

Scenario Week 2

COMP214P

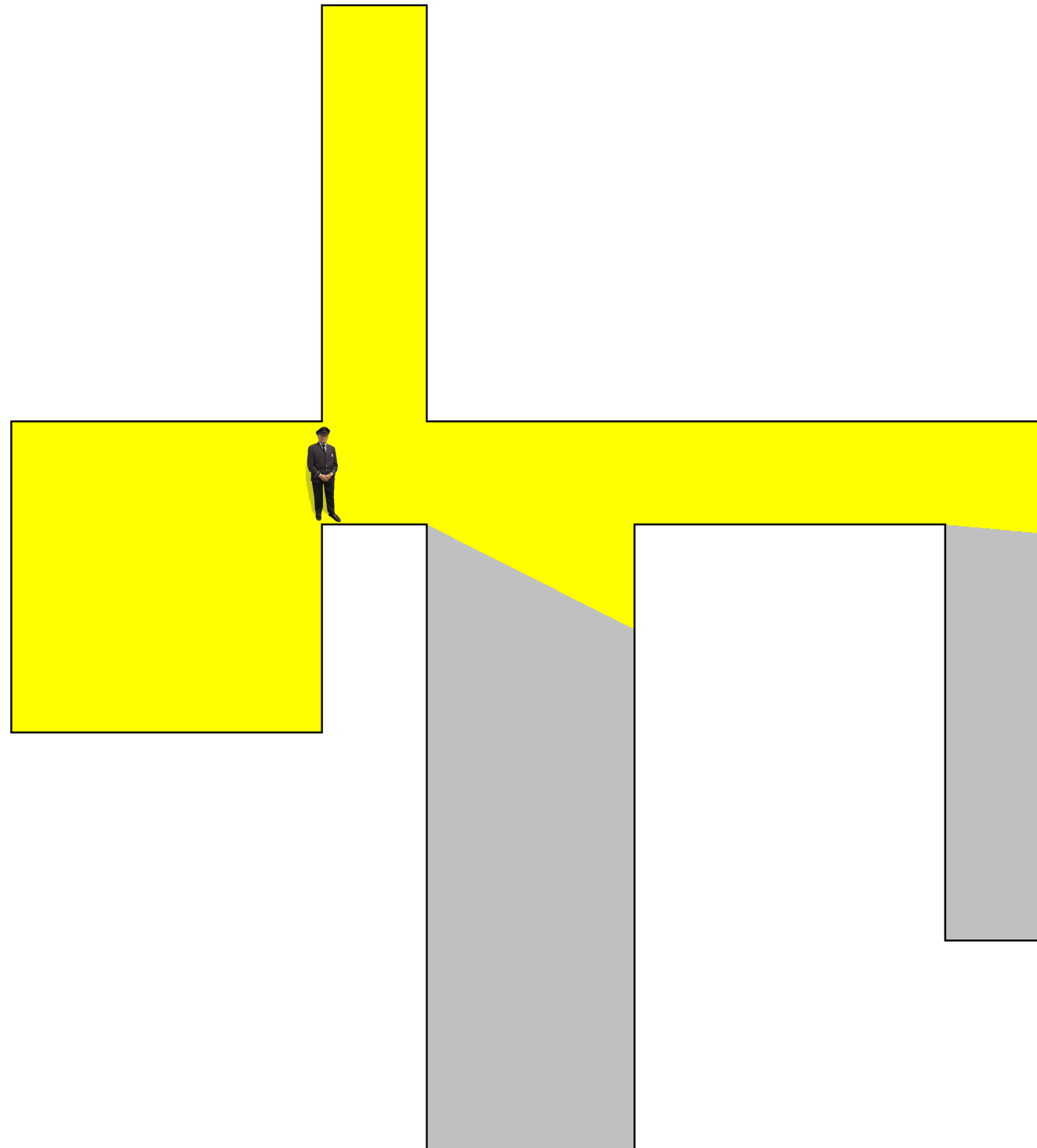
Organisers' Report

`scenario@cs.ucl.ac.uk`

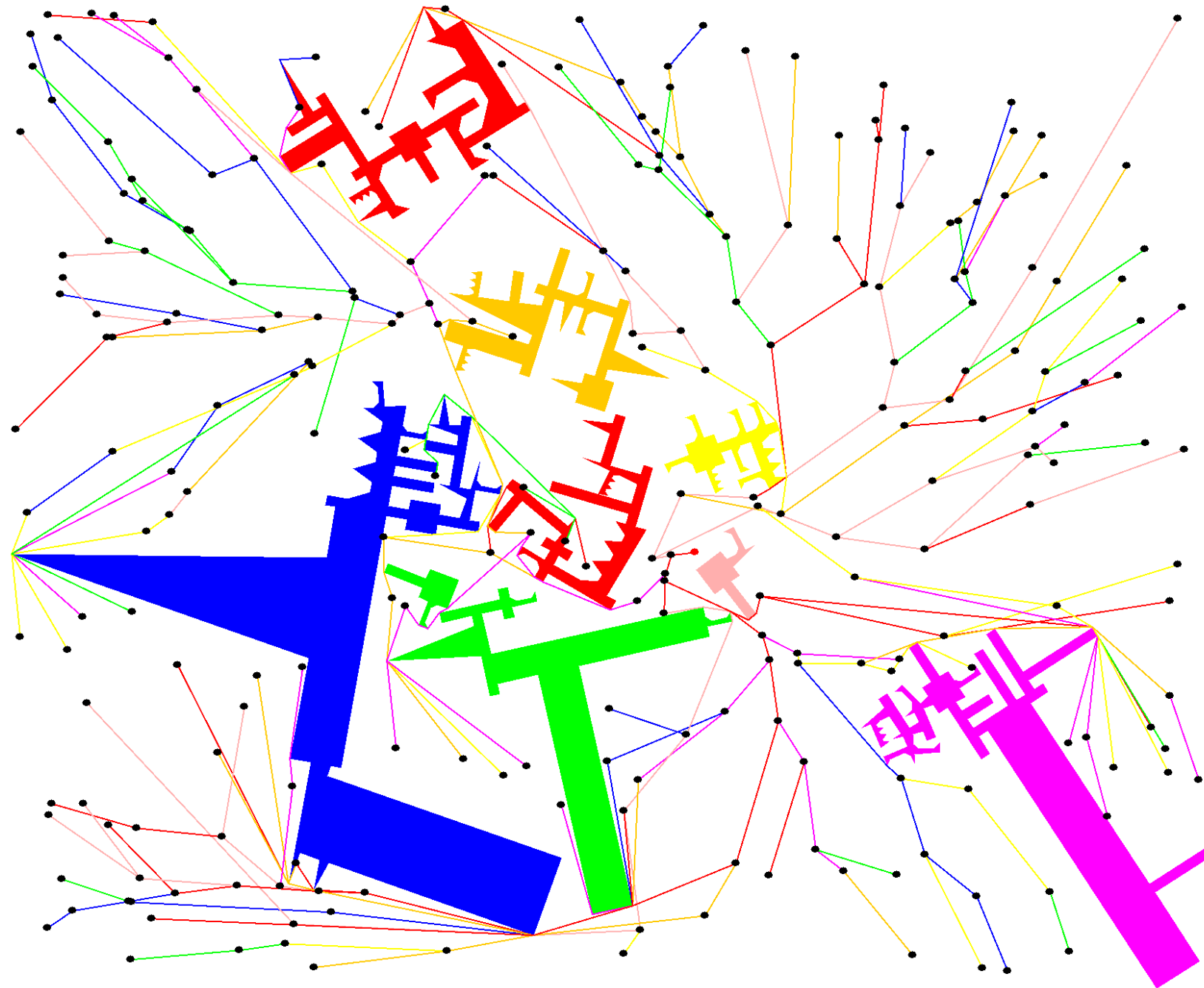
15 December 2017

Geometry Scenario Weeks

February 2016



February 2017



This Week

Organisers



Gilles Rainer



Carlos Gavidia



Lilia Anisimova



Thomas Sibut-Pinote



Ilya Sergey

Organisers



Gilles Rainer



Carlos Gavidia



Lilia Anisimova



Thomas Sibut-Pinote



Ilya Sergey



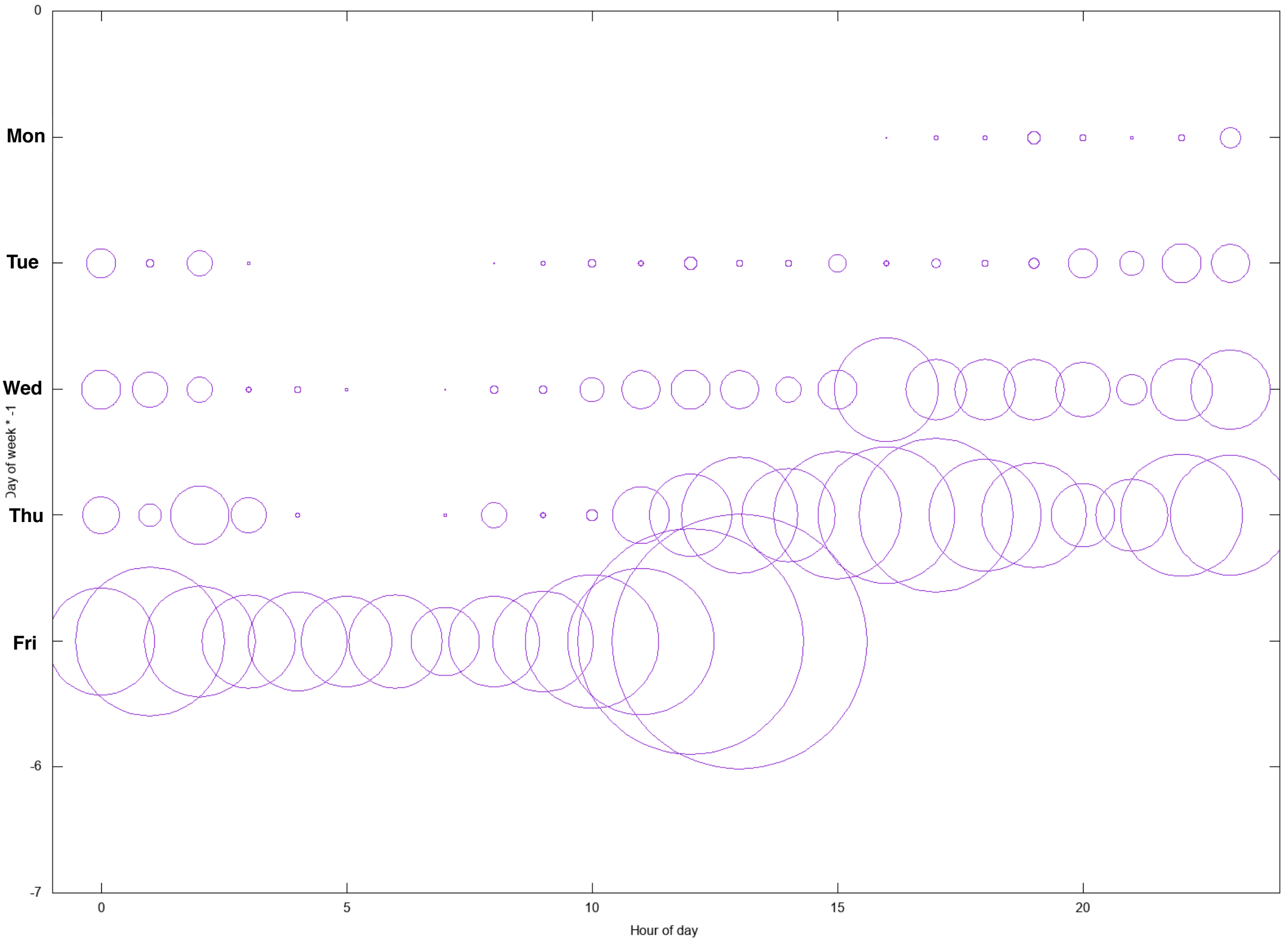
Torpe

Participants

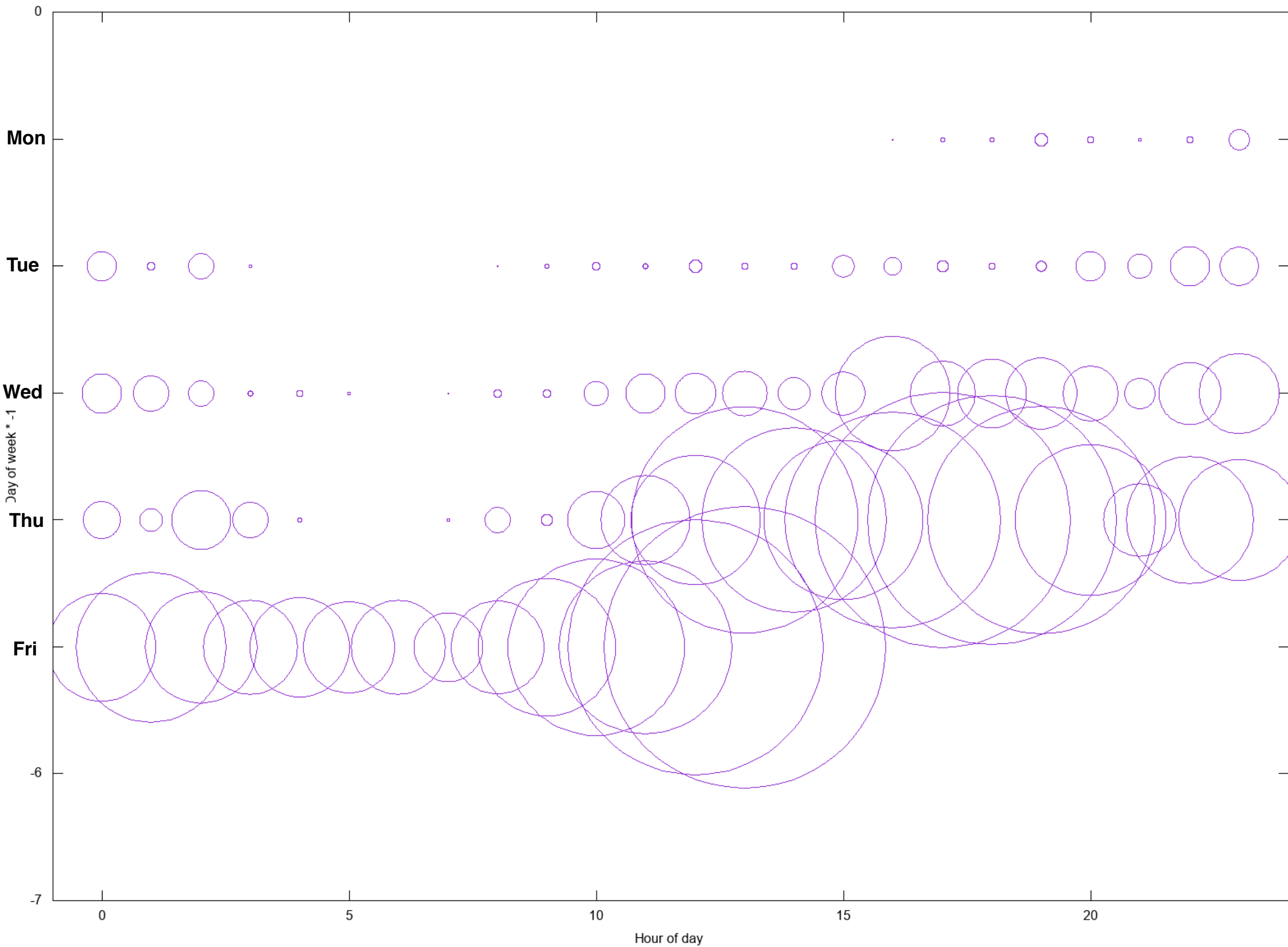
- **116** participants
- **30** teams
- **100** hours for hacking
- **15** teams solved *all* problems
- **4454** submissions, ~**290** MB of data
- The largest number of submissions by one team: **879**
 - Second largest: **422**

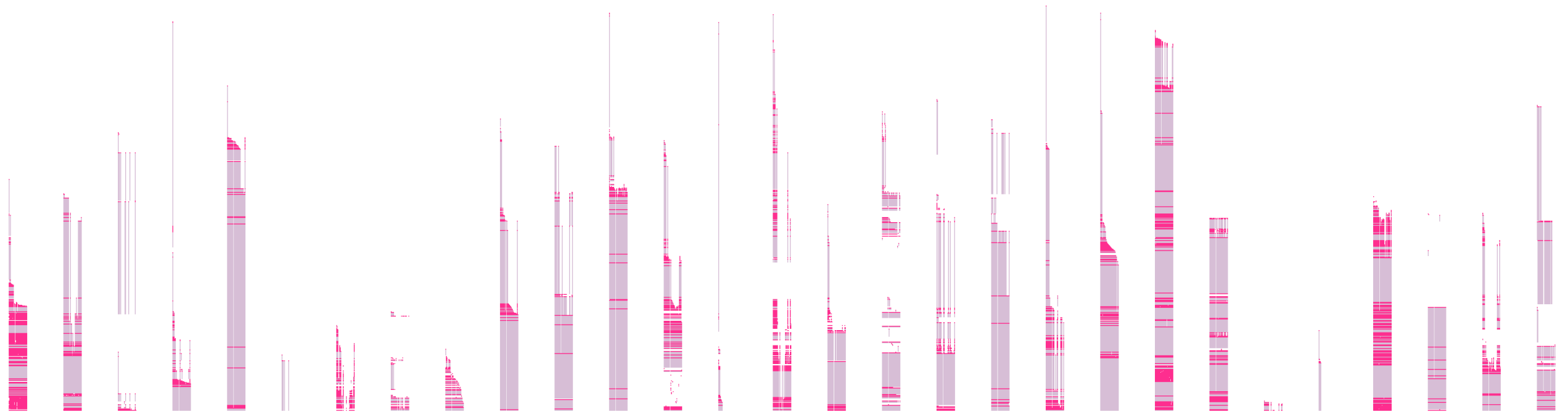
Behind the Scenes

Number of submissions per timeslice: Team all

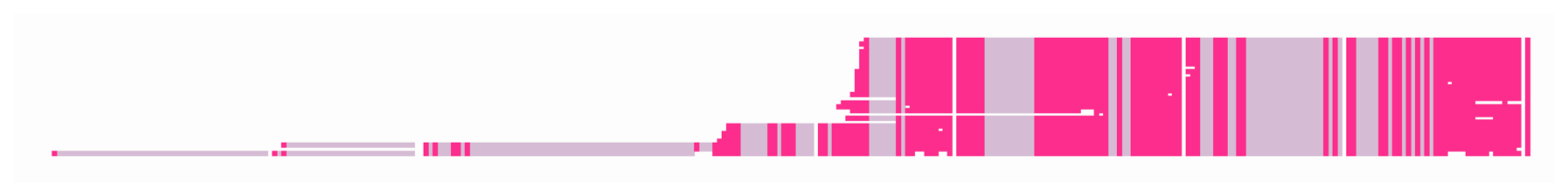
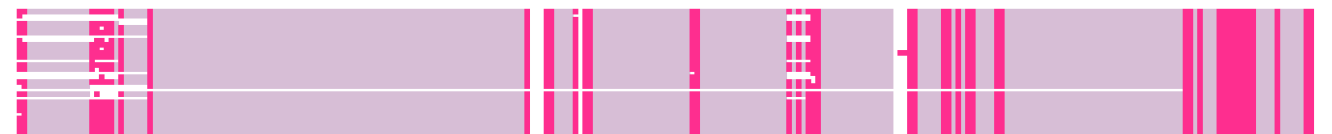


