

Presentation - DNA Origami Project

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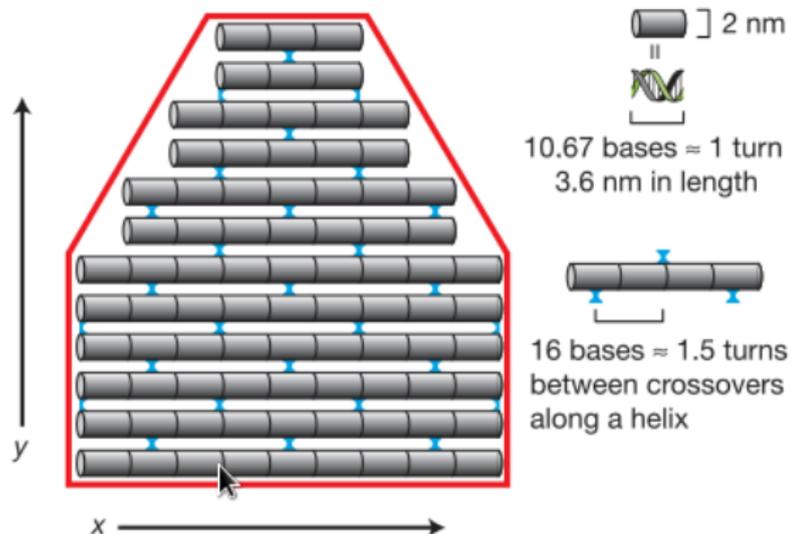


Introduction

- ▶ Goal : Design shapes with DNA origami.
- ▶ Tools :
 - ▶ Cadnano
 - ▶ Maya
 - ▶ CanDo
- ▶ Outline :
 - ▶ The principle
 - ▶ Our design

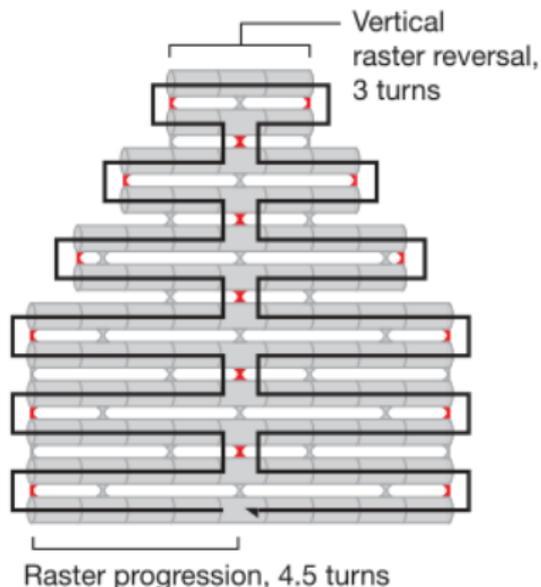
The principle

- ▶ Step 1 : Build the geometric model by reconstructing the desired shape with rectangles.
- ▶ Step 2 : Add one crossover every $k = 16$ bases.



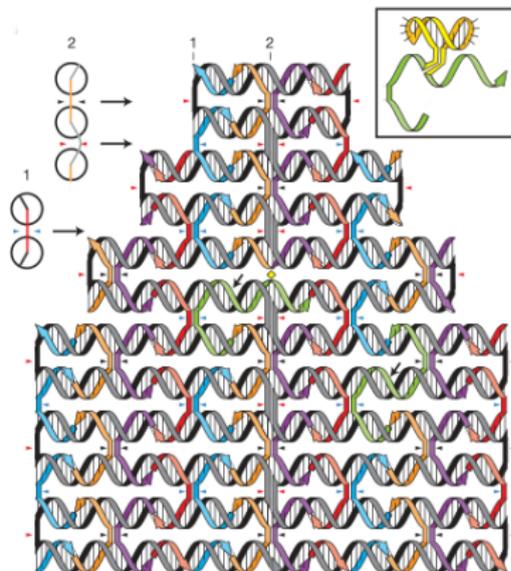
The principle

- ▶ Step 3 : Design the scaffold strain and add its corresponding crossovers.



