Virtual Reality, Data Visualization, and Optimization: Building Better Decision Tools for the Design of Complex Engineered Systems

Many technological advances are responsible for enabling advanced visualization methods, such as virtual reality (VR), augmented reality (AR), and mixed reality (MR), to become pervasive not only in high-end research labs but in many commodity devices such as mobile phones, desktop computers and gaming devices. Humans are able to visualize and interact with more data, in new and exciting ways, than ever before. These advancements are fundamentally changing engineered products from their design to how they interact with customers. In this talk I will describe research projects that: 1) use VR, in combination with heuristic optimization, to provide a method to quickly modify the flight path of an Unmanned Aerial System (UAS) and 2) use parallel computing, self-organizing maps (SOMs), and clustering methods to produce novel representations of design data to aid in trade-off decision-making.

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