Number of submissions per timeslice: Team all

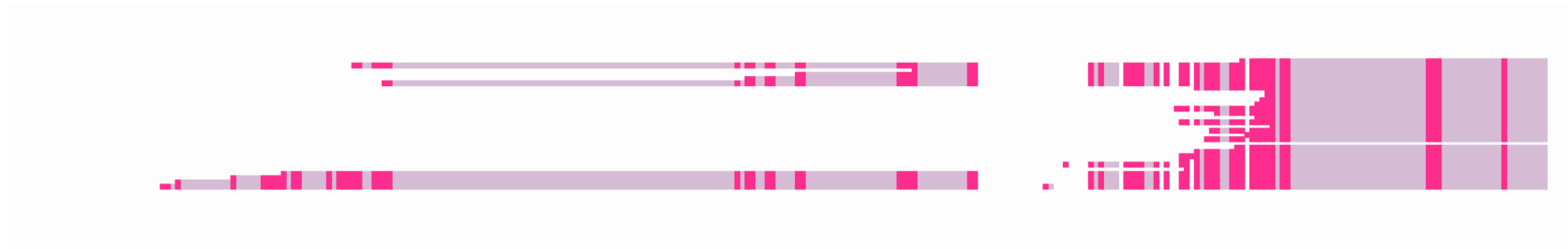




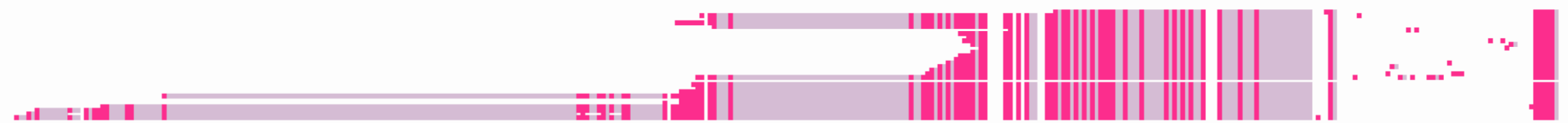
Hours

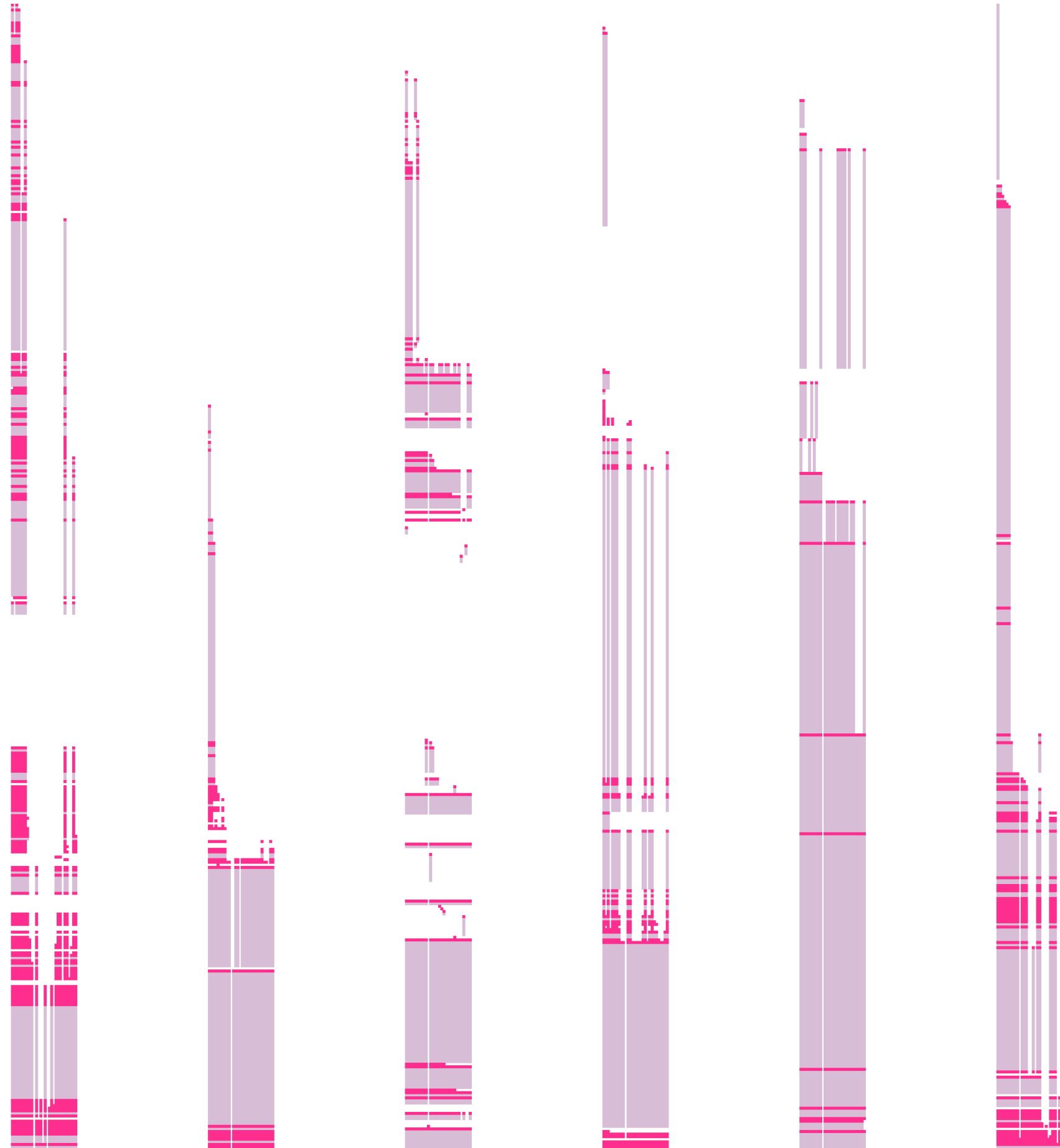


Hours



Hours

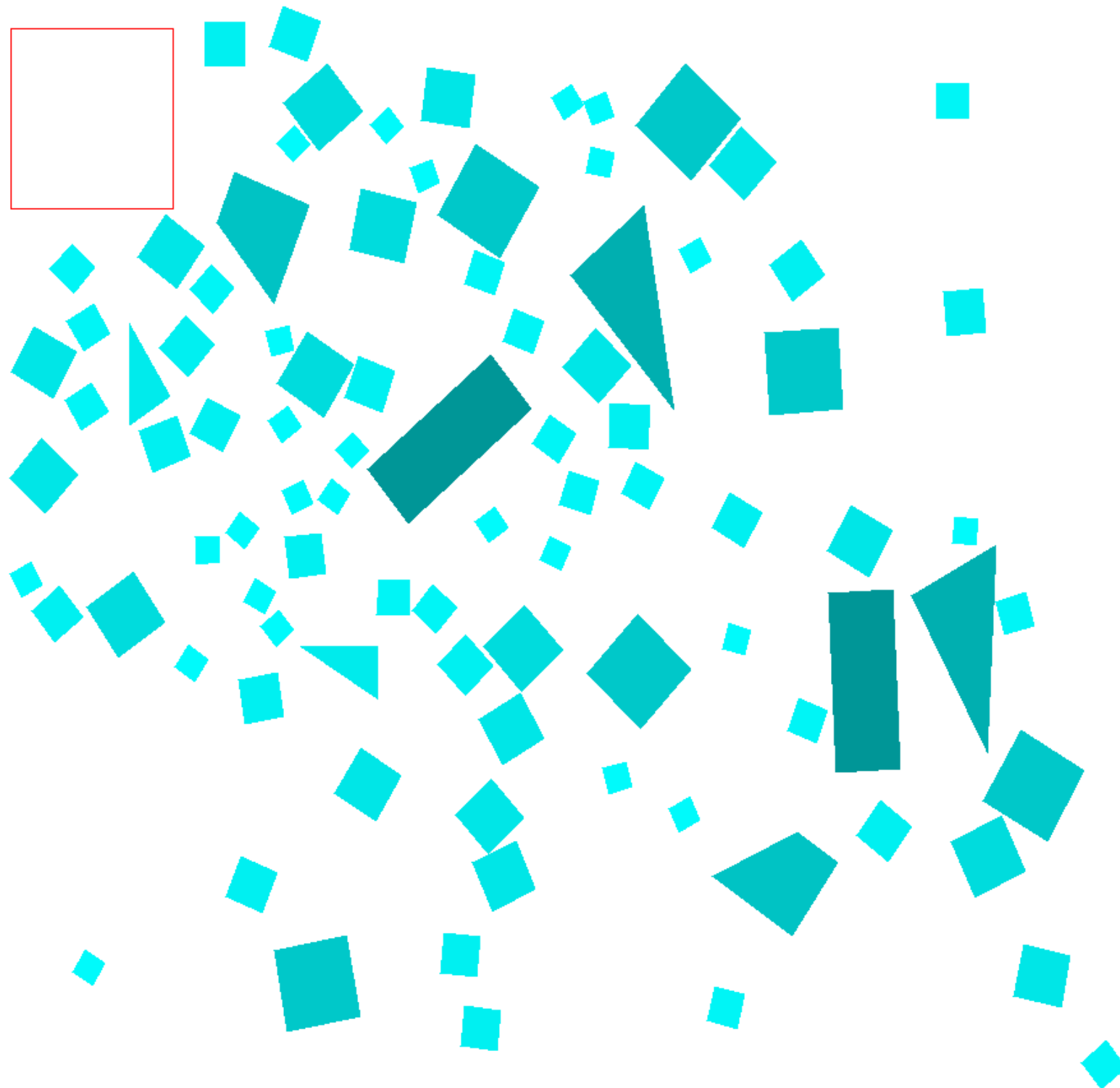




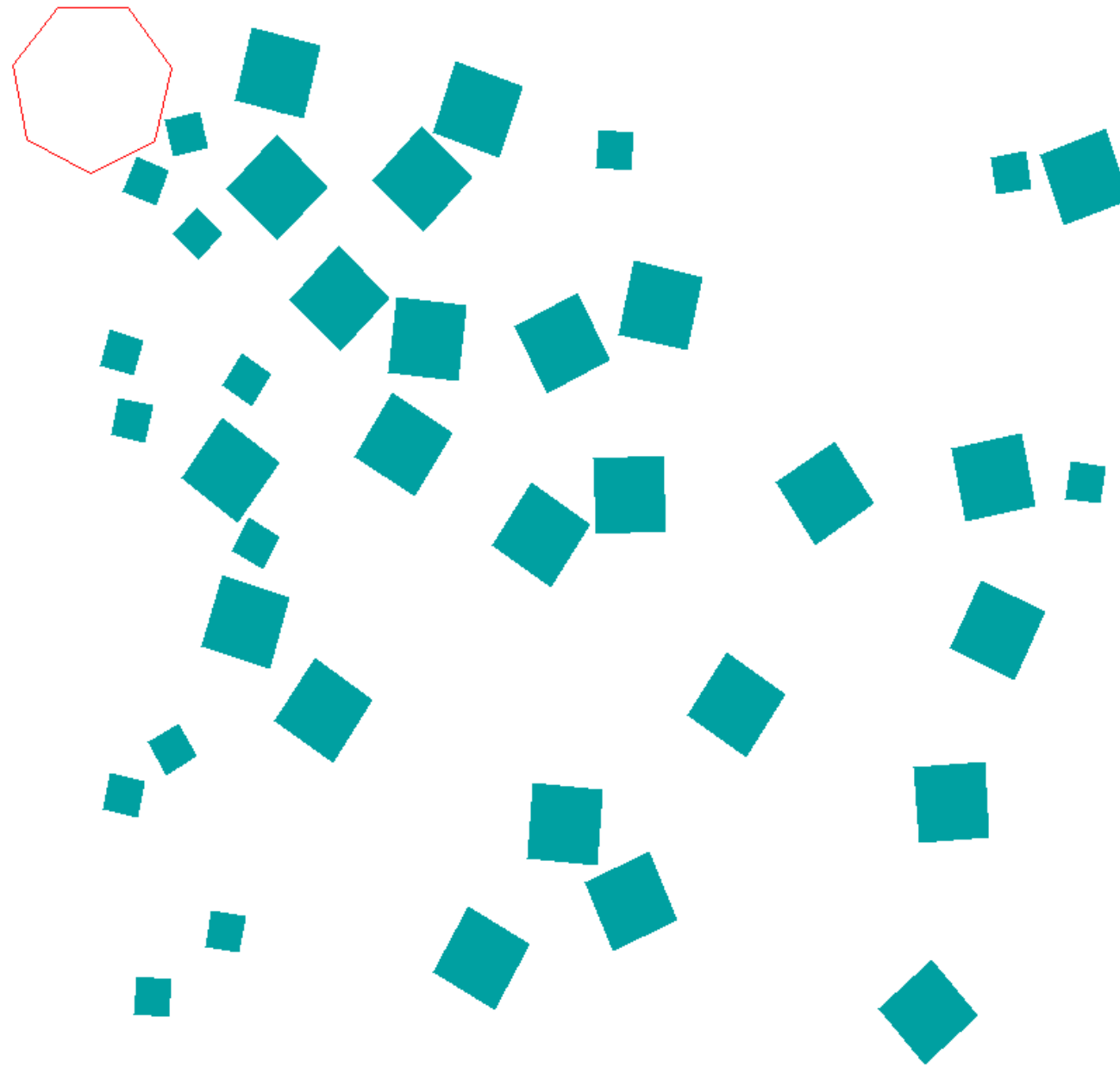
The Problems

- **Problems 1-3:** Hand-crafted small instances (can be solved by hand)
- **Problems 4-7:** Simple convex room, square furniture;
- **Problems 9-12:** Moderately complex, square and arbitrary furniture;
- **Problems 13-16:** Highly complex, square and arbitrary furniture;
- **Problems 17-23:** Complex, rectilinear, square and arbitrary furniture;
- **Problems 24-28:** Quasi-irregular, large rooms, square furniture;
- **Problems 29-30:** Fun problems, square furniture.