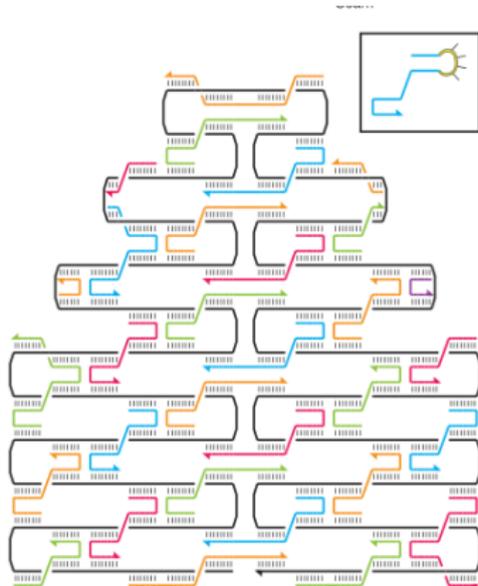
The principle

- ▶ Step 4 : Design the other portions of strains, the staples, taking into account the crossovers.

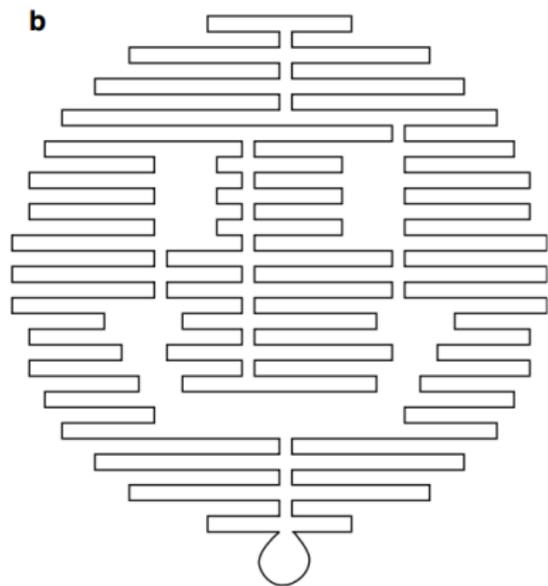
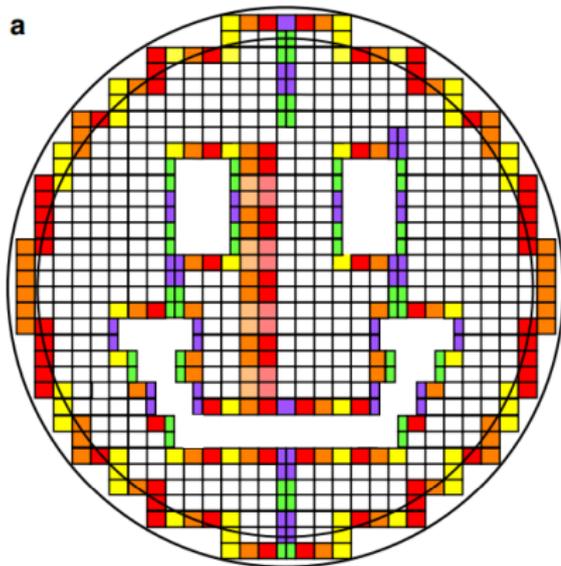


The principle

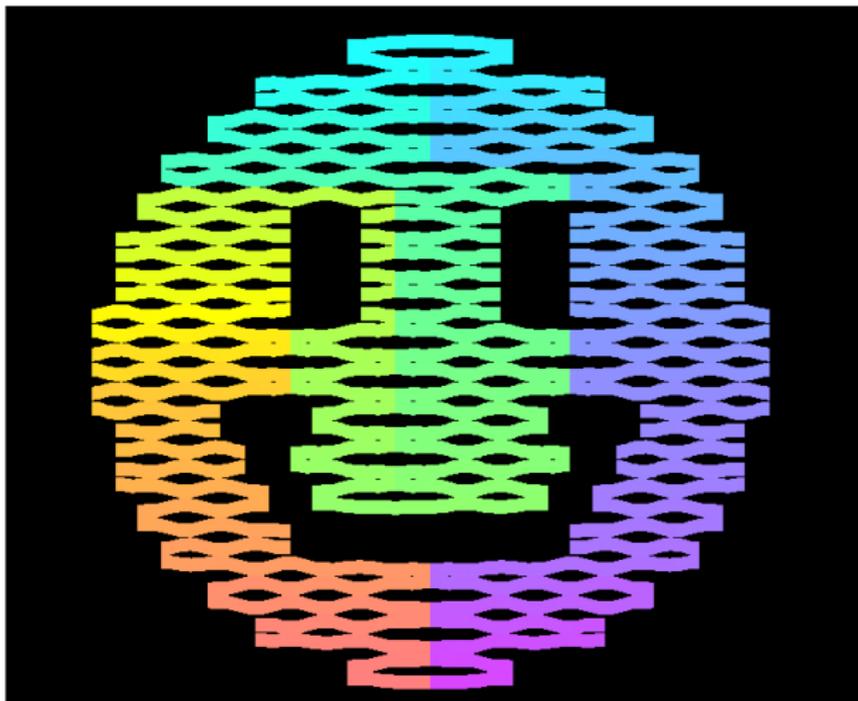
- ▶ Step 5 : Merge adjacent staples when possible.
- ▶ Step 6 : Sequence the scaffold, create the staples as its complements.



