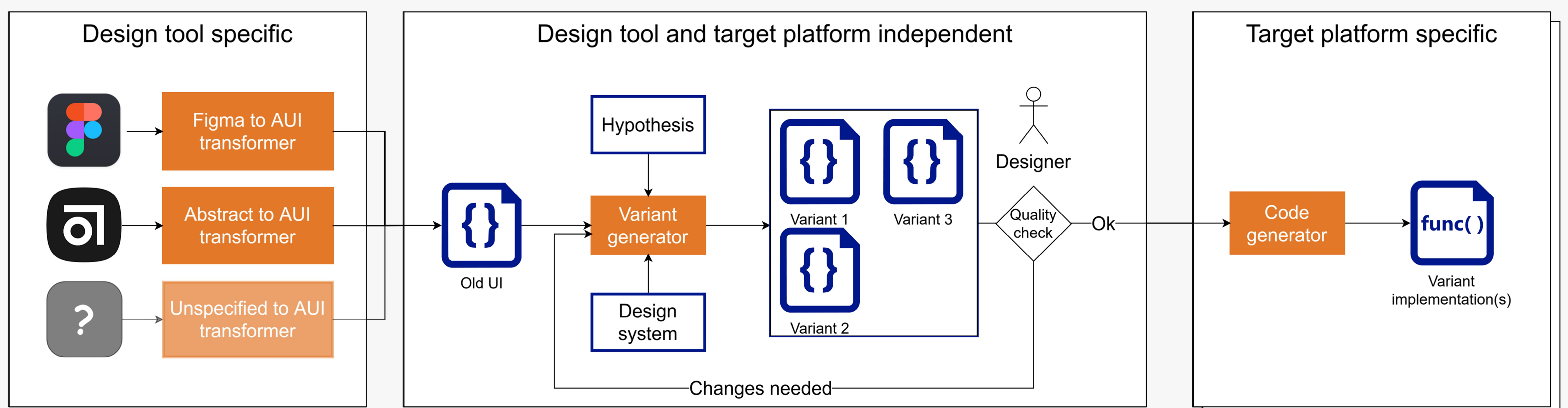
RQ4: Which parts of the process could benefit from a human expert in the loop?

Normalize design data from design tools into an abstract UI representation format (AUI)

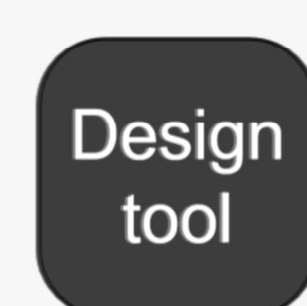
Generate new AUI variants based on original design, design system defined restrictions, and experimental hypothesis

Allow human operator to steer the variant generation process

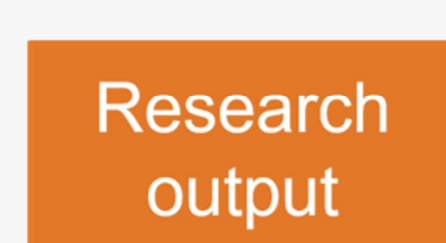
Automatically generate UI code from an AUI representation



Legend



Design tool



Research output



Abstract UI (AUI)
Representation object



Input artifact



Output artifact (code)

Method

The research is going to use a **design science study** method that can be used to build a solution through an iterative process of problem conceptualization, solution design, and empirical validation.

Case study method may be used to collect data for problem conceptualization as well as in empirical validation of potential solution designs.

Contact info

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References

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- [2] Fagerholm, F., Sanchez Guinea, A., Mäenpää, H., & Münch, J. (2017). The RIGHT model for Continuous Experimentation. *Journal of Systems and Software*, 123, 292–305. <https://doi.org/10.1016/j.jss.2016.03.034>