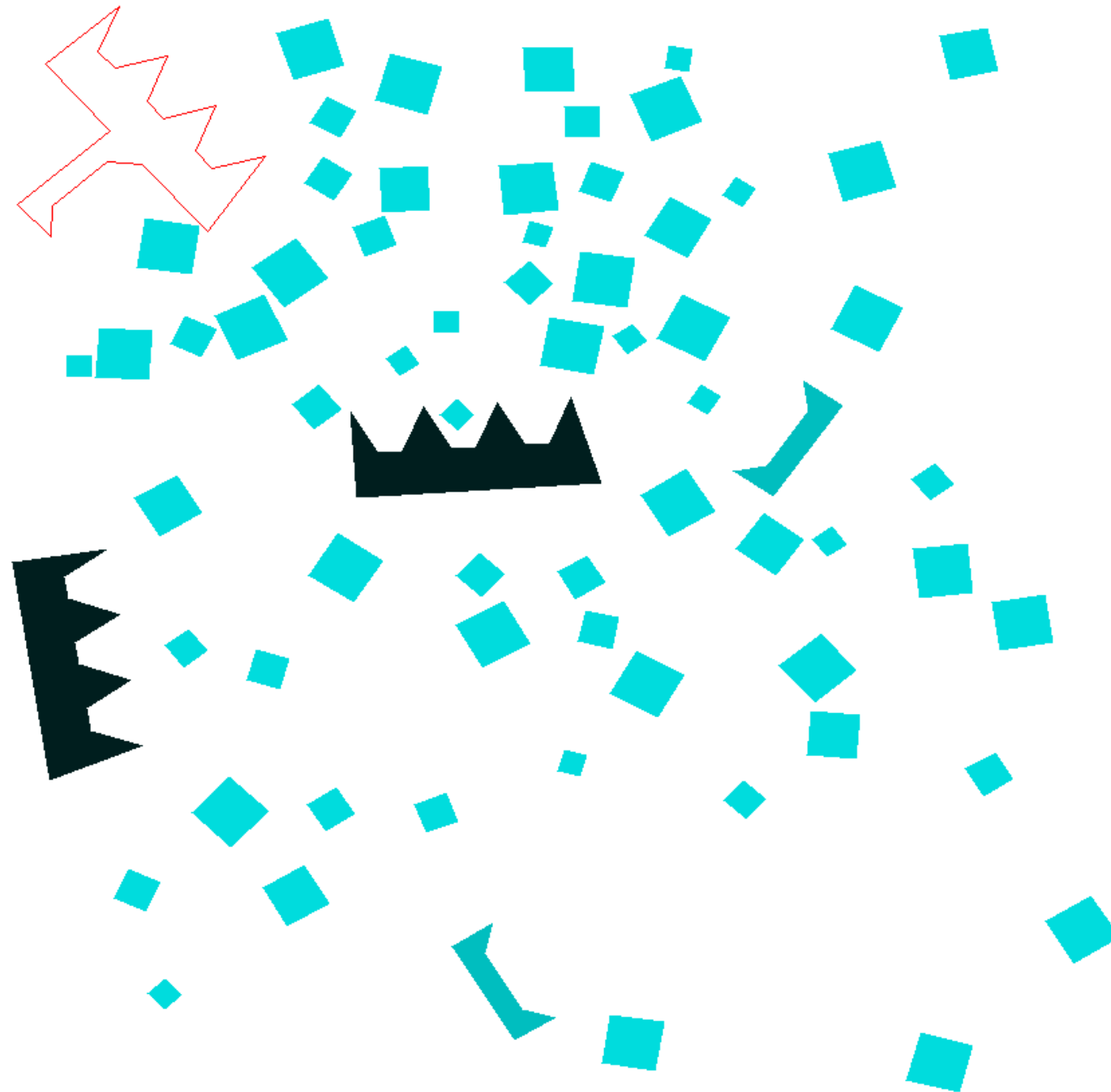
Problem 1



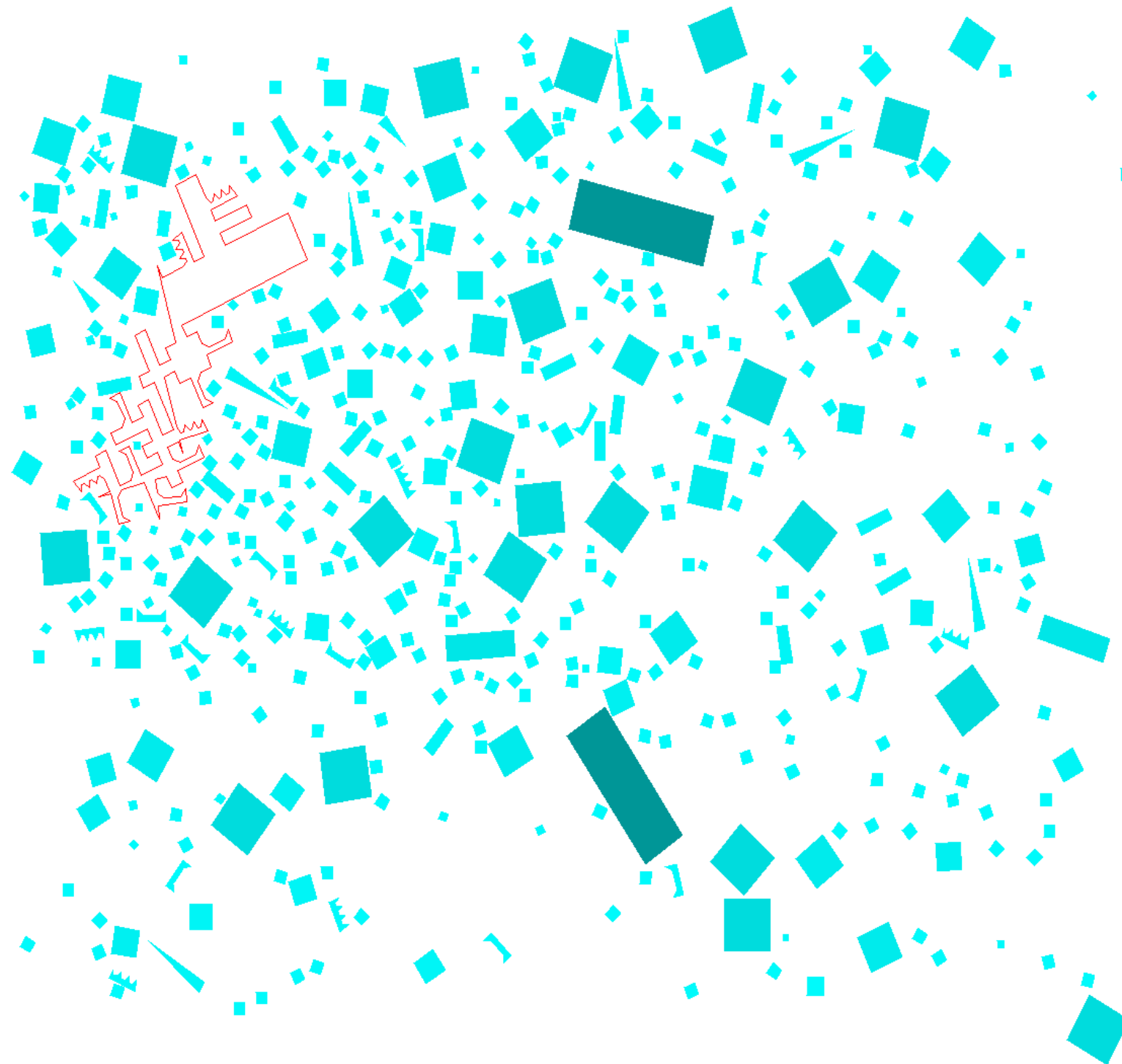
Problem 5



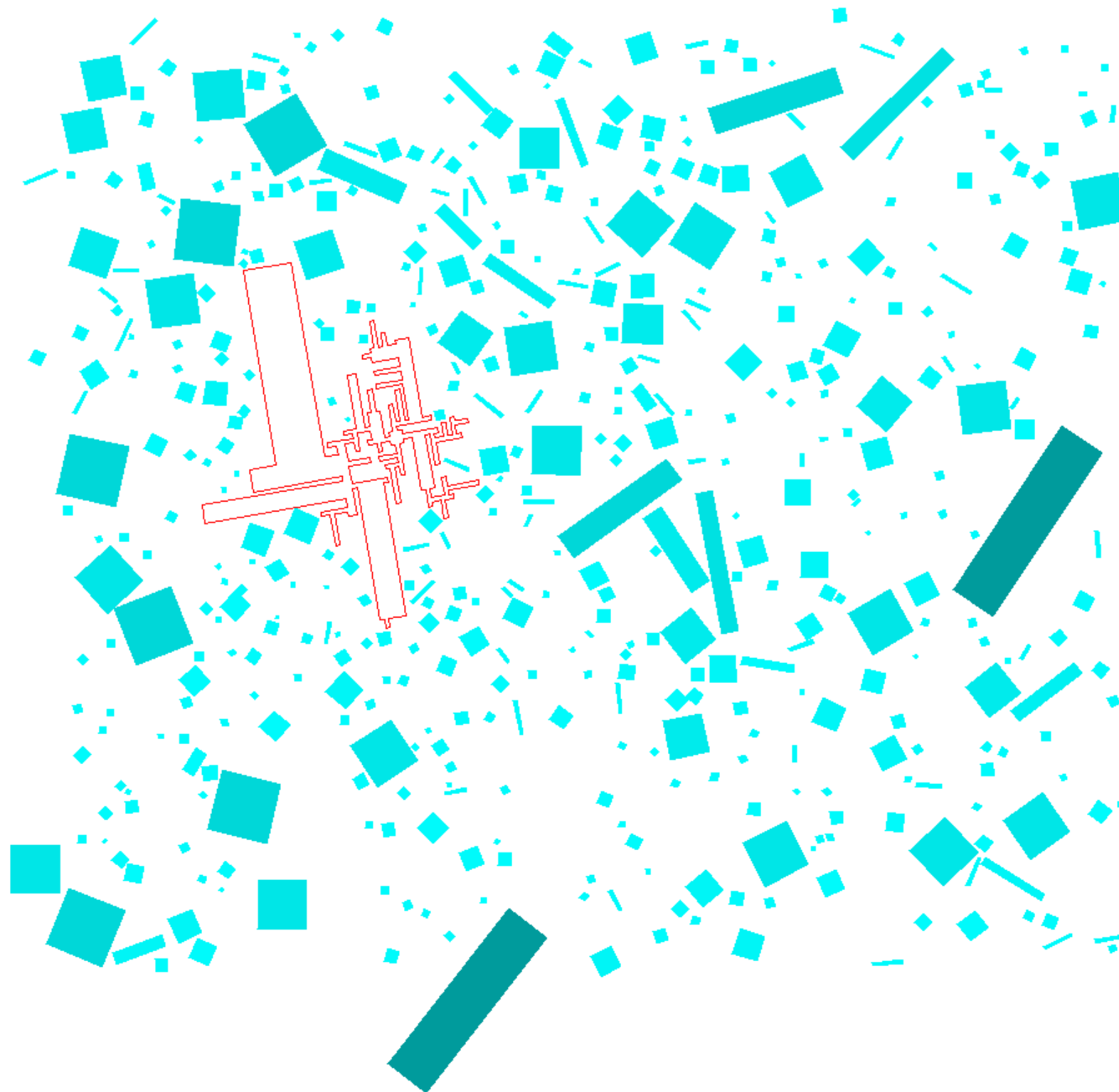
Problem 12



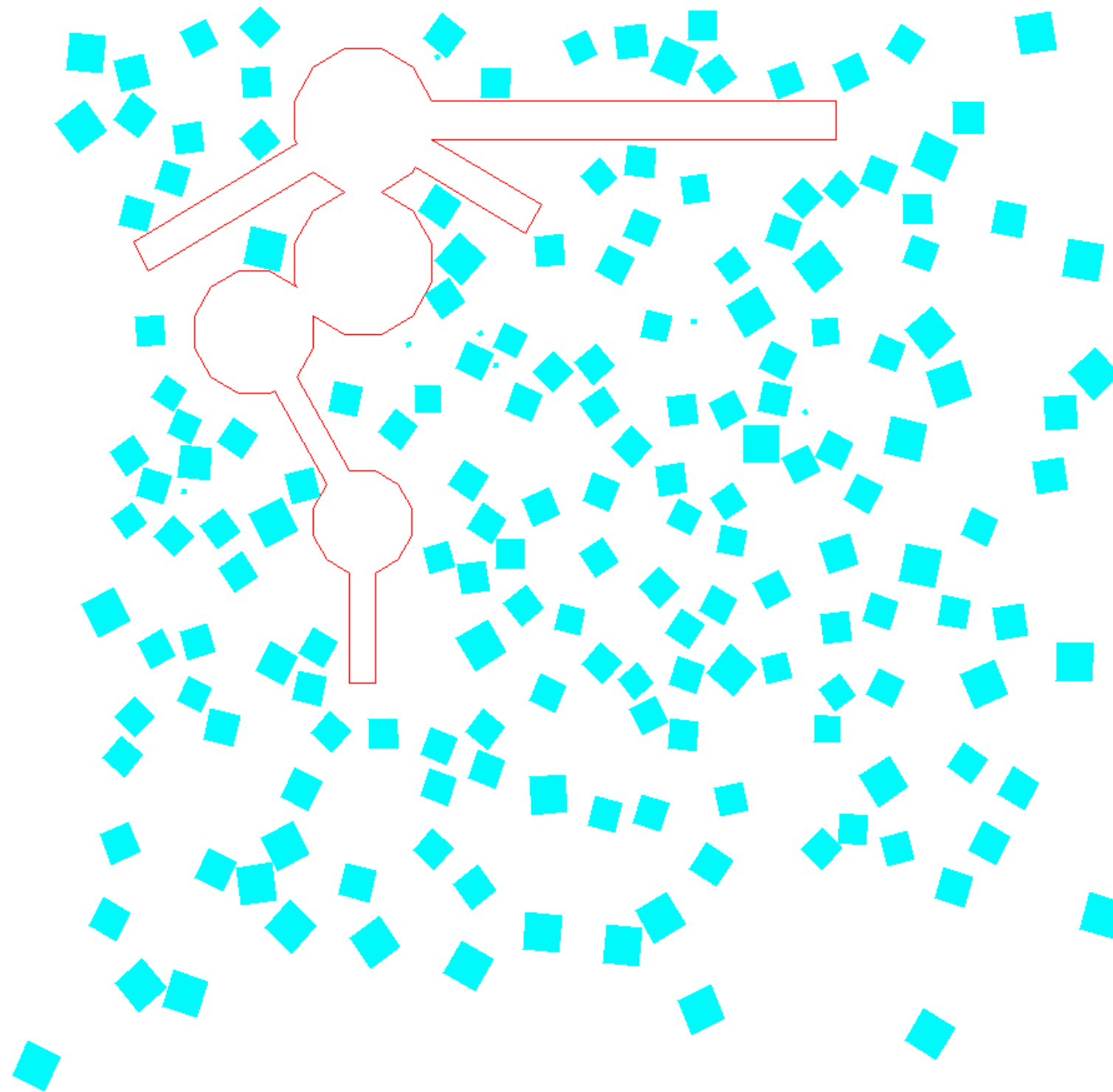
Problem 16



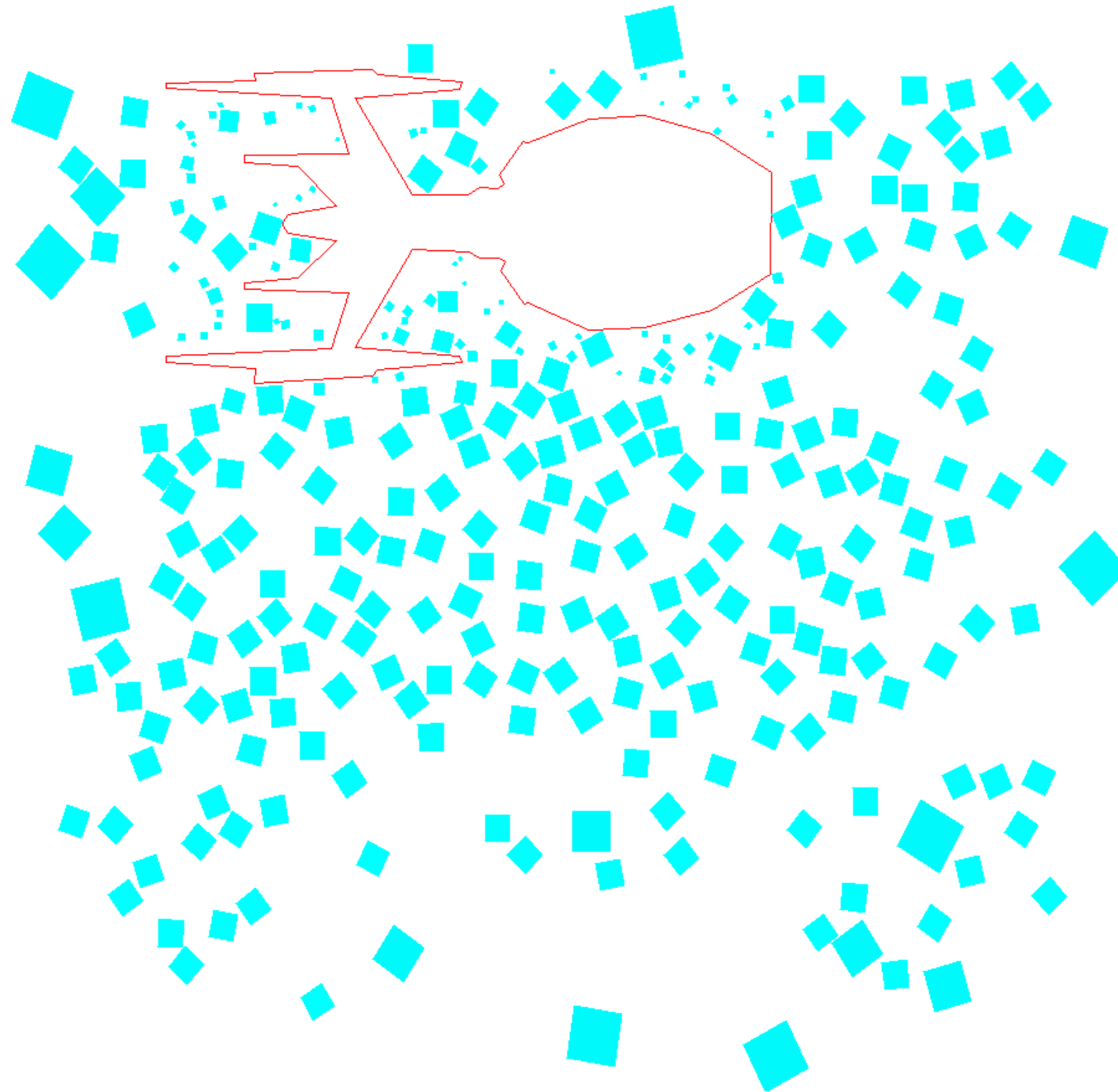
Problem 19



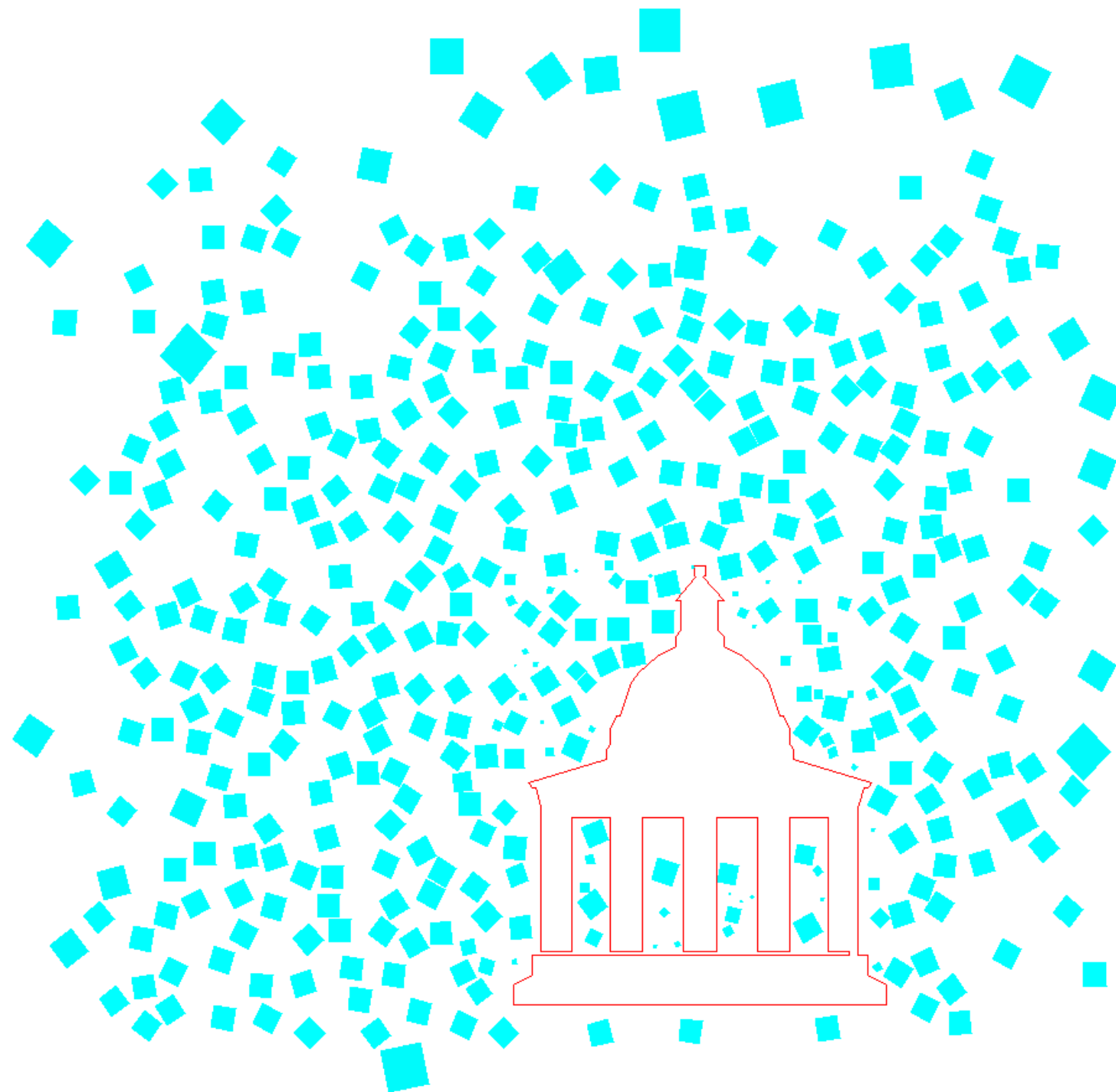
Problem 26



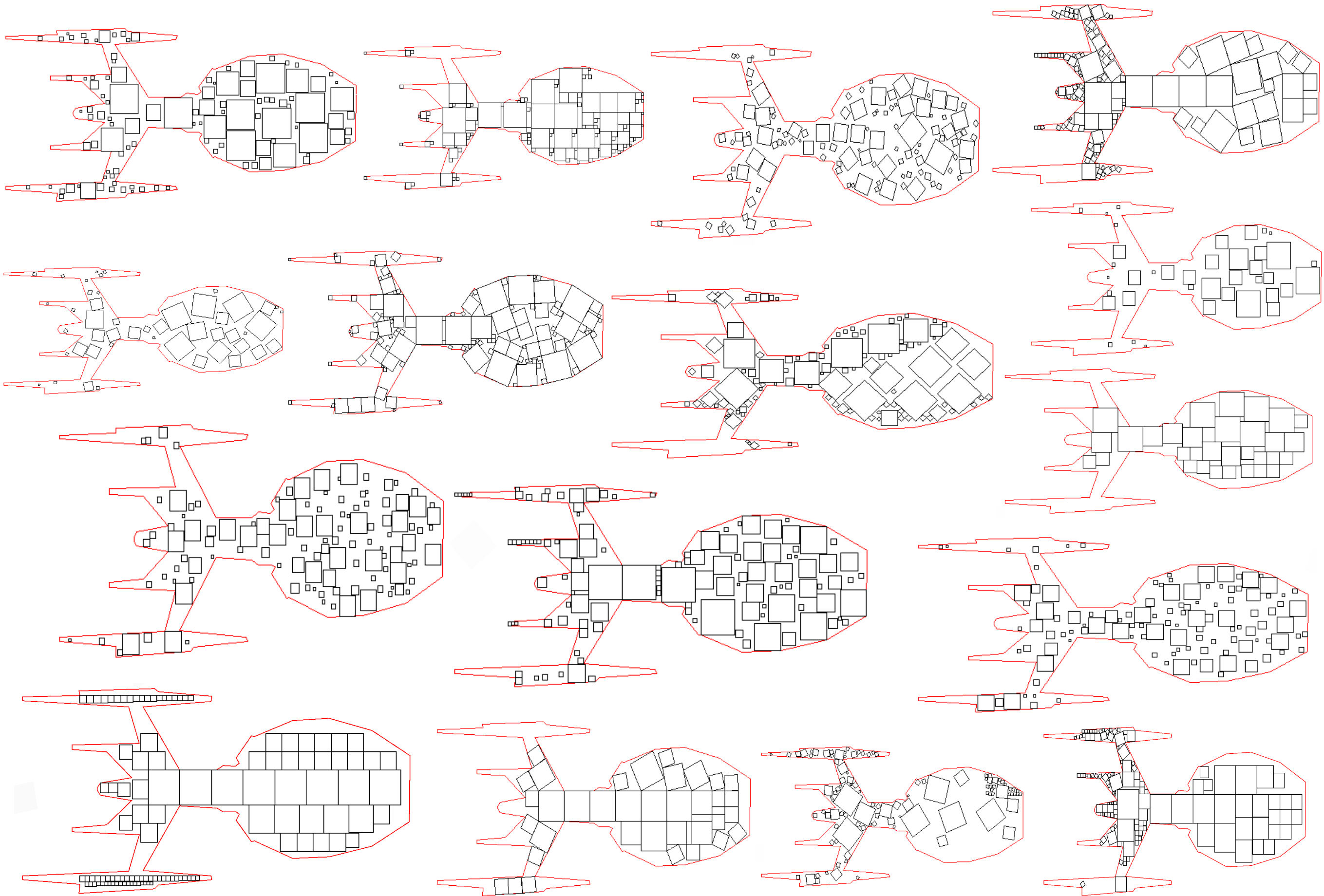
Problem 29



Problem 30



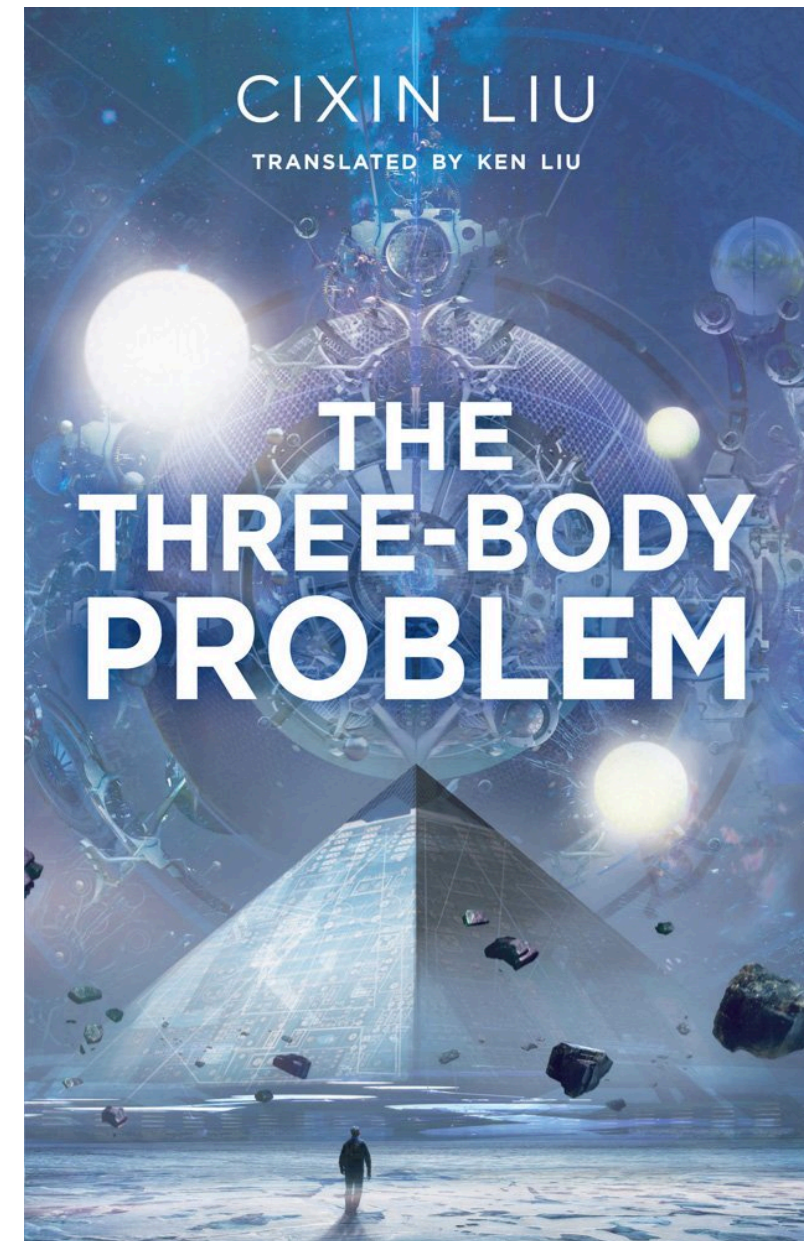
The Solutions





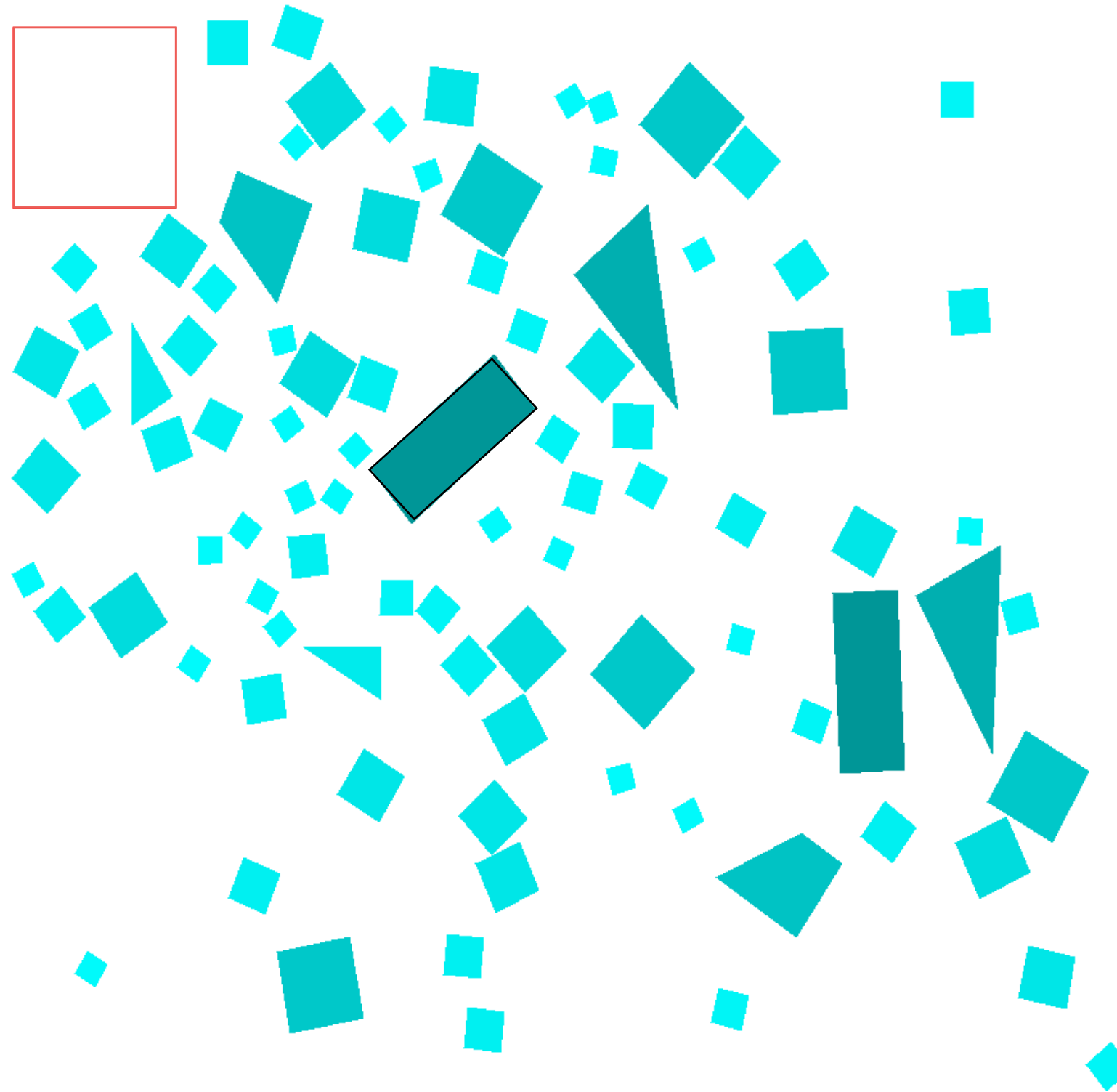
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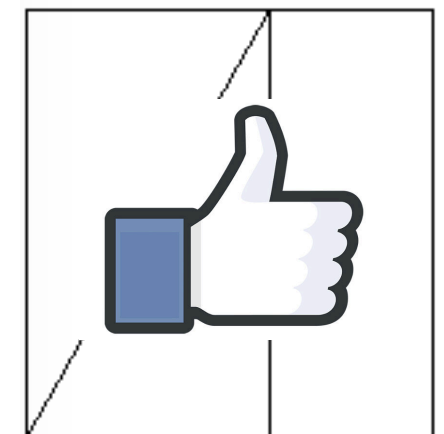
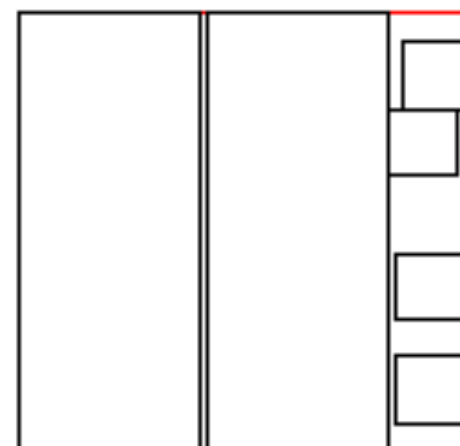
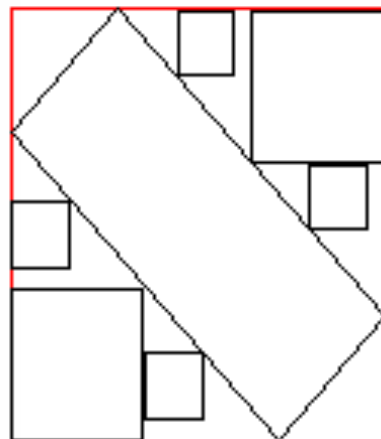
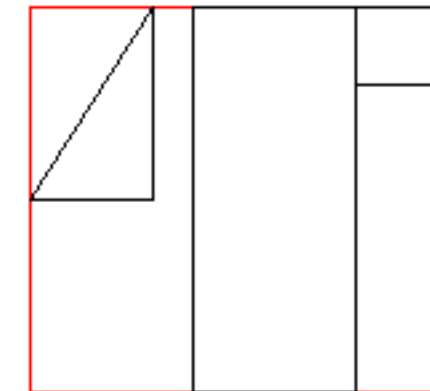
