



Home ▾ Projects ▾ Information and Communication Technologies ▾ Automated Computational Design and Assembly Instructions for Interlocking Bricks

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Automated Computational Design and Assembly Instructions for Interlocking Bricks

#Construction

#Automation

#2019



This project has developed the very first computer algorithm to automatically generate an optimized LEGO® Technic™ model with assembly instructions in only a few seconds from a simple sketch by the user. Building toys, including LEGO®, Erector Sets®, Lincoln Logs® and many other construction toys, contain interlocking bricks of different shapes to deliver high functionalities and fun. Currently, assembly instructions of models are typically designed by professional designers through months of efforts, trials and errors in choosing the types of bricks, connectedness, mechanical structures, etc. LEGO® Technic™ is one of the systems to build advanced models with real-life functions like gearboxes and bow.

Uniqueness and Competitive Advantages:

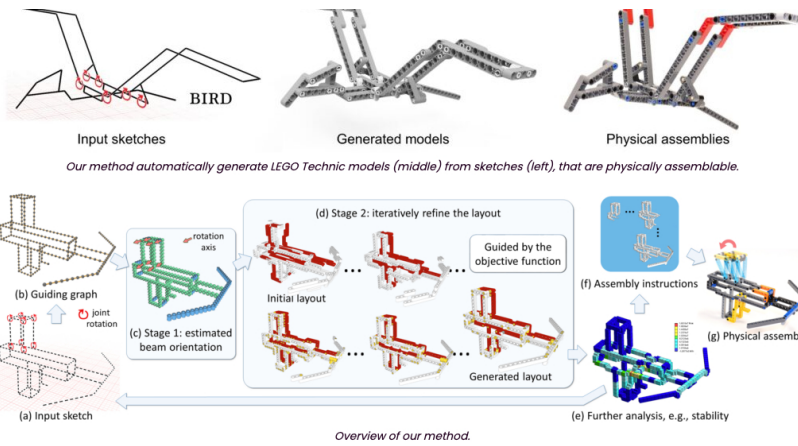
- A comprehensive system to design models with stability, symmetry, balance, connectedness and assembly instructions
- A system that helps ordinary people and professional designers to design LEGO® Technic™ models simply by sketching
- A computational method that can be extended to not only many kinds of interlocking blocks, but also architecture, bridge and mechanical design



A photograph showing the physical assemblies of LEGO Technic models generated by our method.



AIRPLANE



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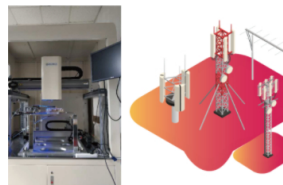
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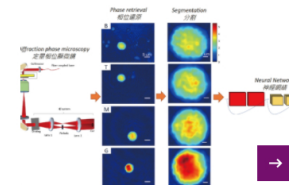
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