

FROM IDEAS TO NEEDS: GENERATING REQUIREMENTS USING SKETCHES

SPEAKER: NICHOLAS SPIVEY

In engineering design, the classic methodology of the design process encourages the problem definition to be thoroughly developed prior to beginning concept generation. It is shown, however, that the problem definition and solutions must coevolve throughout the design process, each phase building off information learned from the other to develop in an iterative process. The current structuring of these steps leads to a disconnect between a designer's final solution and their initial problem definition (often presented in the form design requirements). This research explores a methodology for improving the connection of design requirements to those final solutions through manipulation of the ordering of the design process. An experimental study was conducted to assess 104 engineering students' requirements lists for a given design problem as they are influenced by developing requirements first versus sketching an initial concept prior to requirement generation. The "sketch first" group was then asked to use their sketch to assist their requirement generation. Additionally, a second "sketch first" group was tested to determine the influence of being given explicit instructions to identify features of their sketch to further improve the requirements generated. It was found that this feature identification aspect of sketching leads to improved requirements lists based on several metrics used to evaluate requirements, while simply changing the order of requirement generation and sketching had little or no effect. This indicates that the design process should explicitly connect a solution to the design requirements through formal instruction in order to improve the designers' understanding of their goal.

MONDAY, OCTOBER 21 3:00 PM

EIB 132