Escher Tile Deformation via Closed-Form Solution

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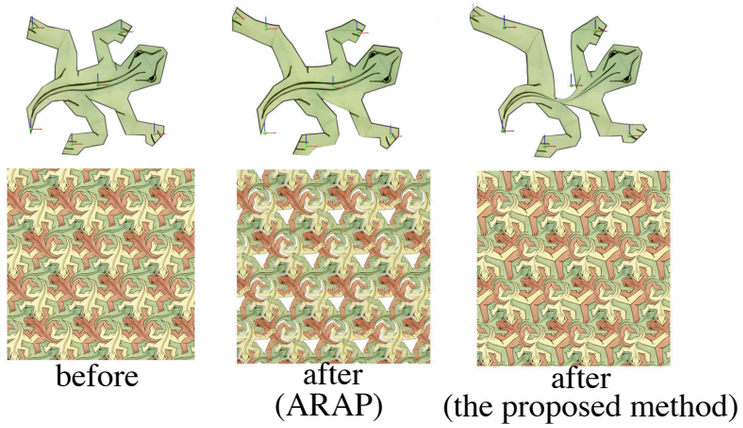
project page

Project Goal

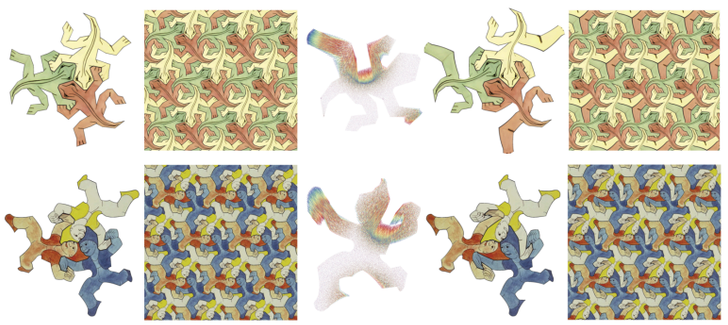
- **Inputs:** tessellation + point handle control
- **Outputs:** deformed tessellation
- **Constraints:**
  1. tileability (no gap/overlap)
  2. respecting user input

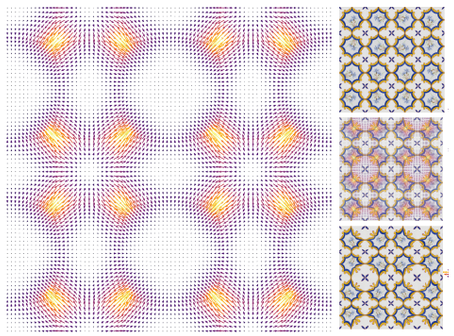


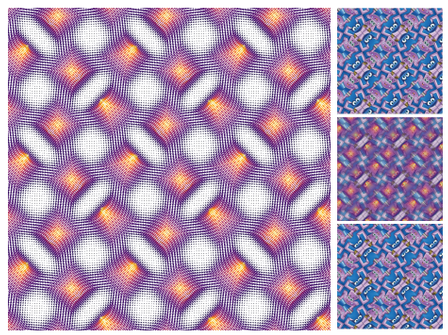
before | after (ARAP) | after (the proposed method)

Key Ideas

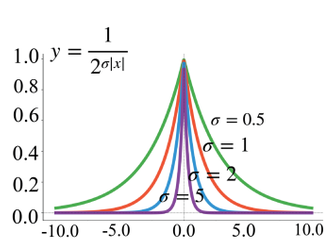
- **The displacement fields needs to be <u>periodic functions.</u>**

