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Interactive Sketch-based Interfaces and Modelling for Design

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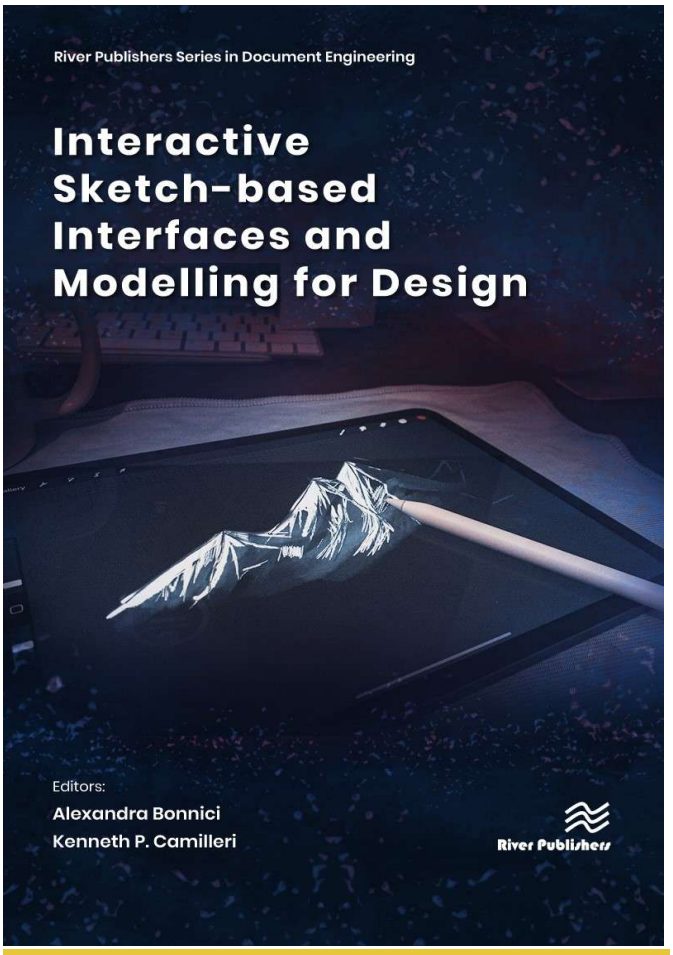
Sketching is a natural and intuitive communication tool used for expressing concepts and ideas that are difficult to communicate through text or speech alone. In design applications, drawings are used at various stages of the design process: from the early concept drawings scribbled on a piece of paper to immersive interactions in which users manipulate and adjust the 3D form of an object in virtual or augmented reality environments. This variety in drawing activities brings about the need for different interpretation strategies that support not only the sketching activity itself, but also allow sketch-based interactions, such as sketch-based queries, to take place. In this book, we explore the different drawing approaches used in design and the algorithms required for processing and interpreting the different sketches and drawings in design.

The book is divided into two parts. The first part focuses on sketching in the 2D domain. This includes the digitization of offline and paper-based sketches, techniques for online sketch recognition, observations of user drawing habits, algorithms for inferring depth from 2D drawings, as well as non-photorealistic rendering techniques that are then applied to sketch-based queries. The second part of the book focuses on 3D sketching in virtual or augmented reality spaces. Here, we present the processing and rendering of the 3D strokes, the different interaction devices available for 3D sketching, and look at different applications where immersive 3D sketching has been applied with success.



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