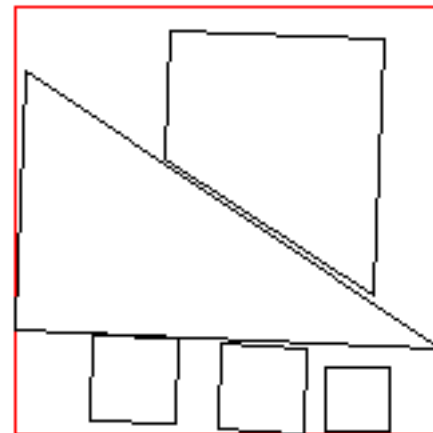
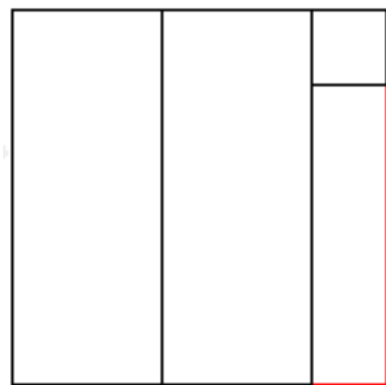
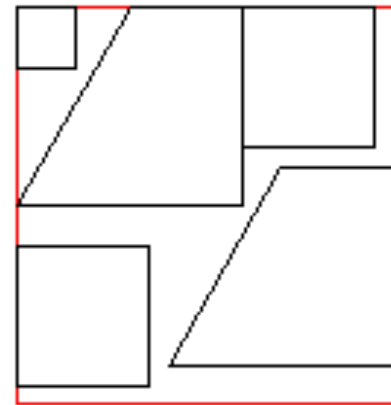
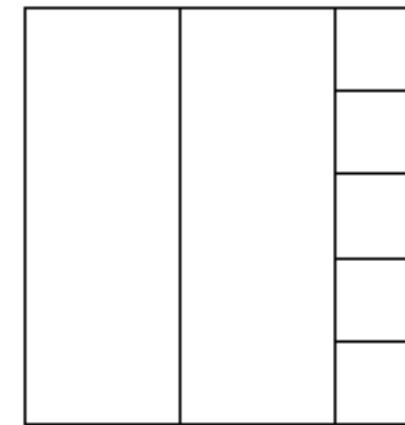
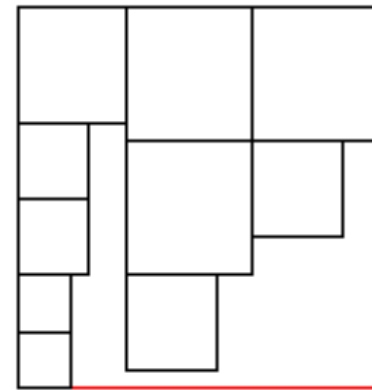
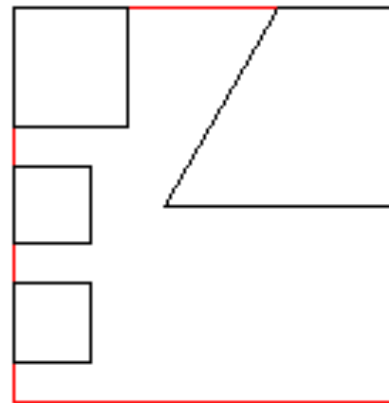
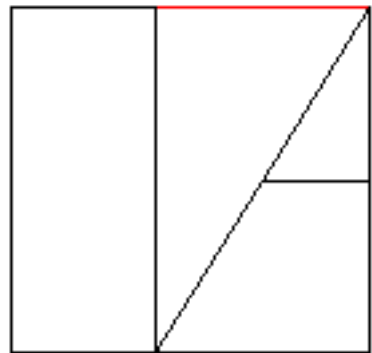
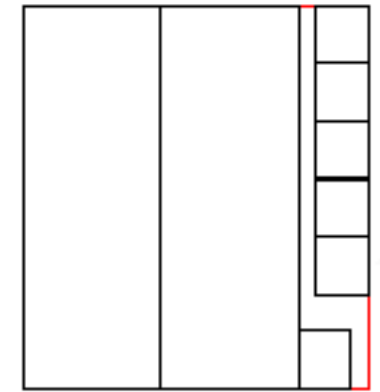
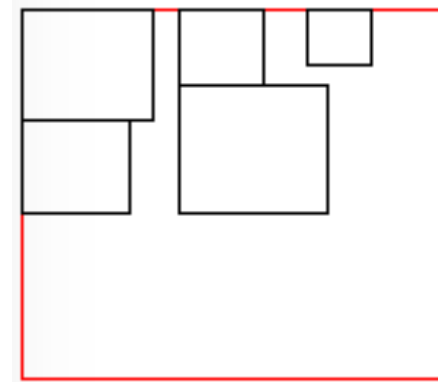
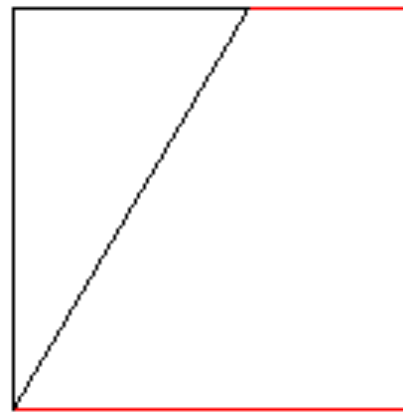
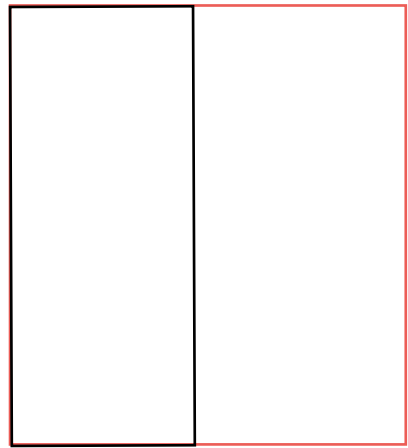
- Singularity Era
- Chaotic Era
- Stable Era

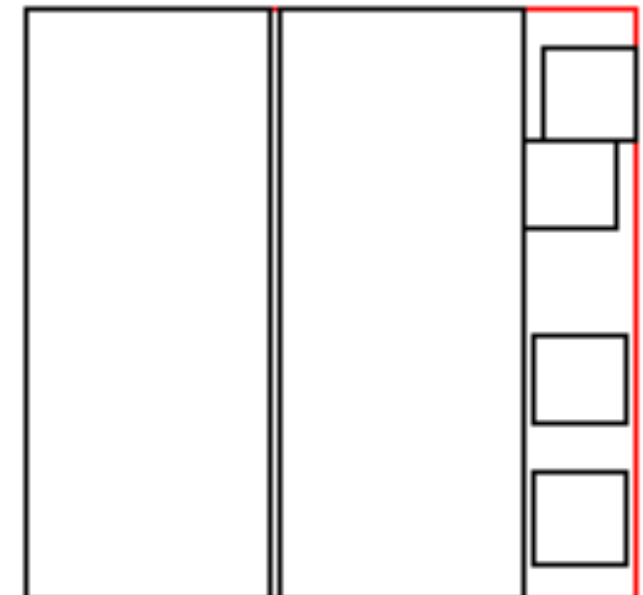
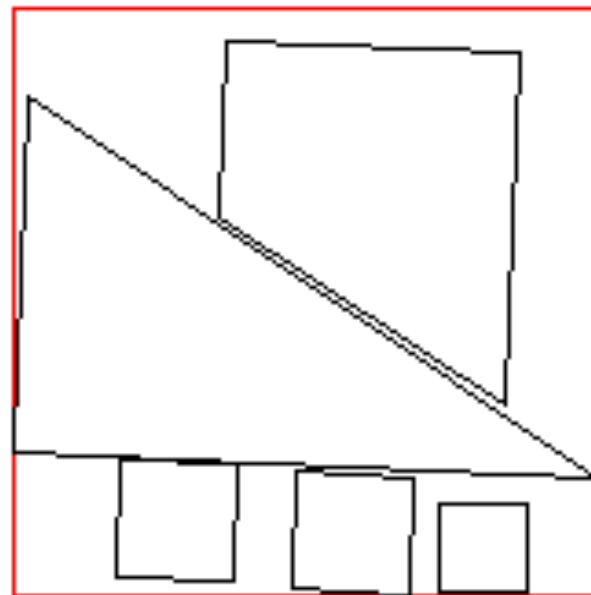
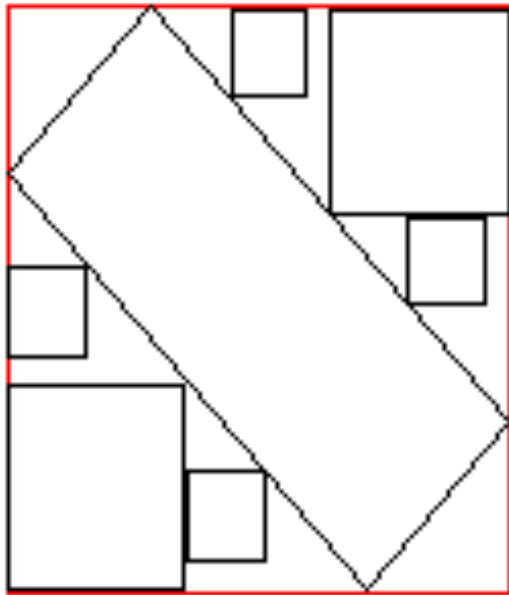


Singularity Era

Monday, 11 Dec, 16:00,
team [salamanca](#)

