Computational Design of Reconfigurables Akash Garg, Alec Jacobson, Eitan Grinspun



reconfigurable | riːkənˈfɪg(ə)rəb(ə)l | noun

an object or collection of objects whose transformation between various states defines its functionality or aesthetic appeal.

- A foldable bicycle is a classic example of a reconfigurable.
- A space-saving apartment full of furniture is also a reconfigurable.



Problem: Transitions between states need to be collision free. Traditional CAD and modeling tools rely on manual scrubbing and trial-and-error.



Solution: Design tool with user interfaces and computational assistance dedicated to reconfigurables. User freely explores alternate solutions.





User interfaces







Occluded view





Optimized view



Untangling in space-time





Swept-volume carving





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Inputs





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tangled space-time surfaces