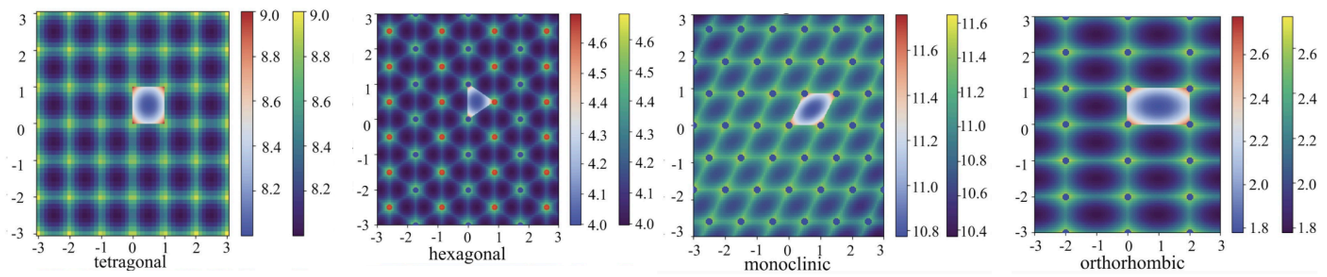




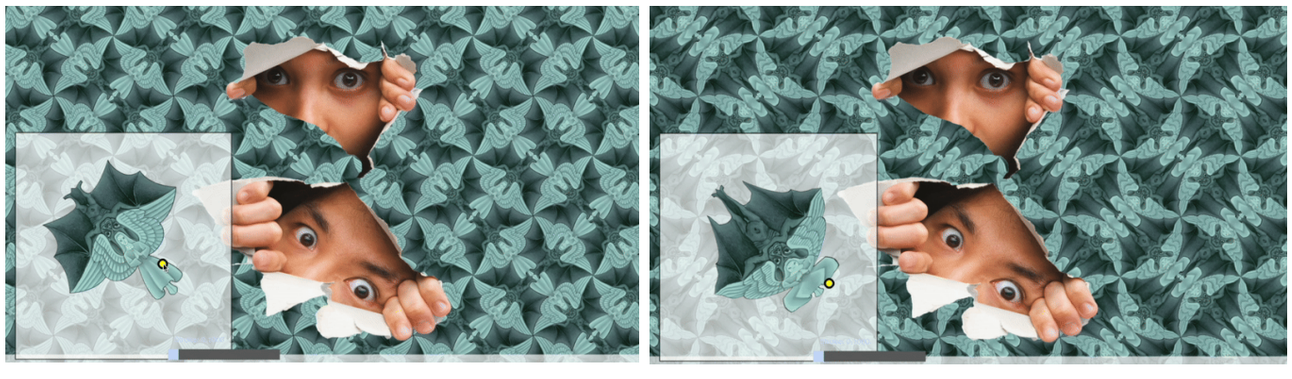


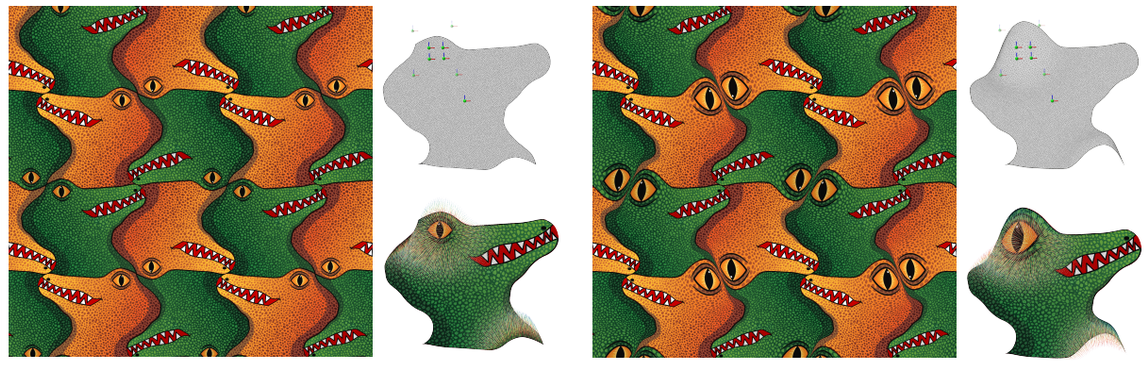
- **<u>Mathematical series</u> is employed to integrate the guidance field <u>analytically.</u>**





Results

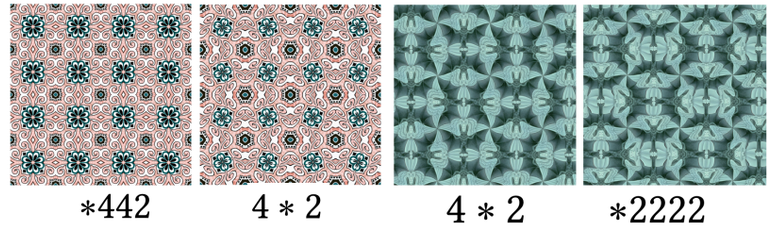




Interesting Unsolved Problem!

Examples: If I feed a *442 pattern into a 442 deformer, I get a 4*2 as result.
If I feed a 4*2 into a 2222 deformer, I get a *2222 as result.

A thorough theory and the corresponding software for **<u>symmetry downgrading</u>** using the concept of group and subgroup is yet to be proven and created.



*442 | 4 * 2 | 4 * 2 | *2222