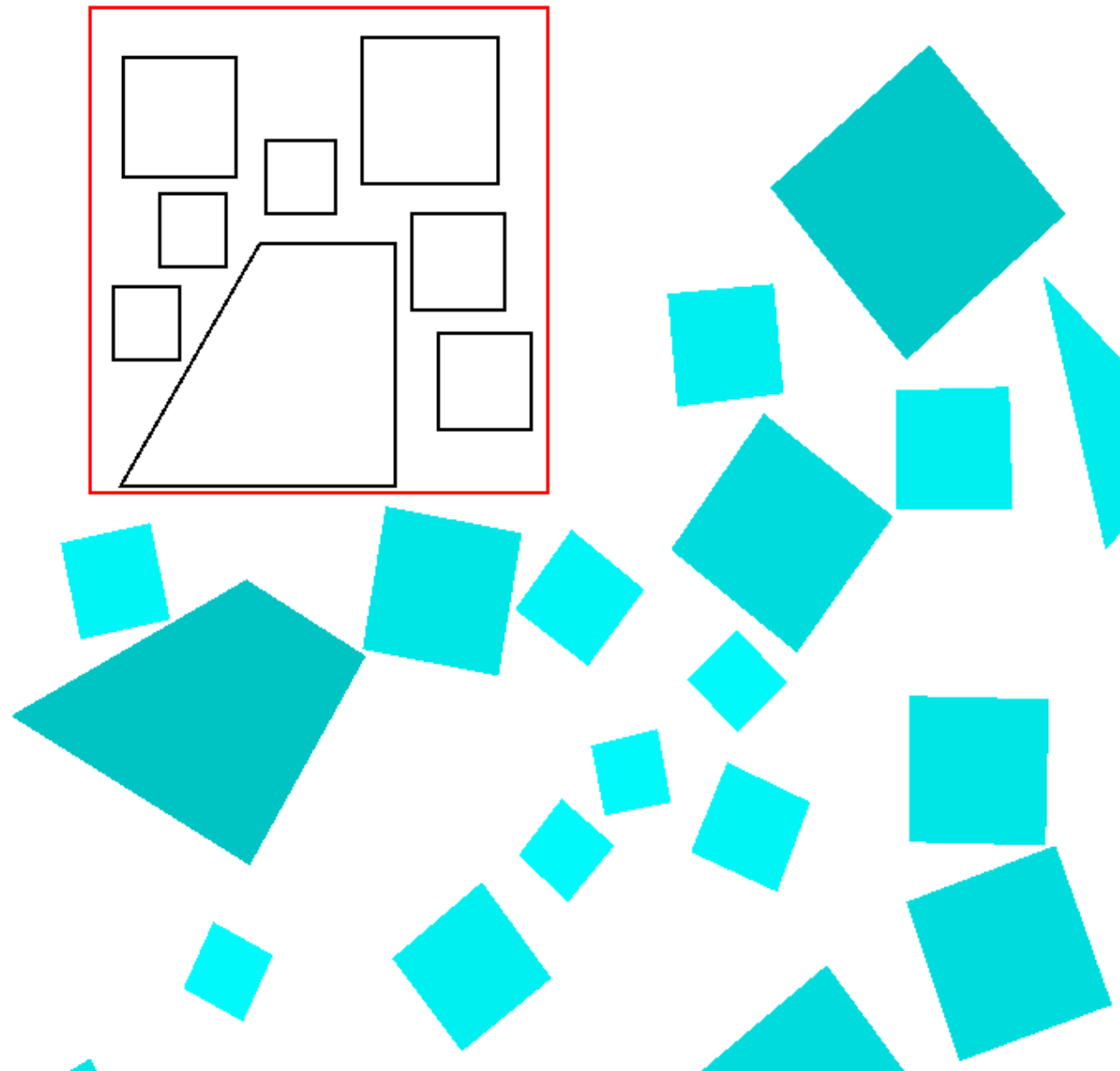


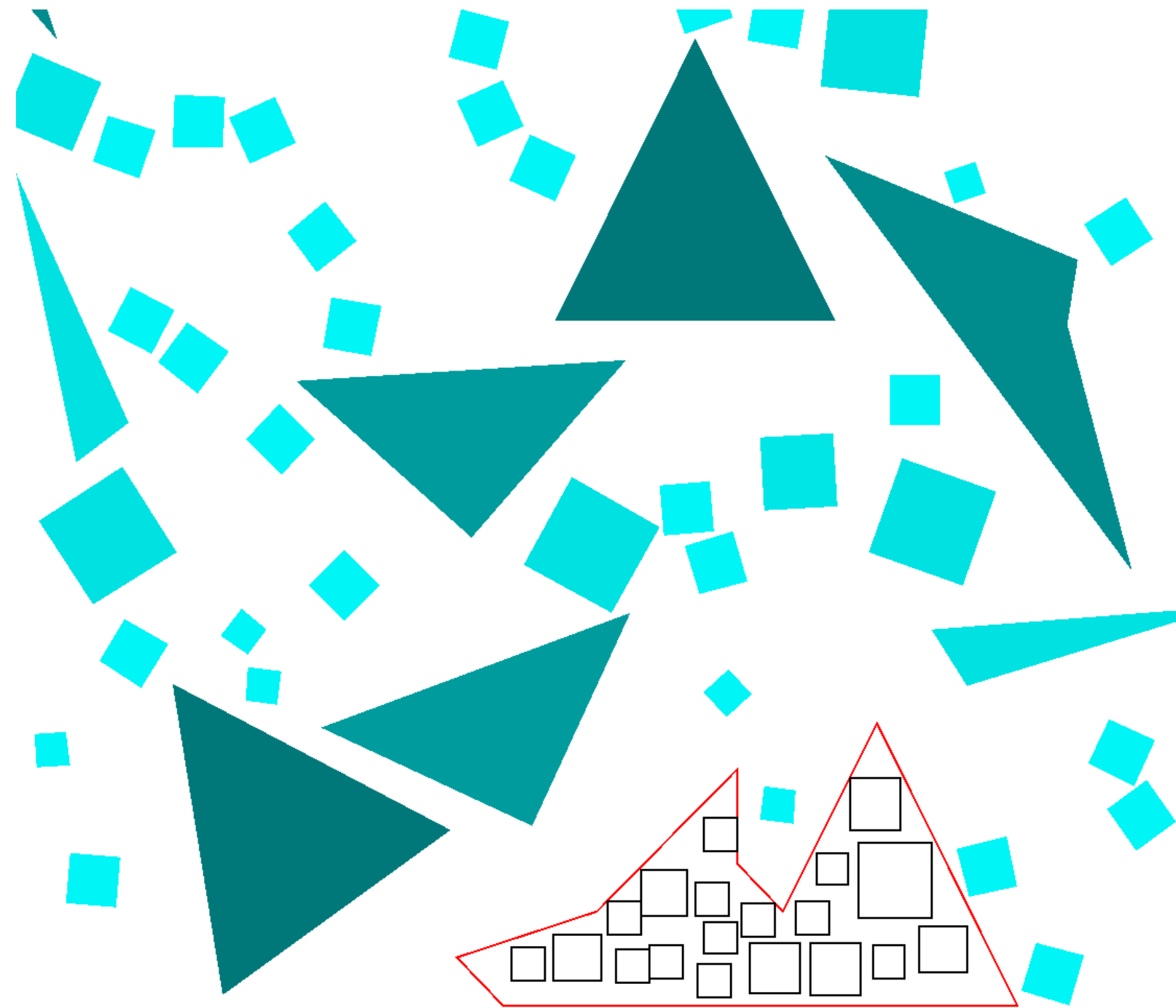


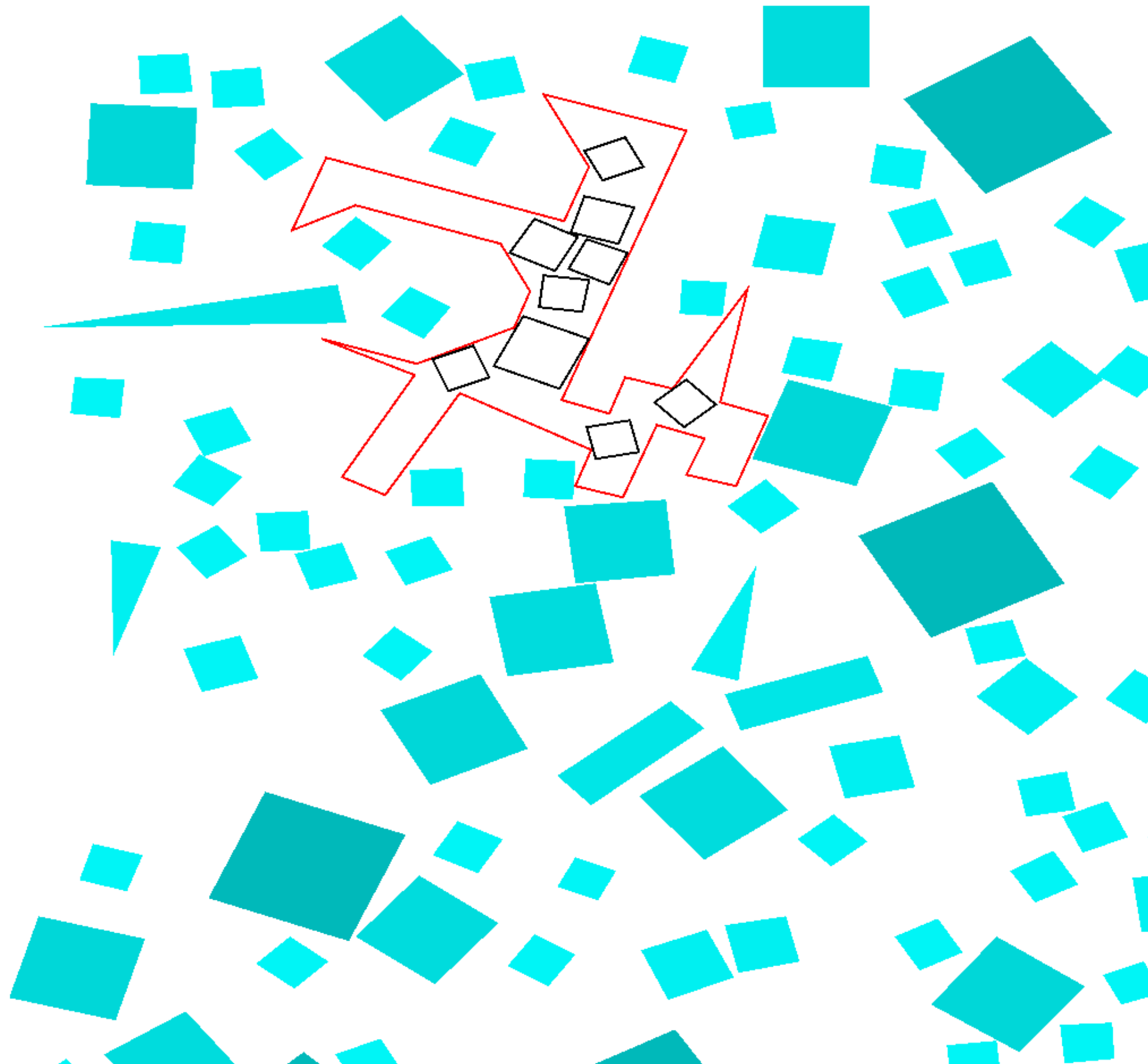


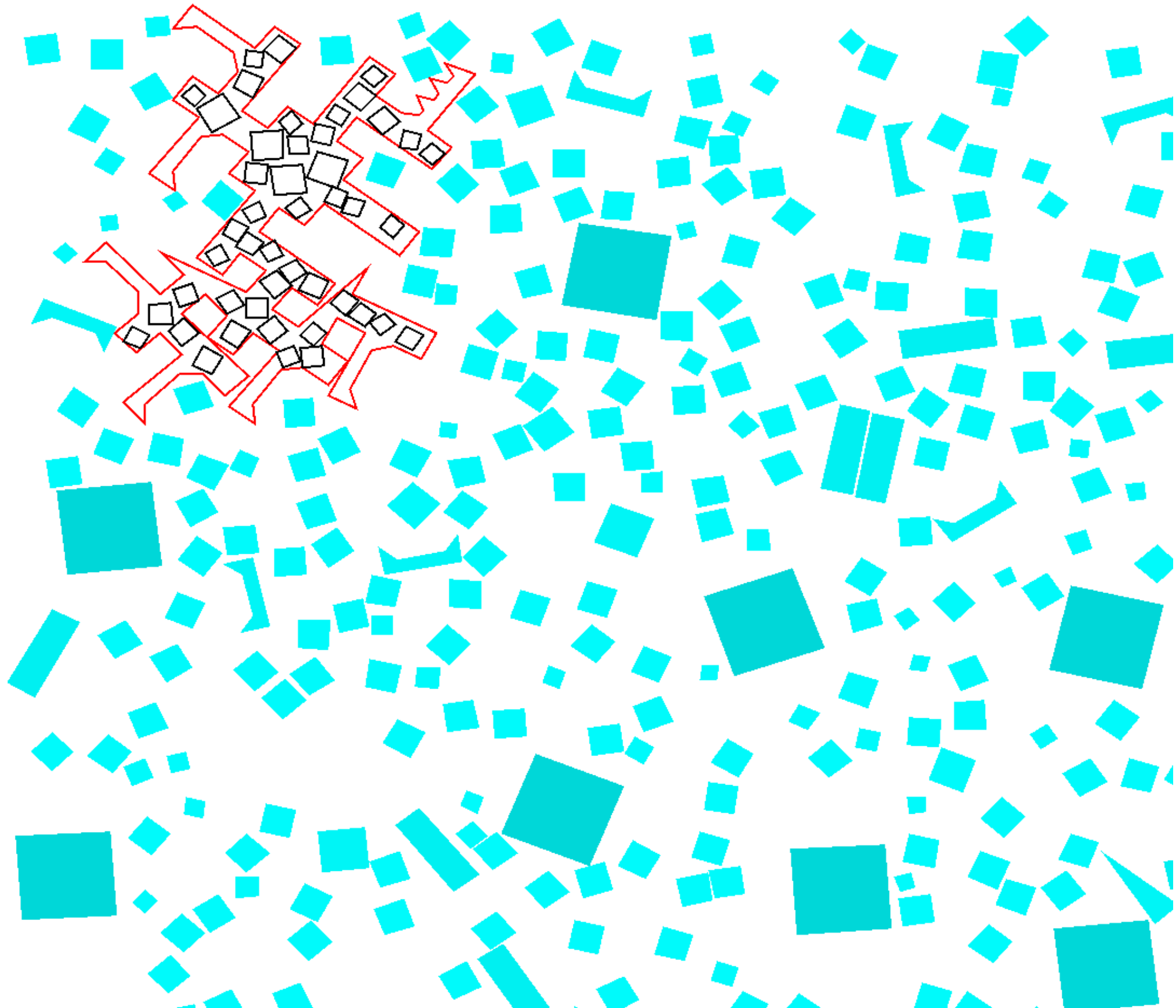
Chaotic Era

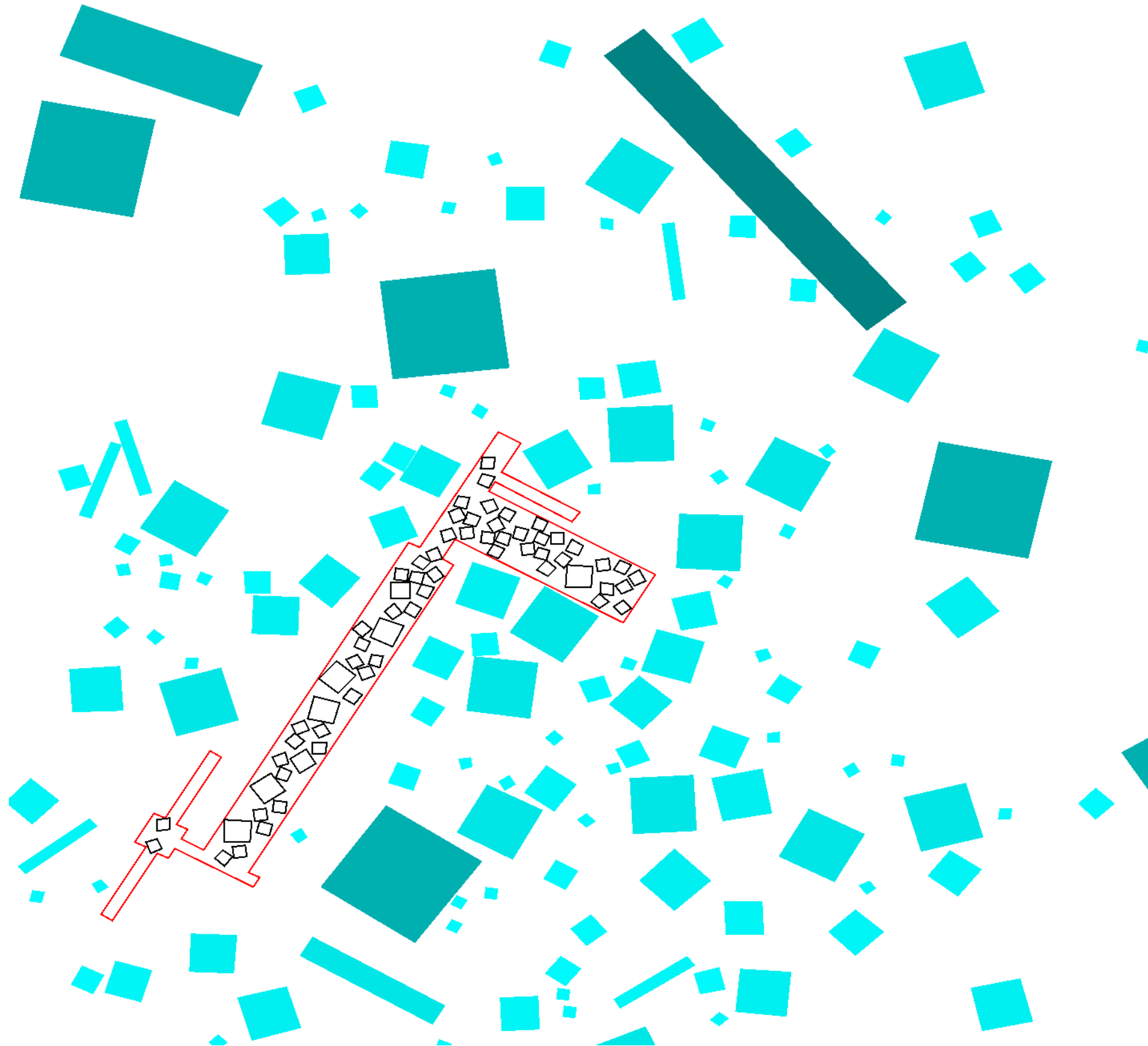
Monday, 11 Dec, ~23:00,
team [segovia](#)

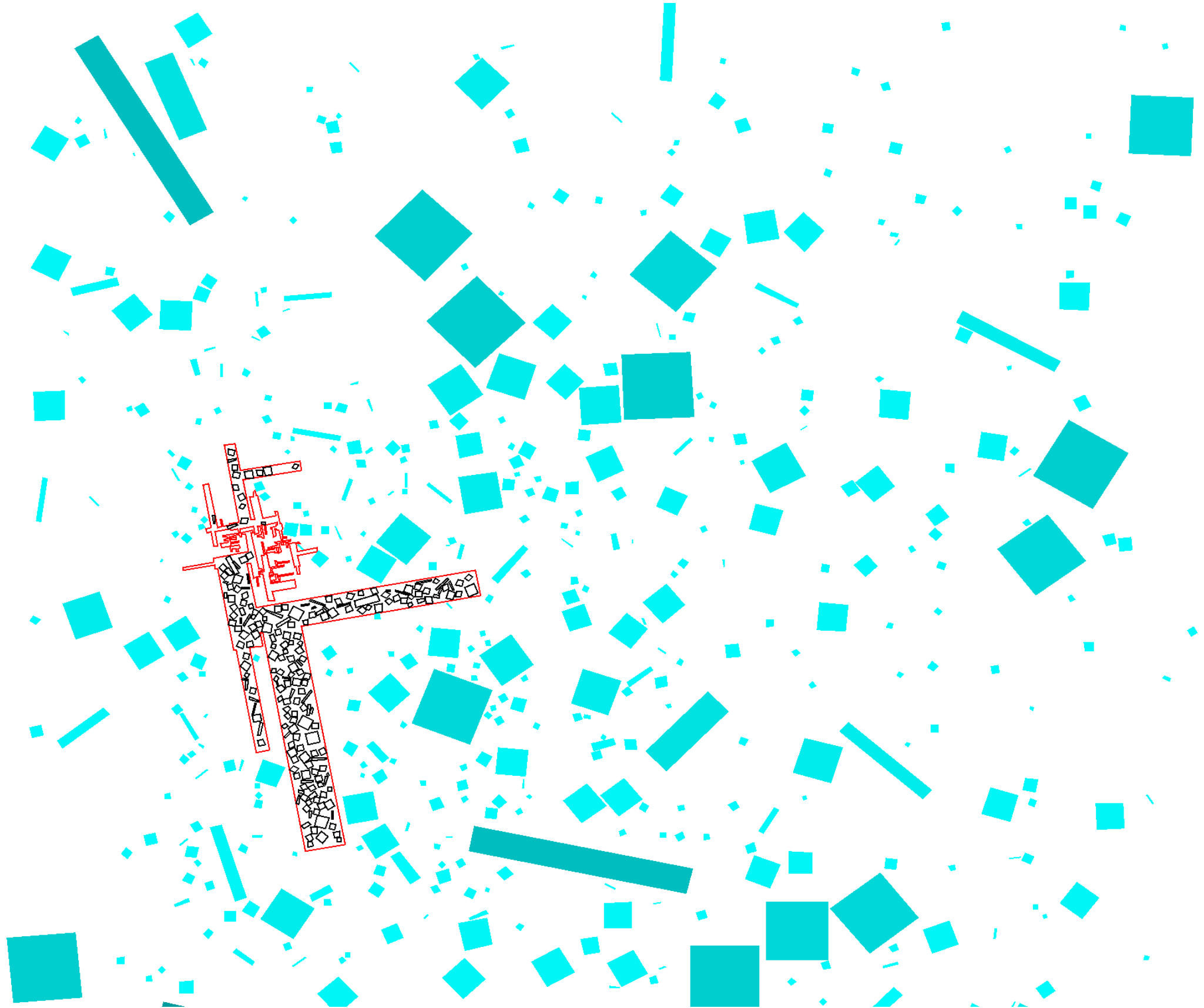


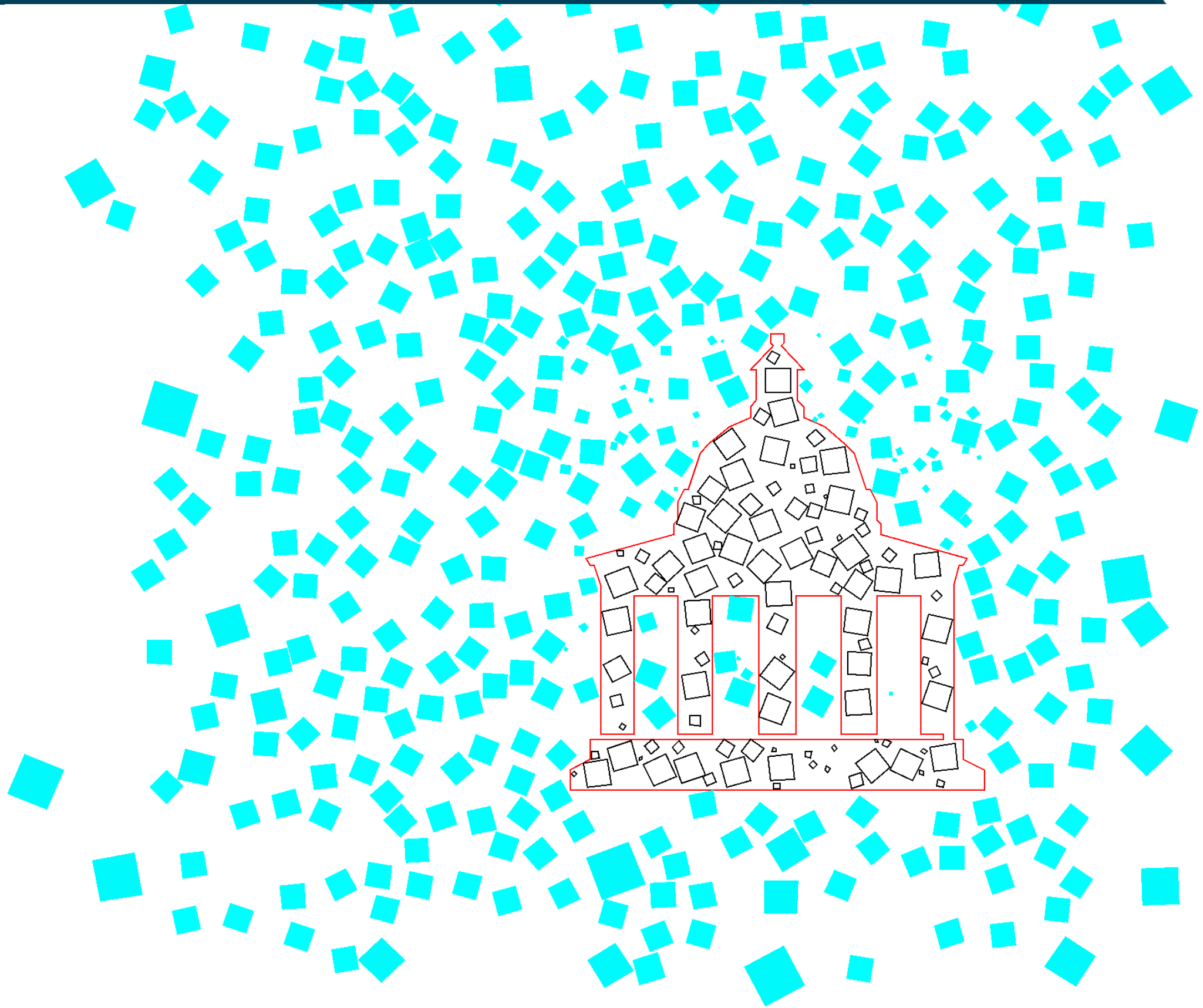






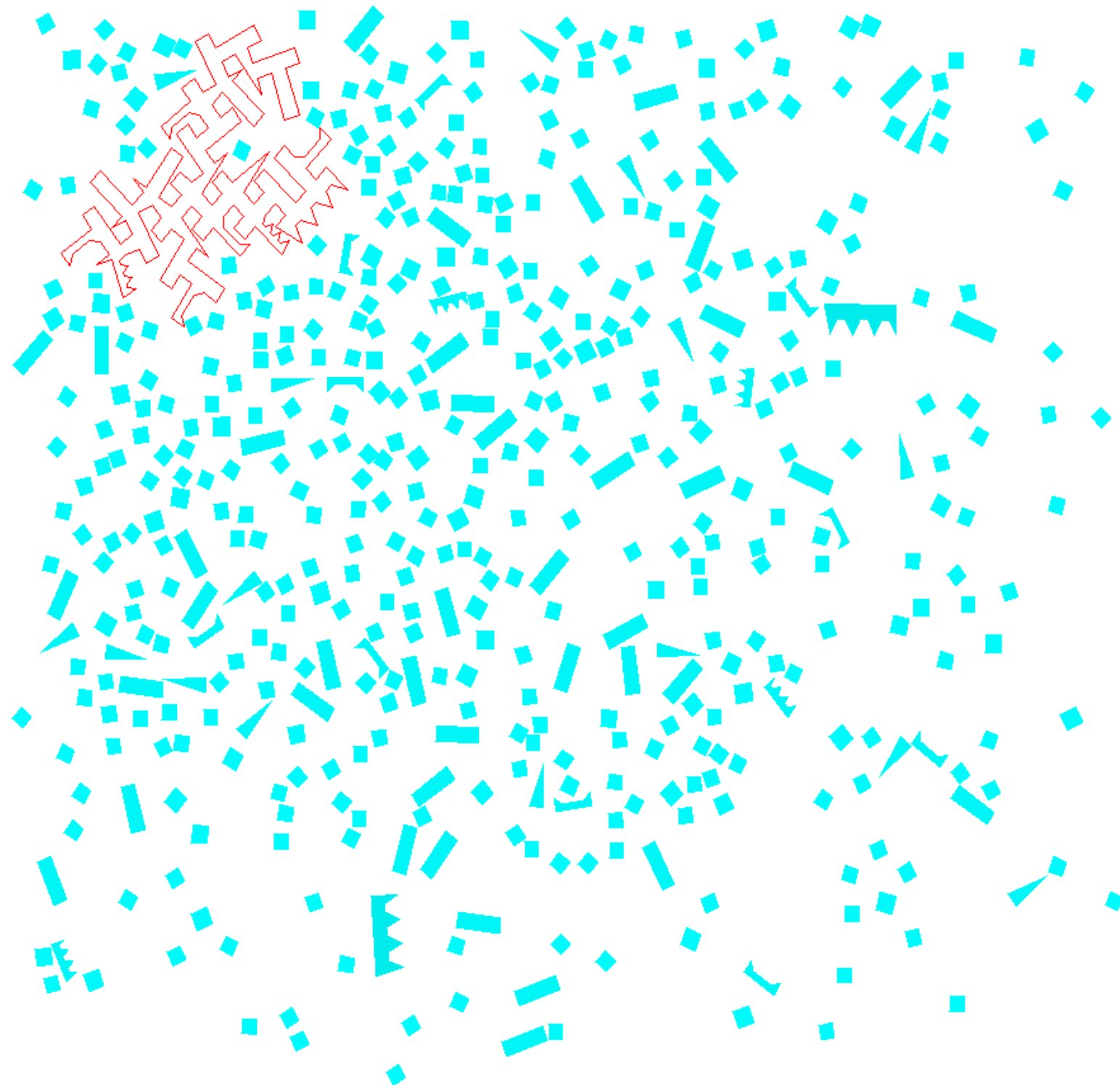








Problem 11





The proposed solution is valid but covers only 24% of the room.