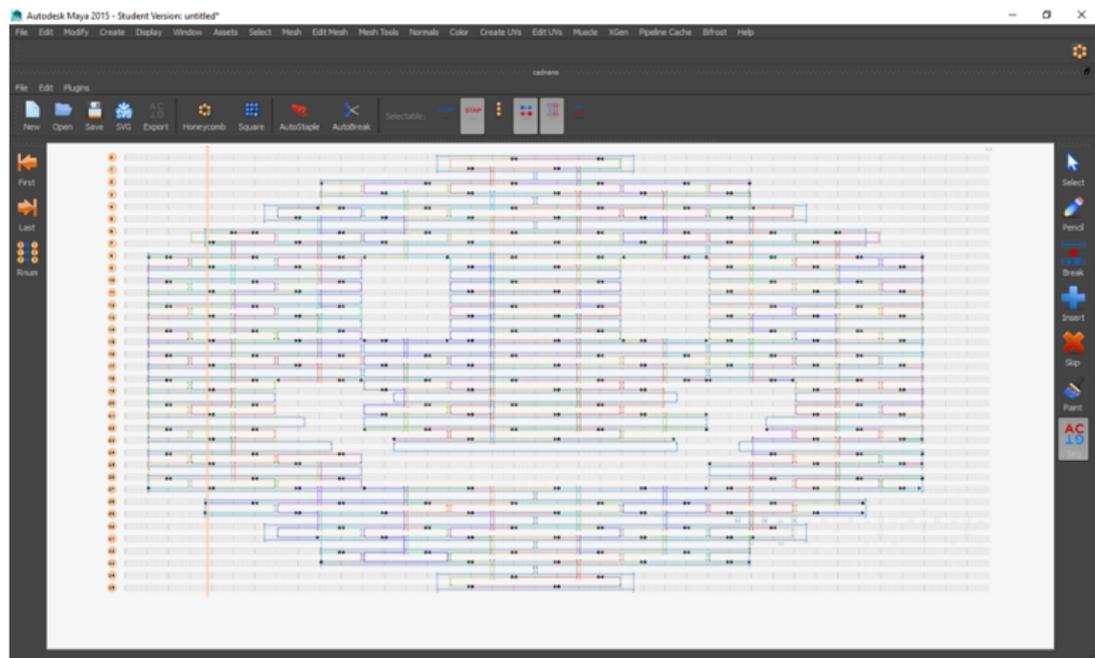
Our design



Our design



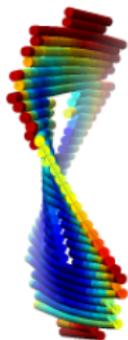
Our design



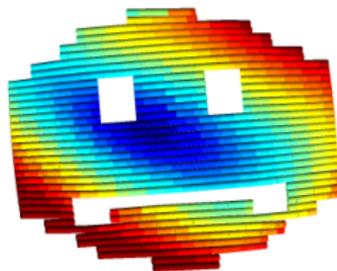
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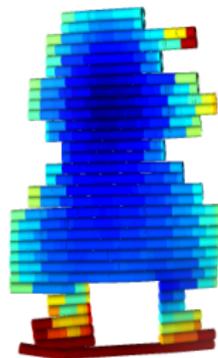
Our design



Sad smiley



Mario



References

- ▶ Rothemund, P. W. (2006). Folding DNA to create nanoscale shapes and patterns. *Nature*, 440(7082), 297-302.
- ▶ Rothemund, P. W. Folding DNA to create nanoscale shapes and patterns Supplementary Notes 1–11.