Intermezzo: Growing polygons

Growing polygons

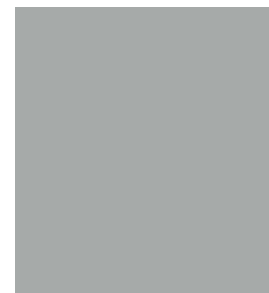
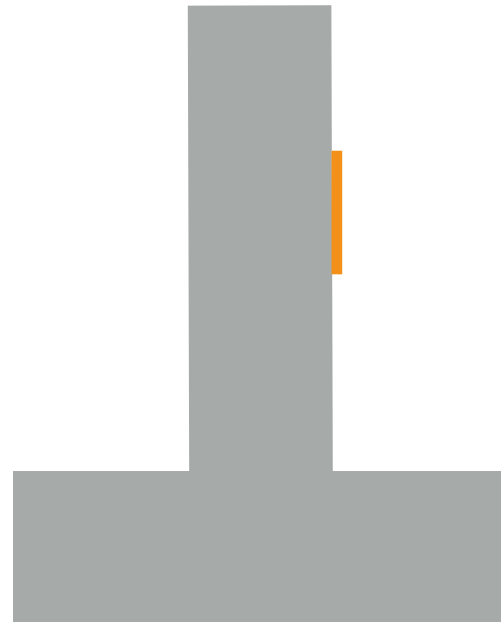


Primitive polygons with specific “features”

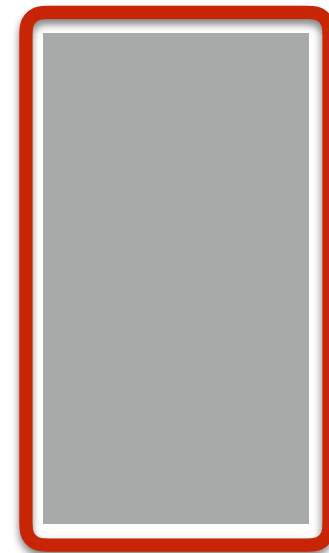
Growing polygons



Growing polygons



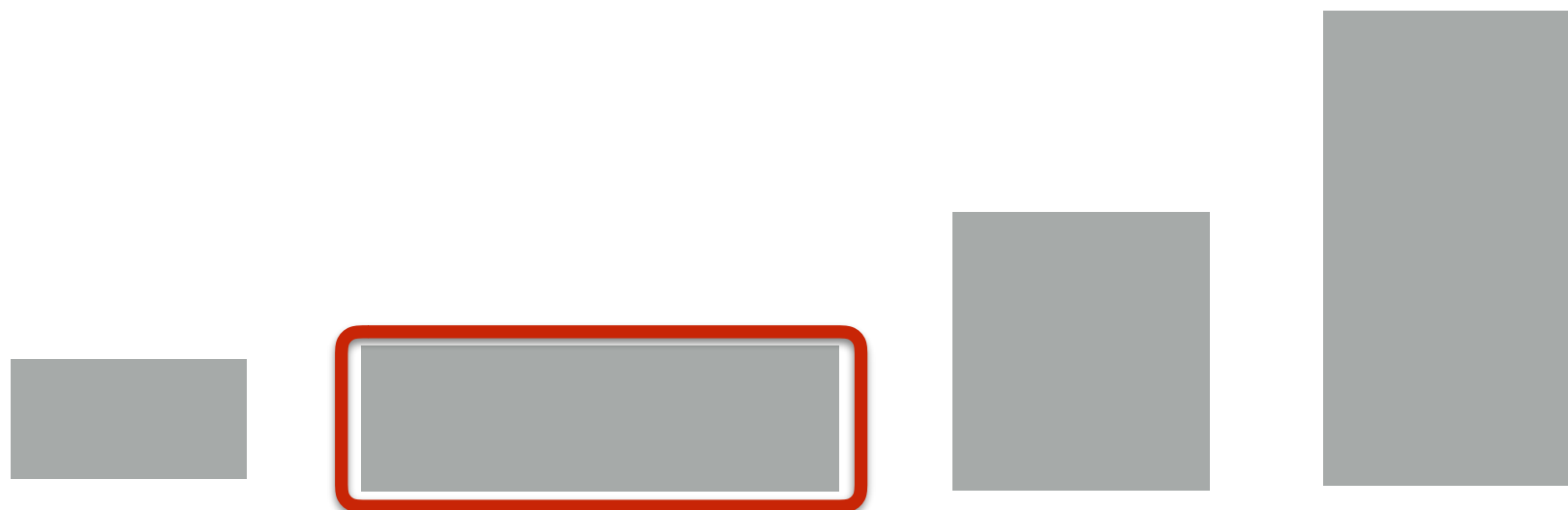
Growing polygons



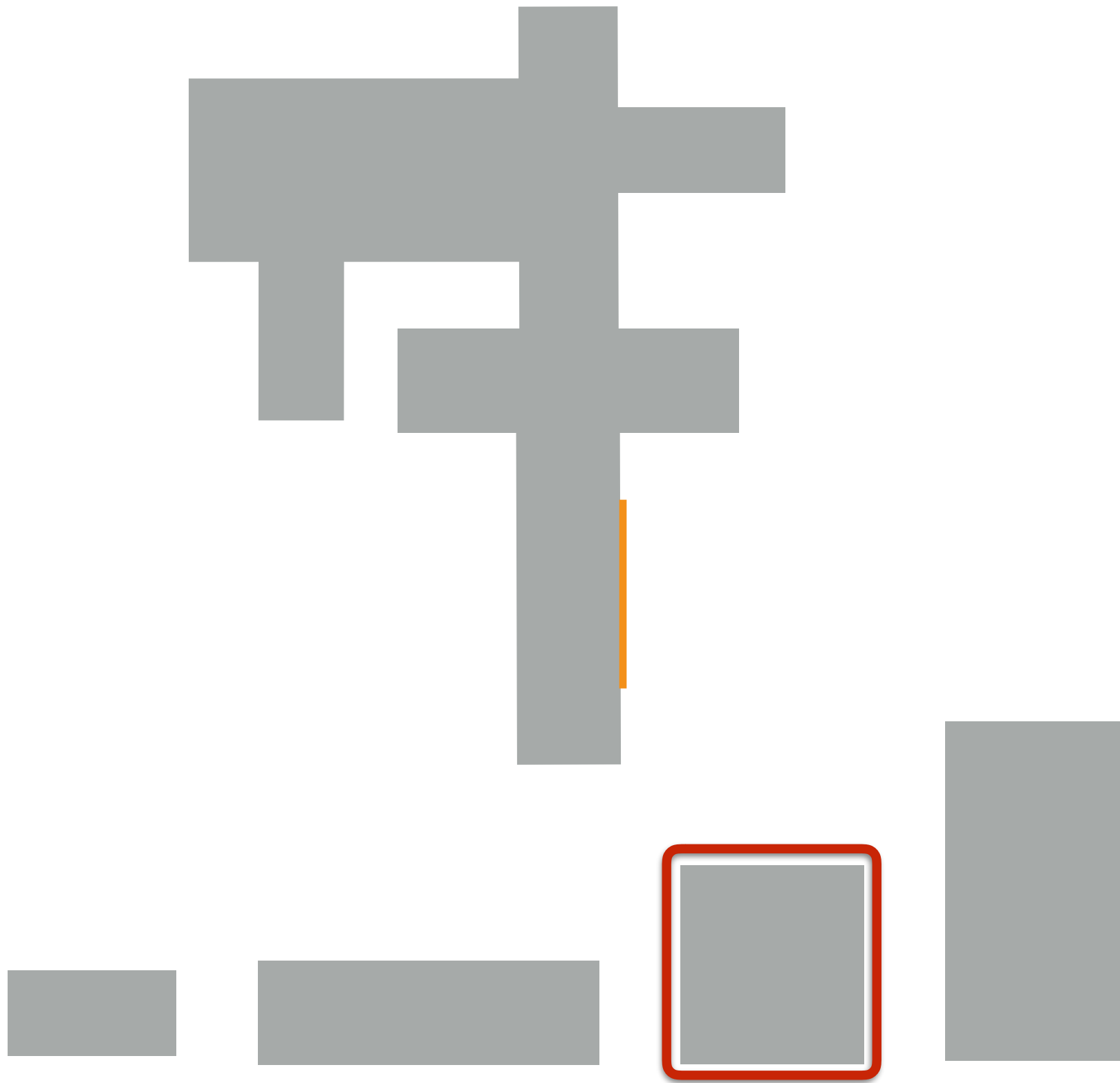
Growing polygons



Growing polygons

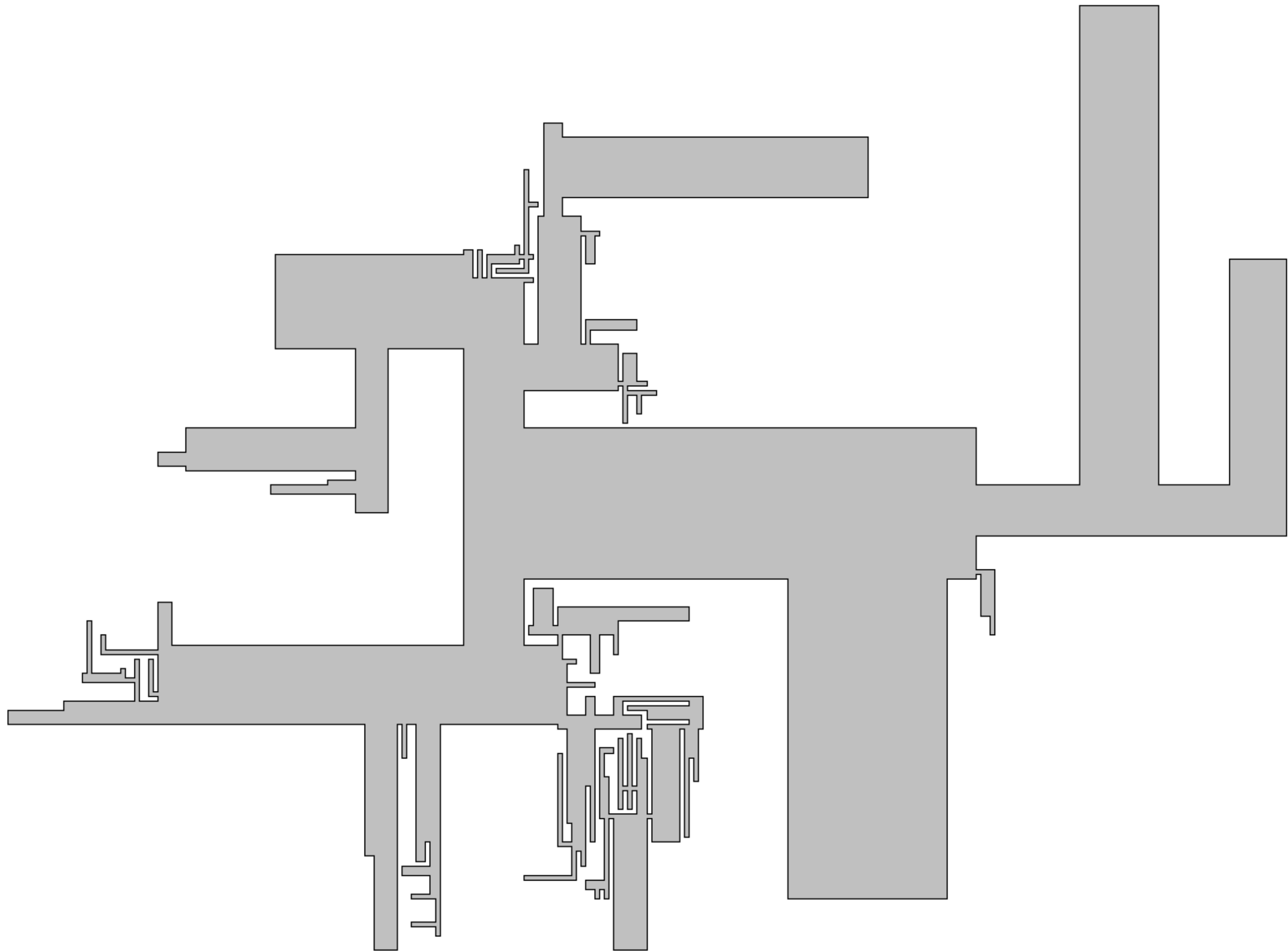


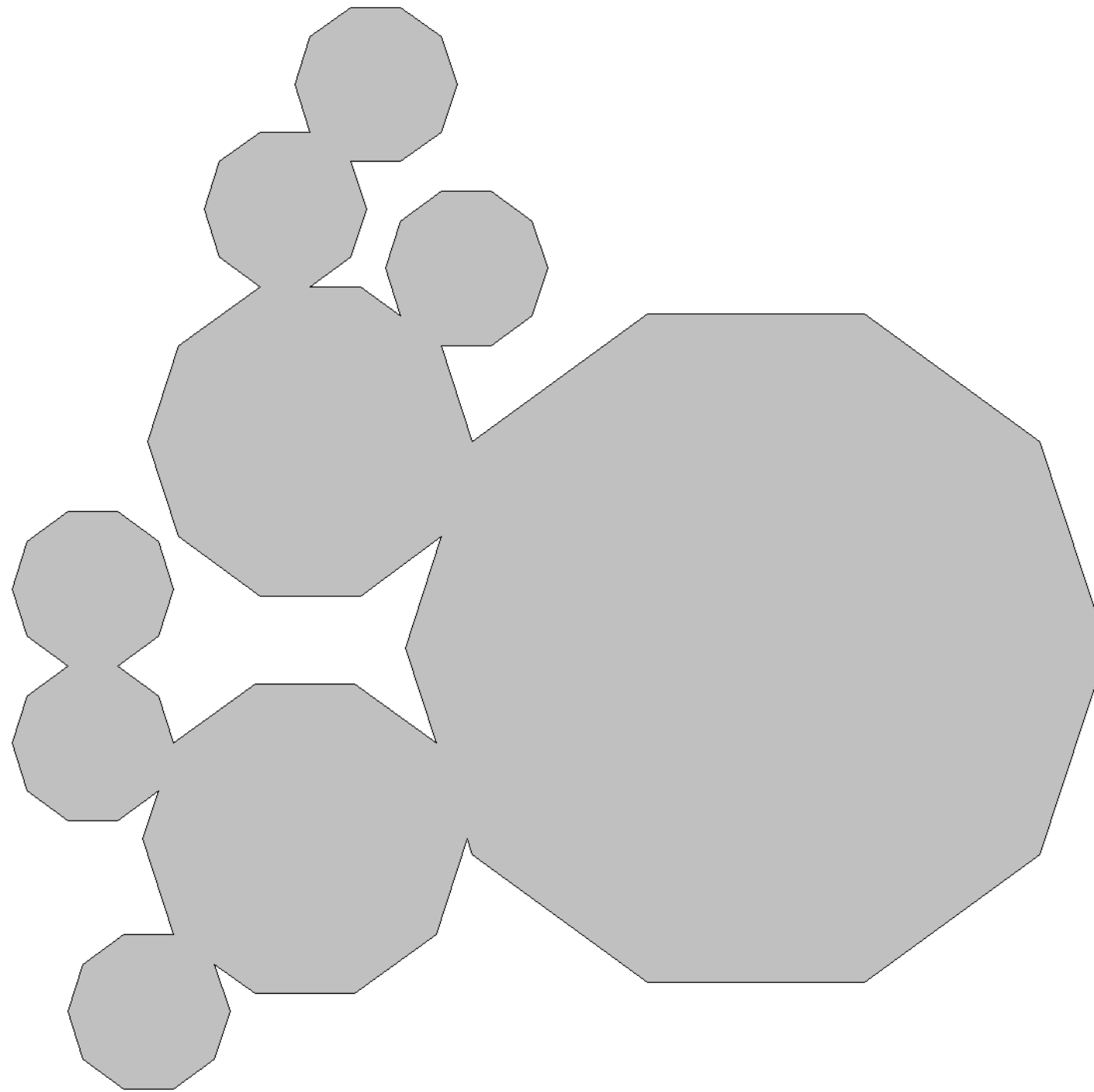
Growing polygons

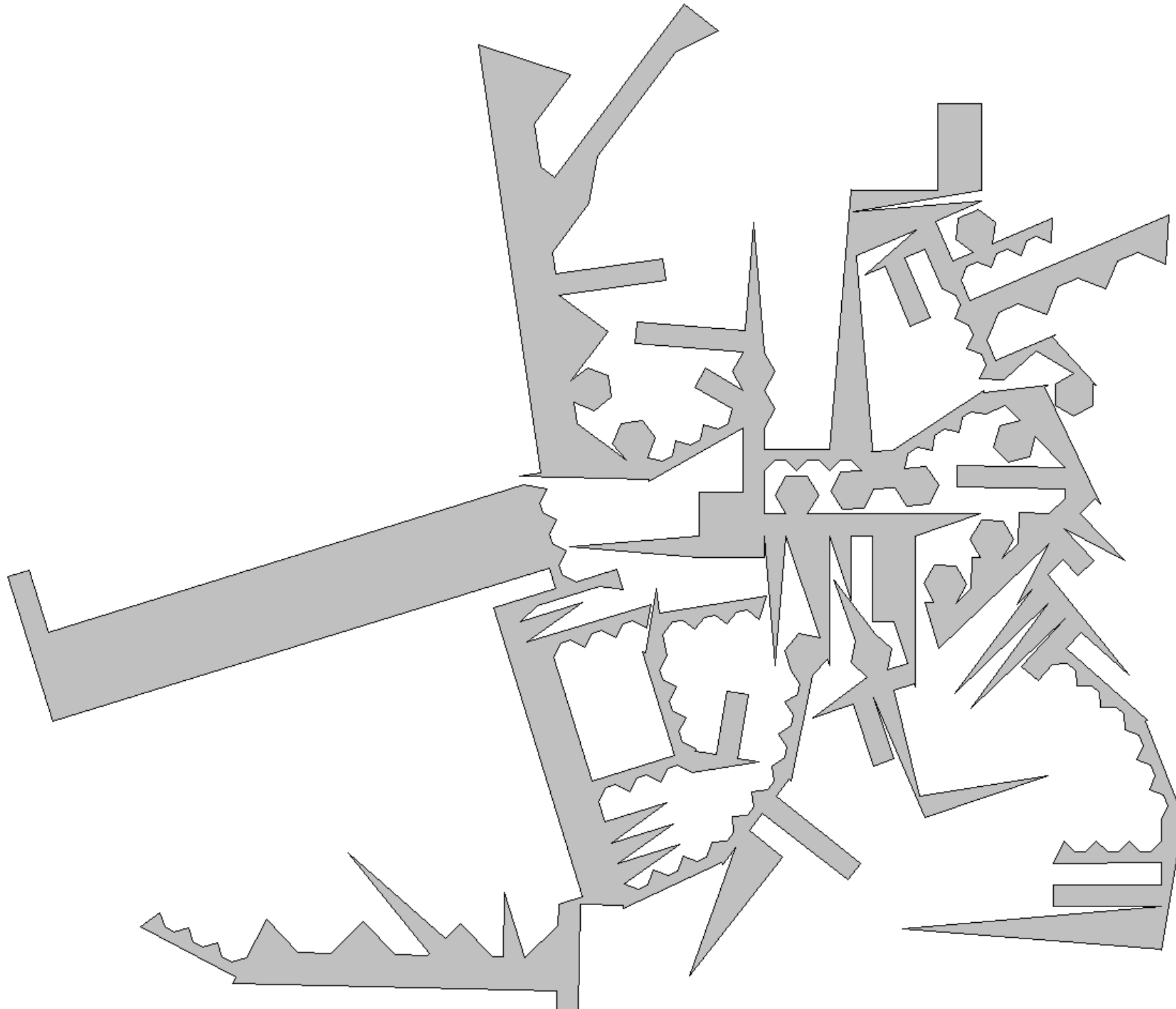


Growing polygons





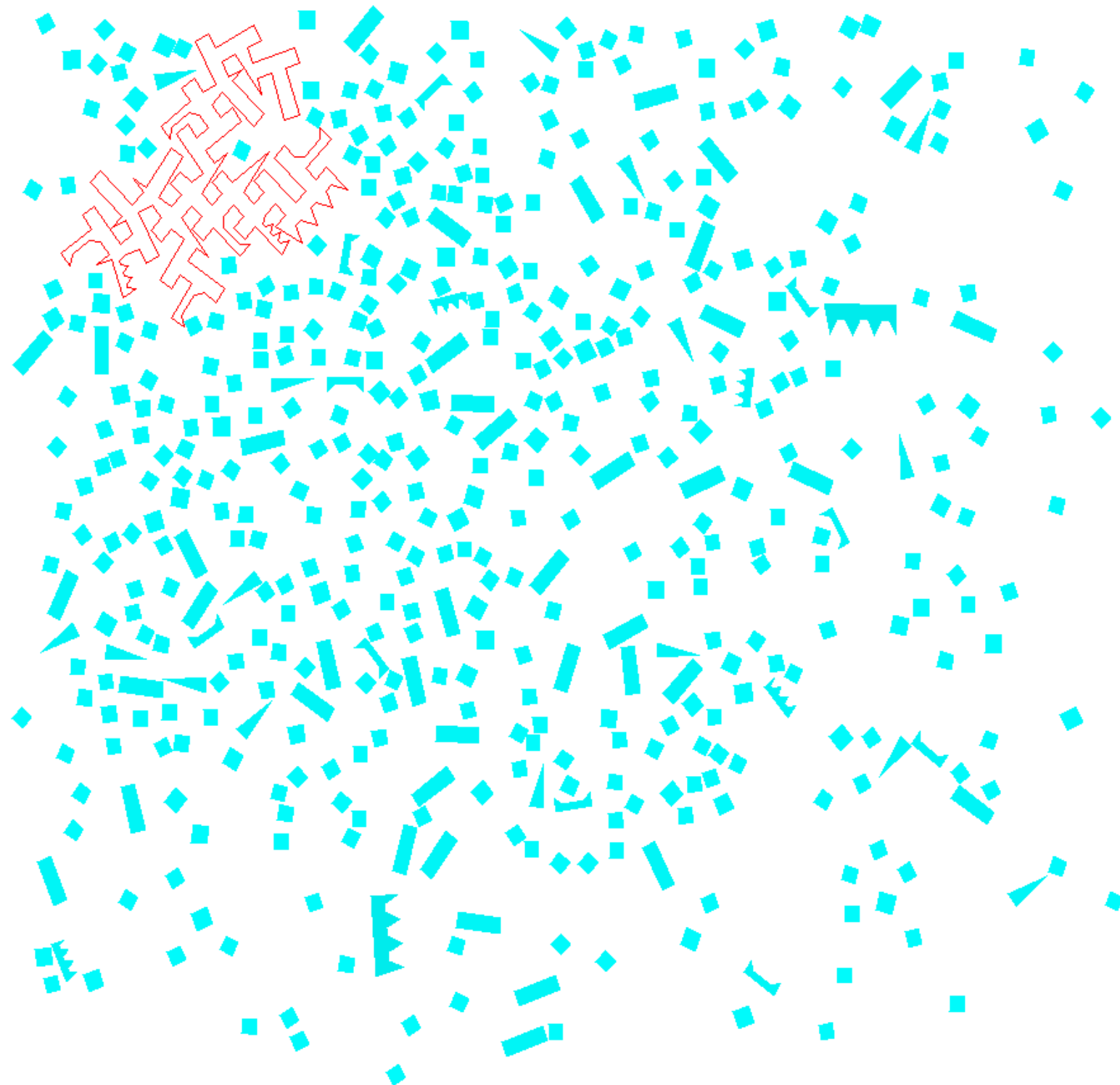




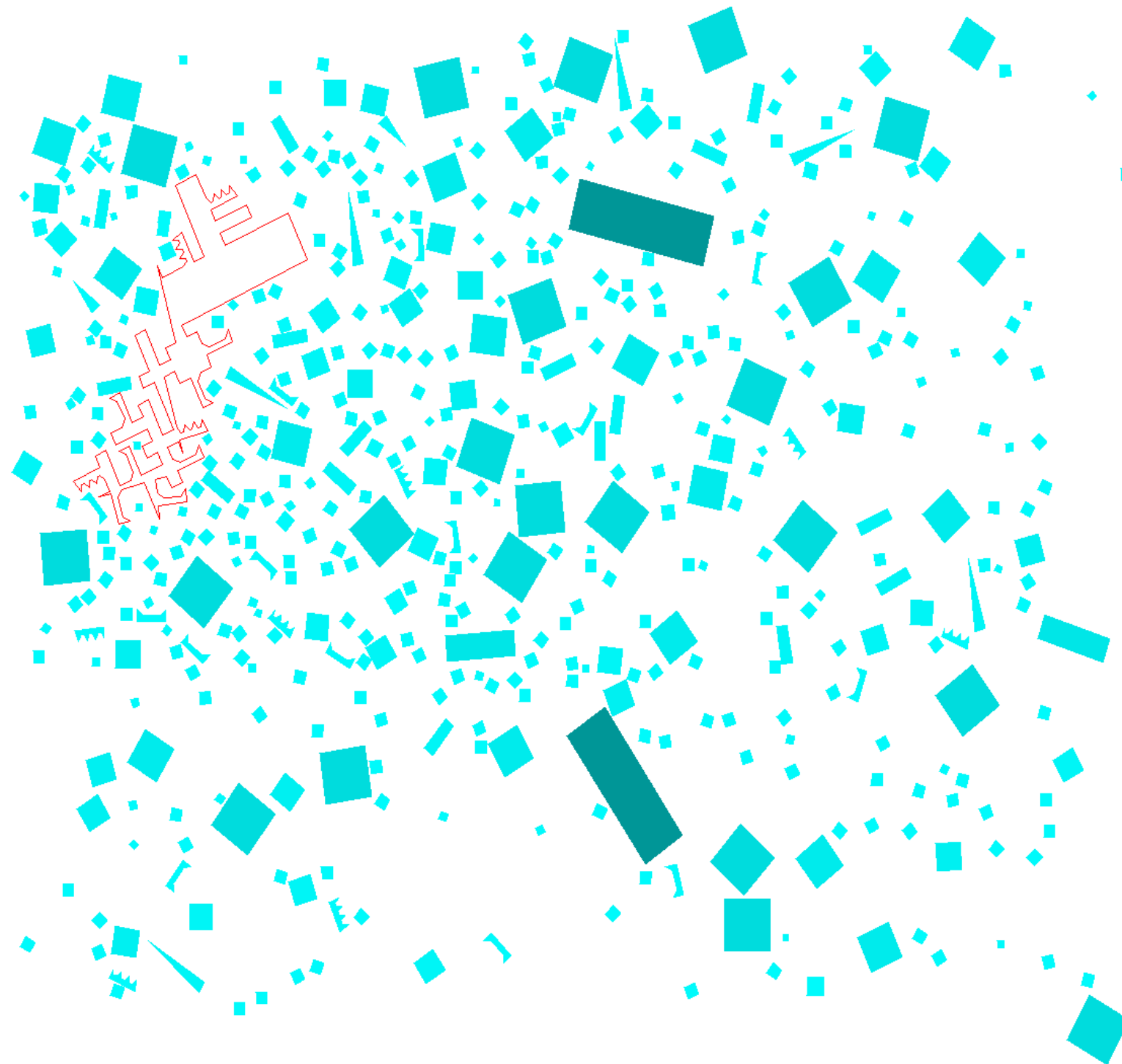
The Problems

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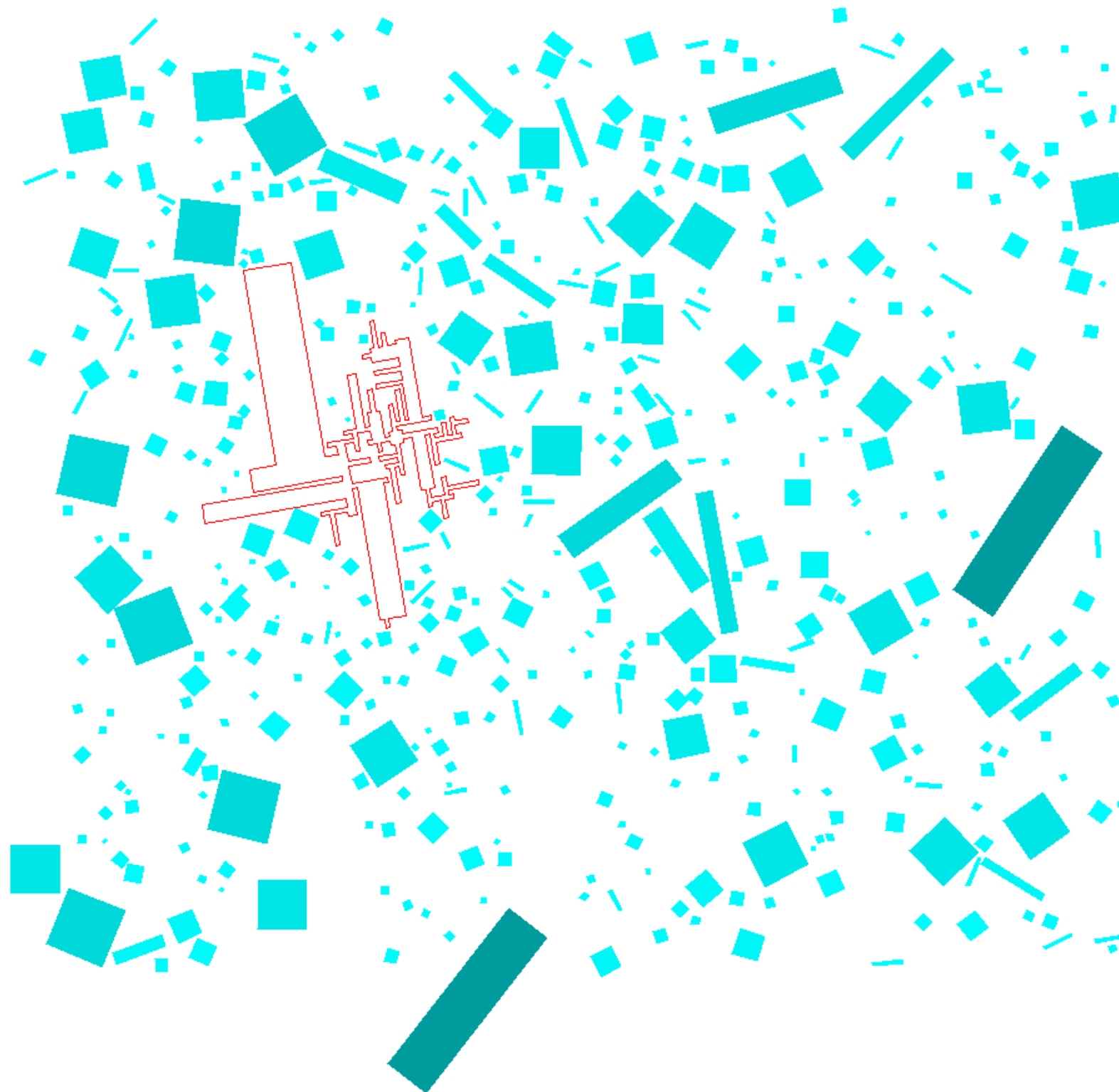
Problem 11



Problem 16

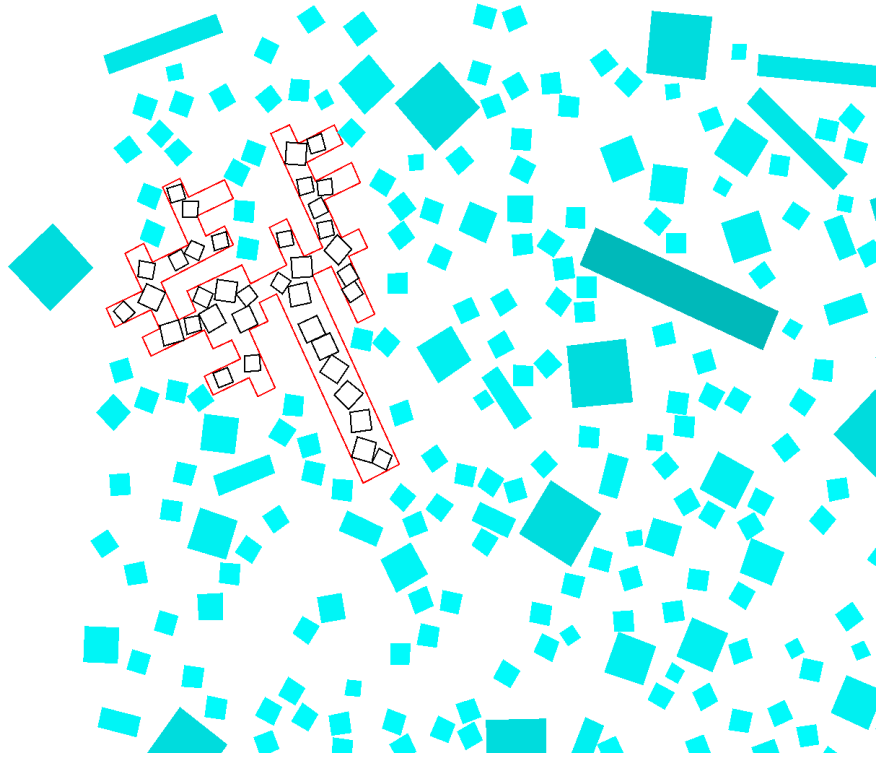


Problem 19

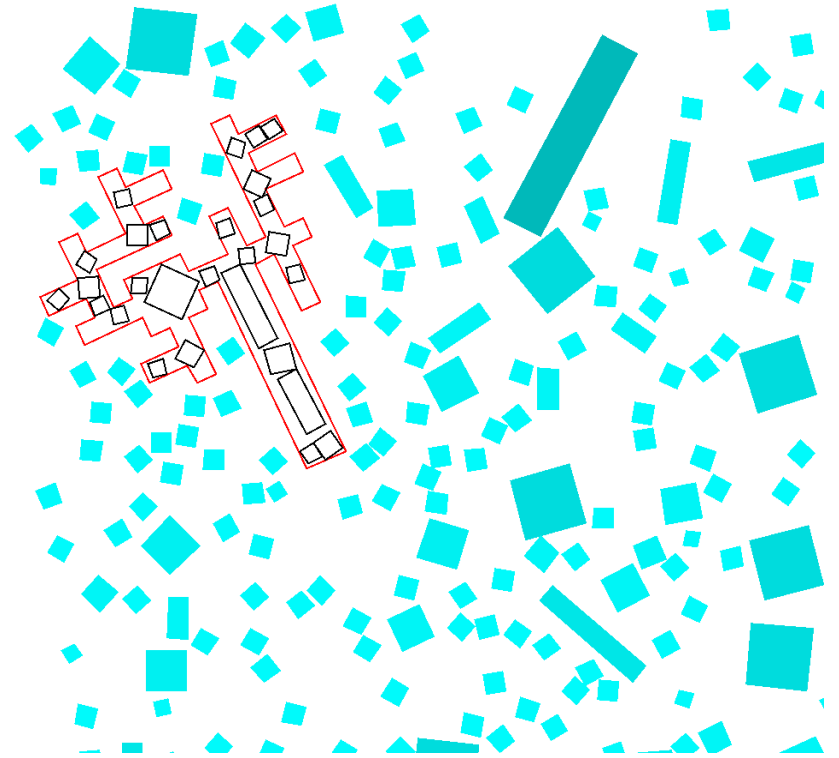


A Quiz

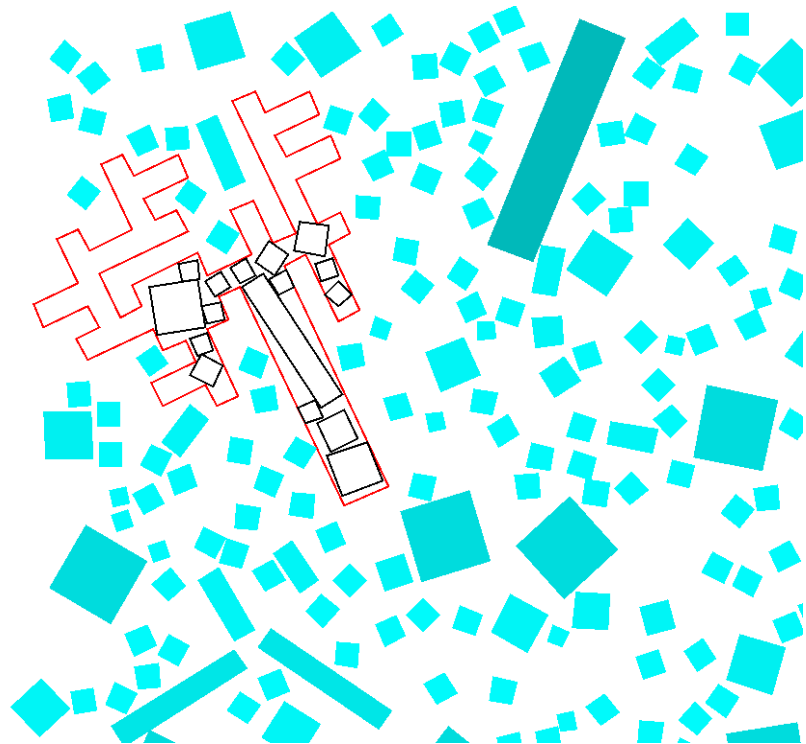
A



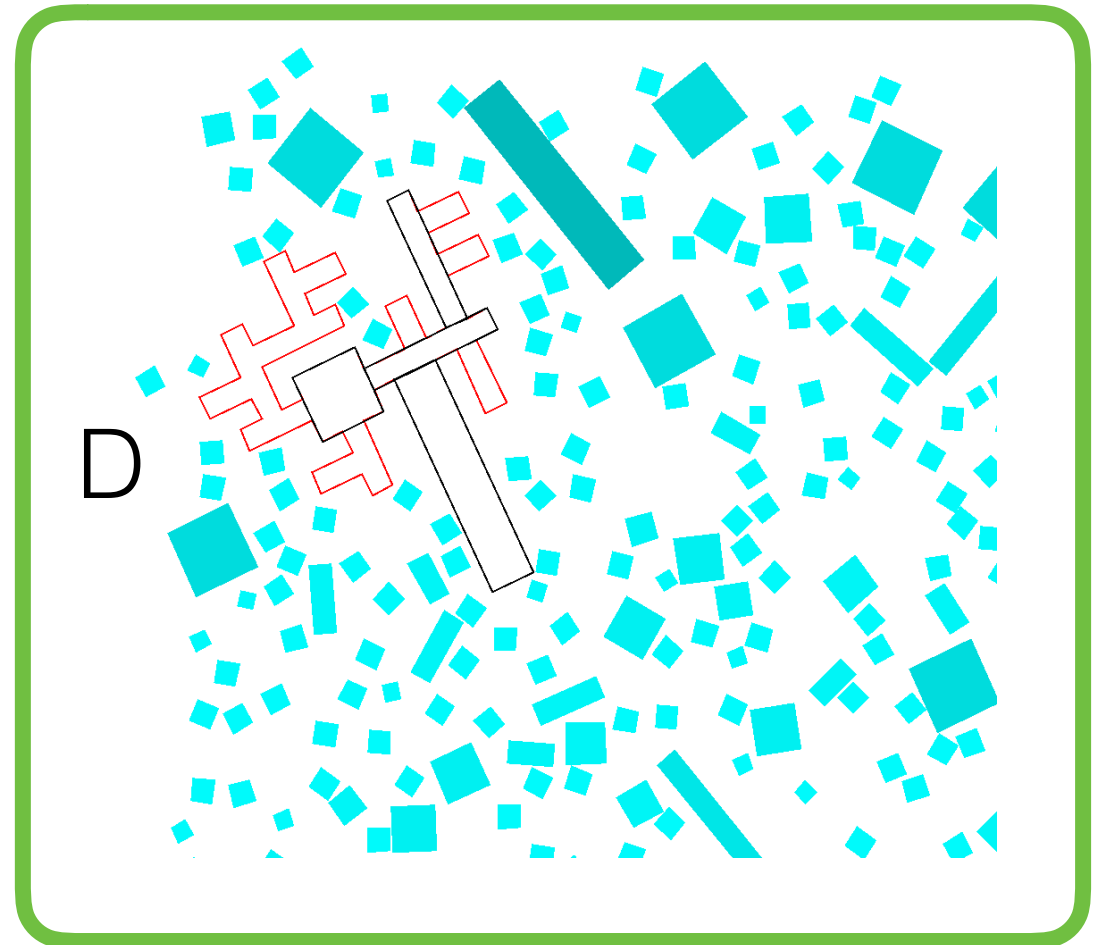
B

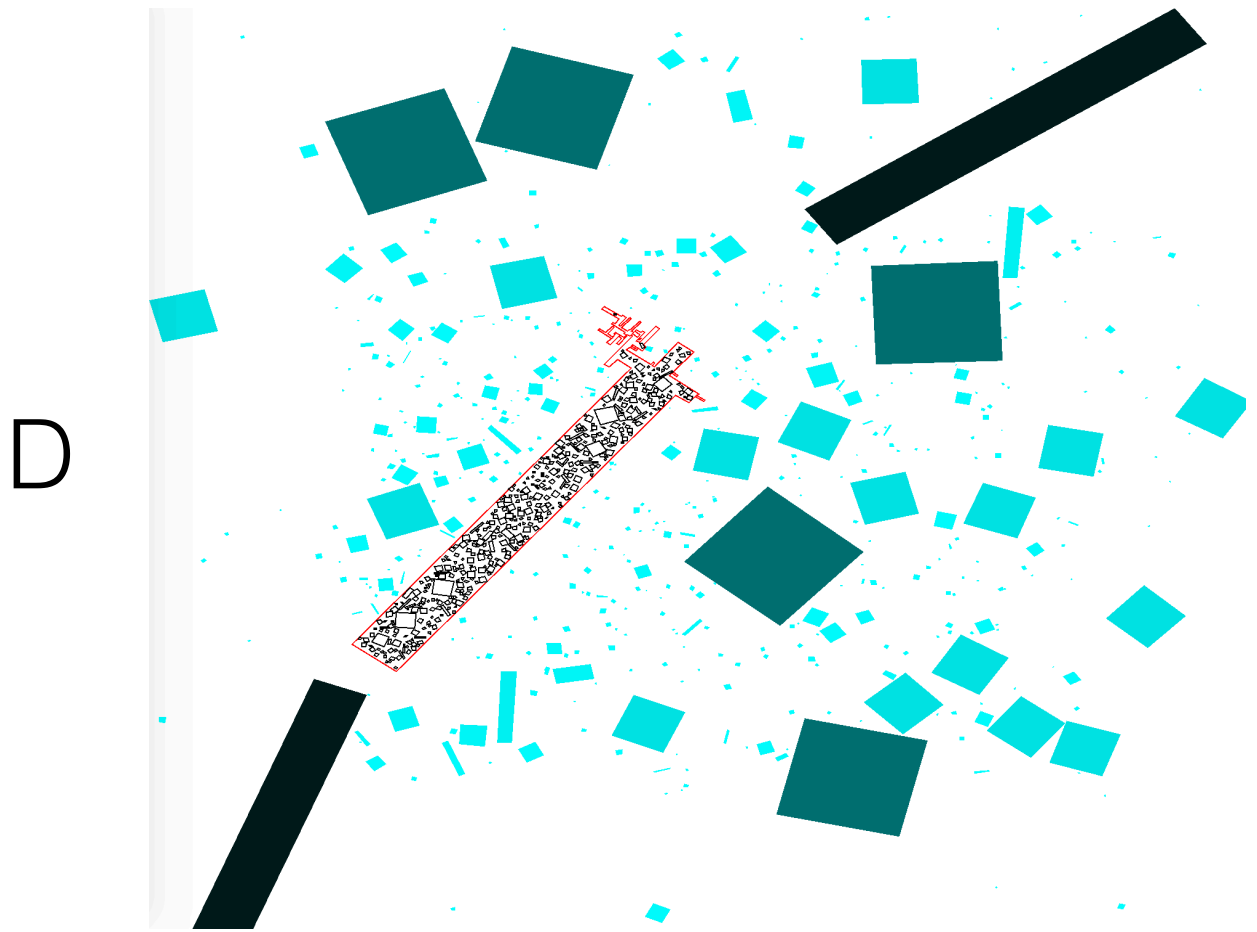
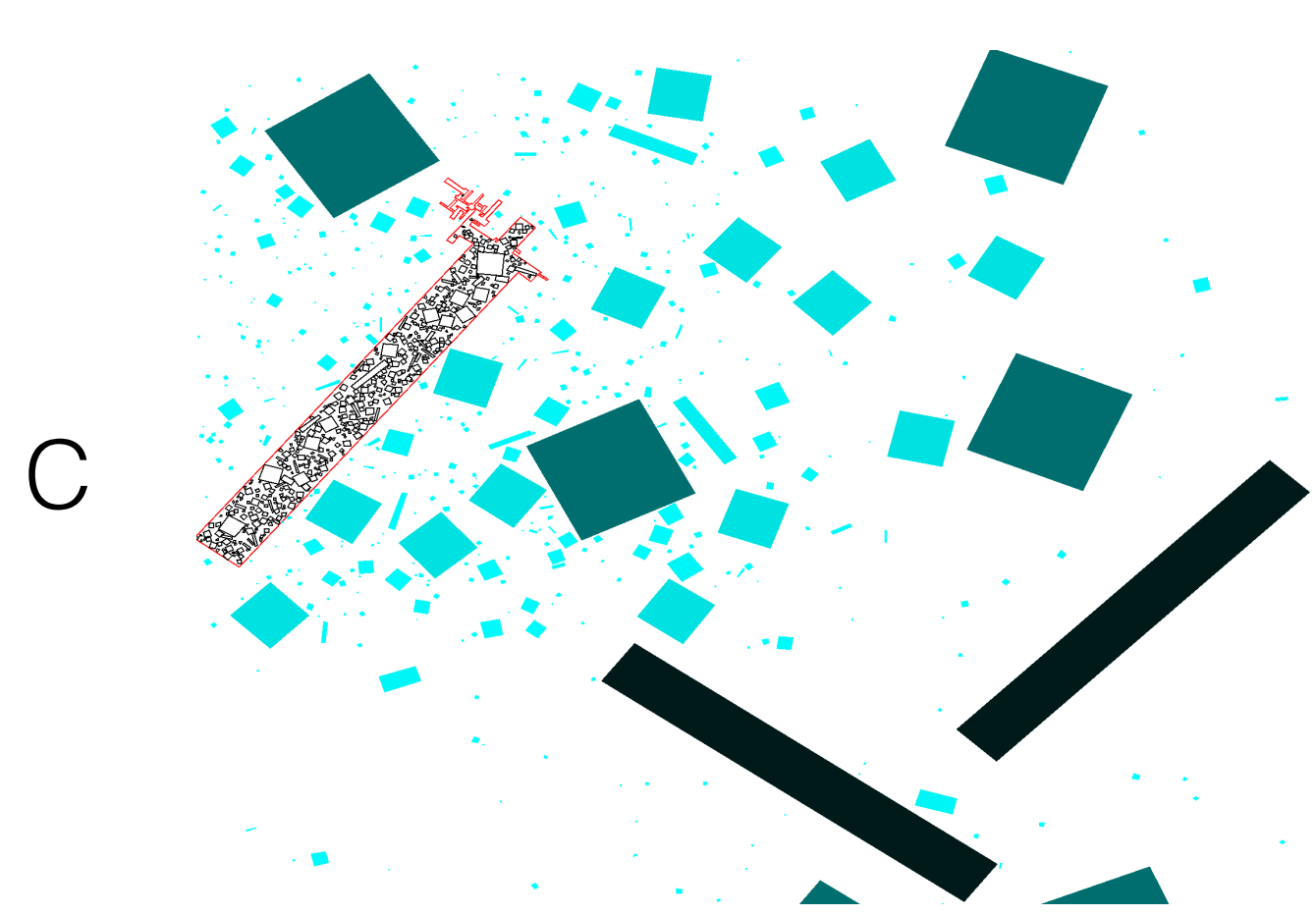
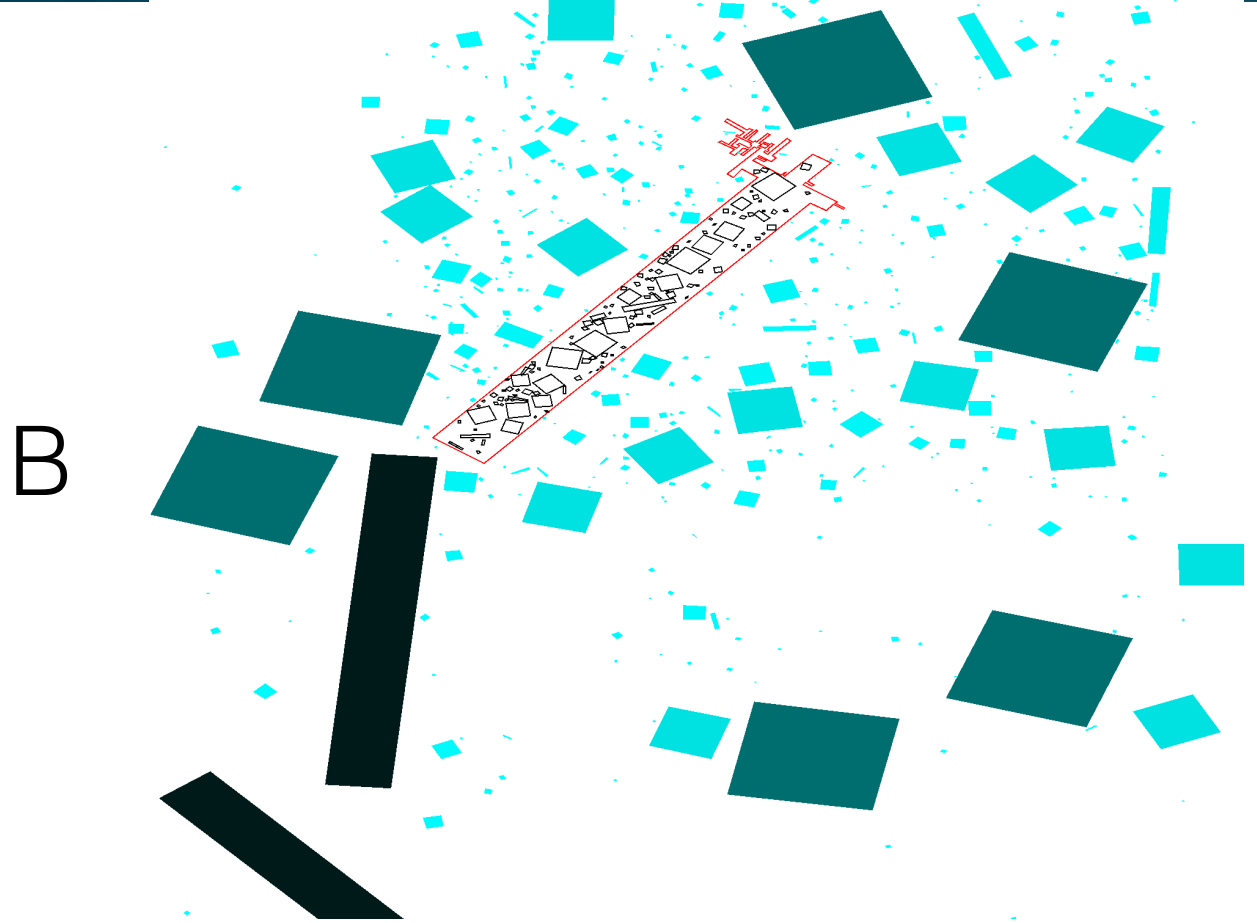
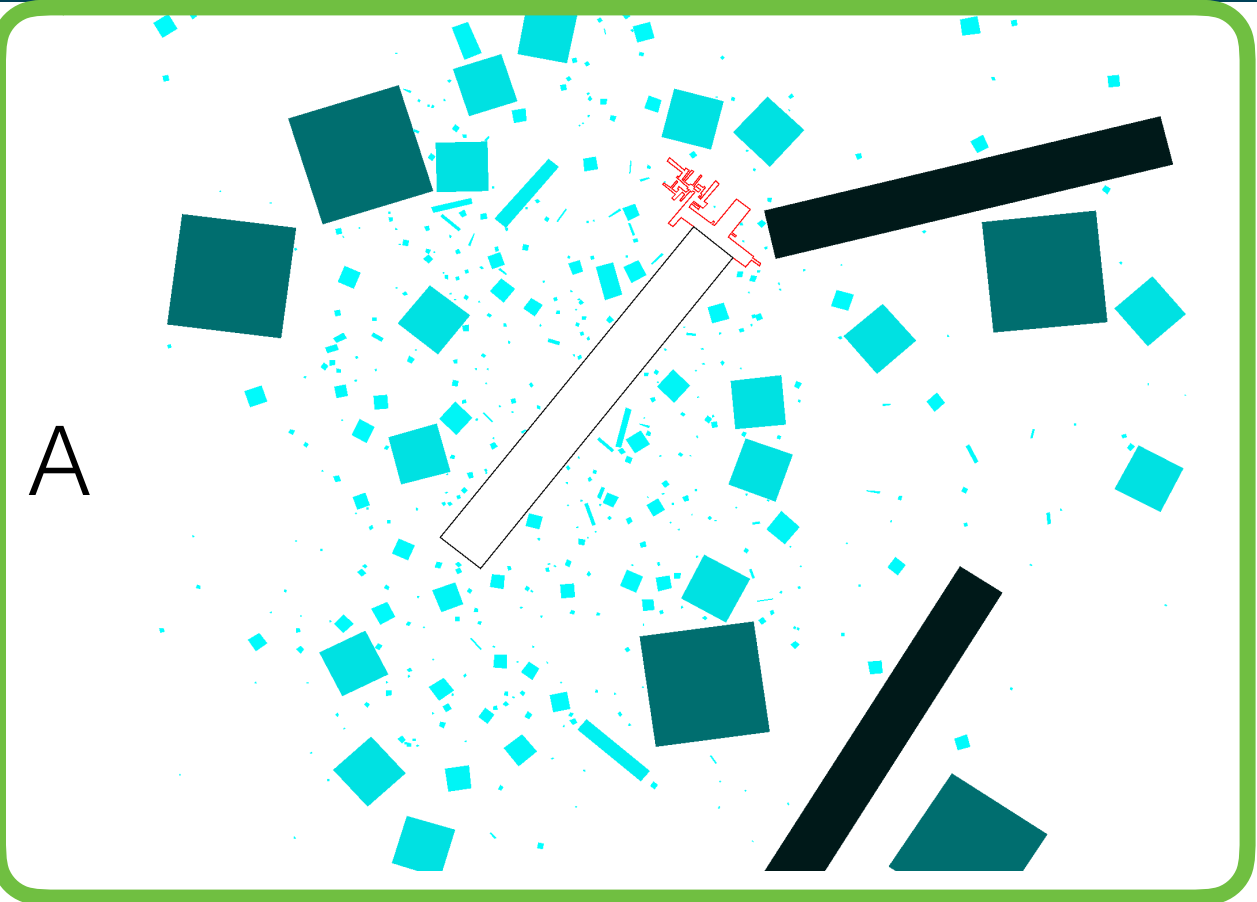


C



D

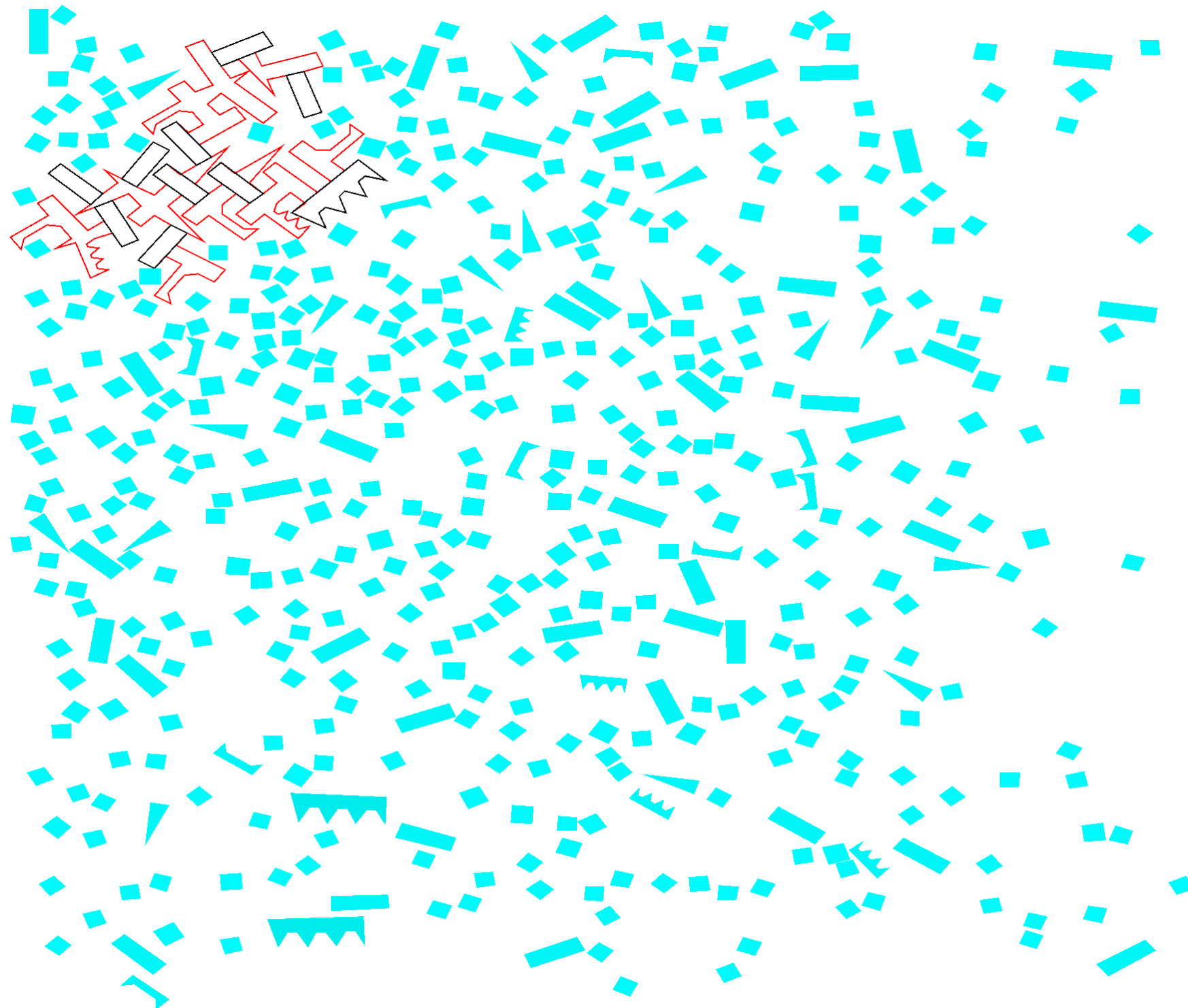


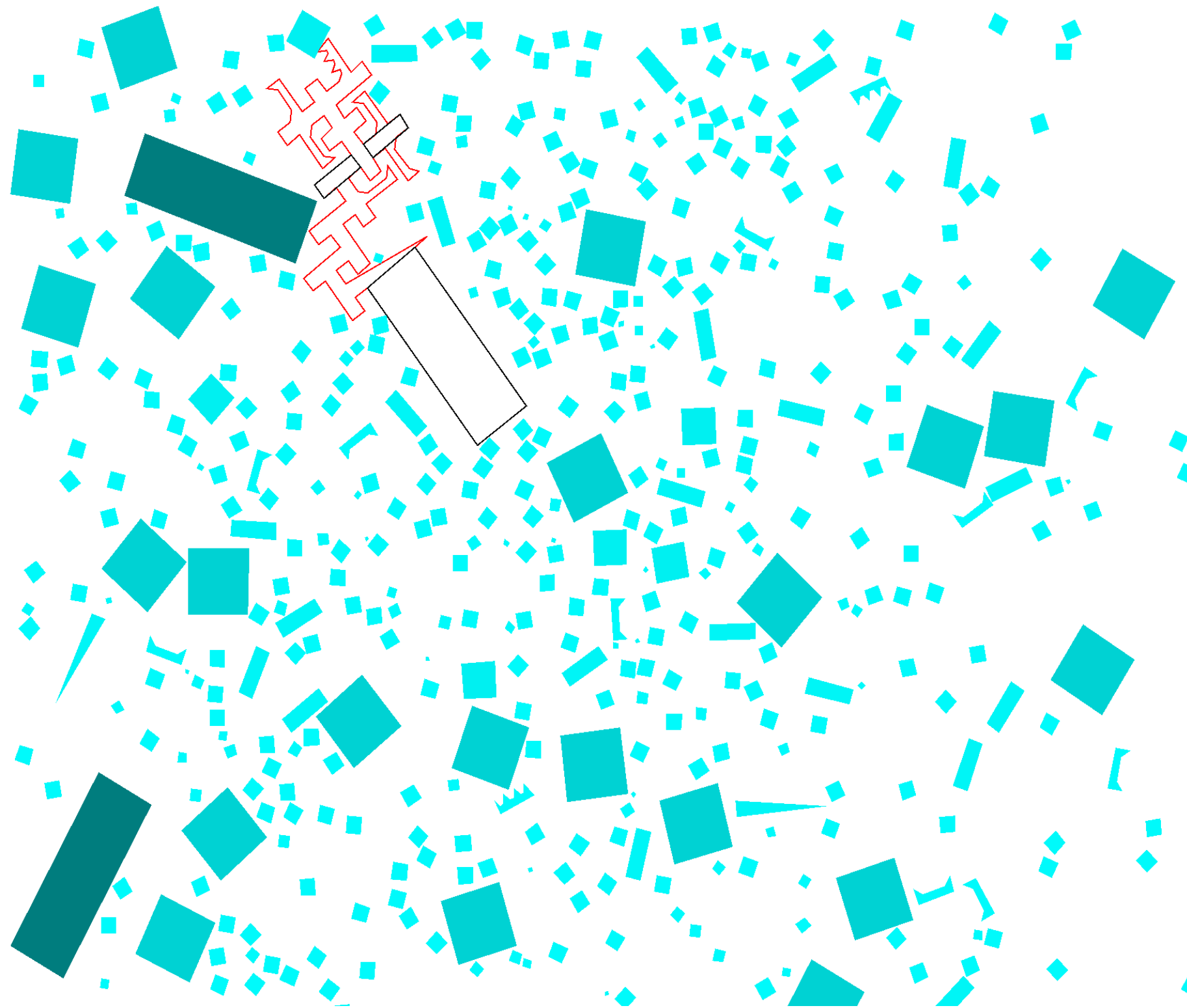


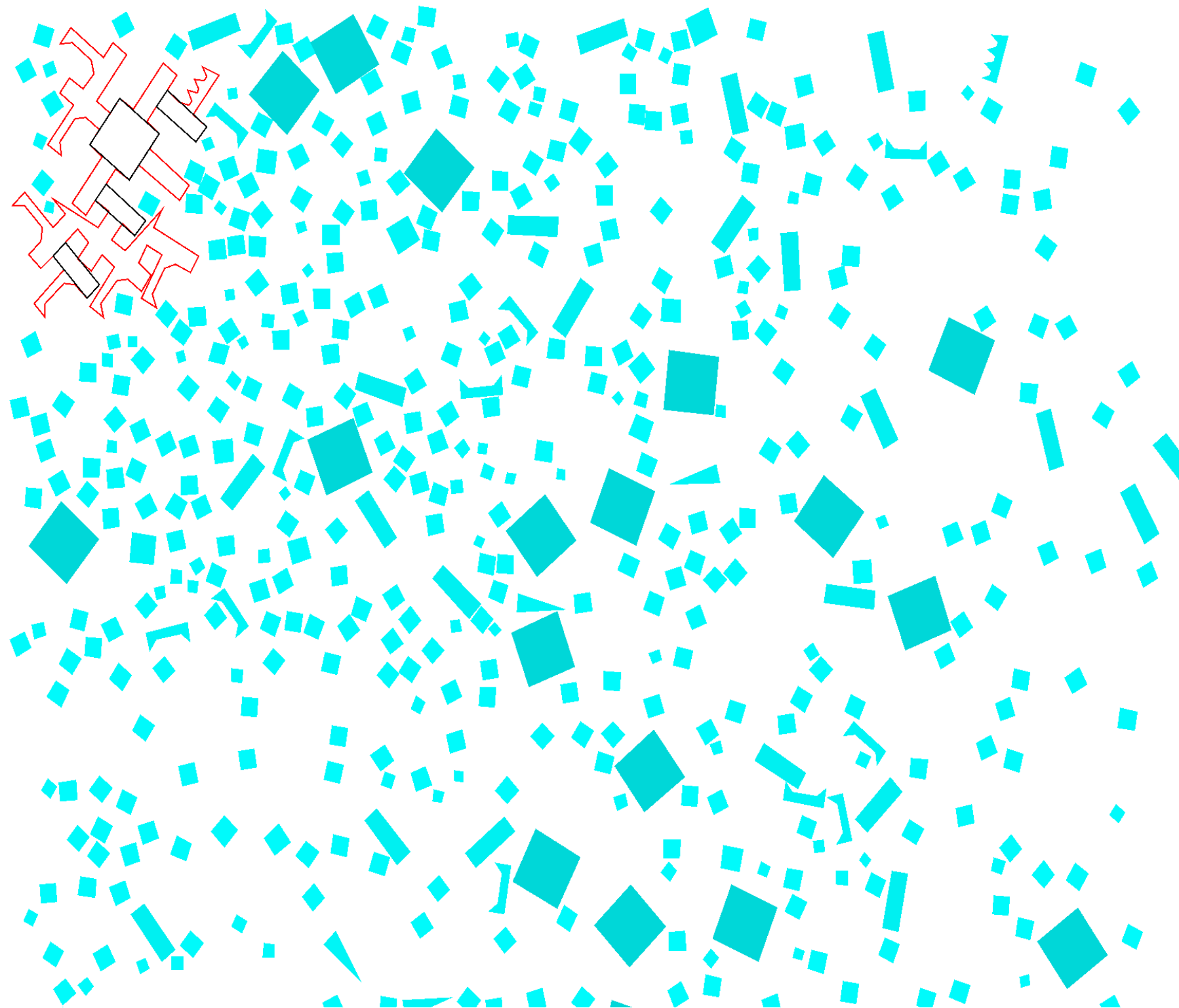
Stable Era

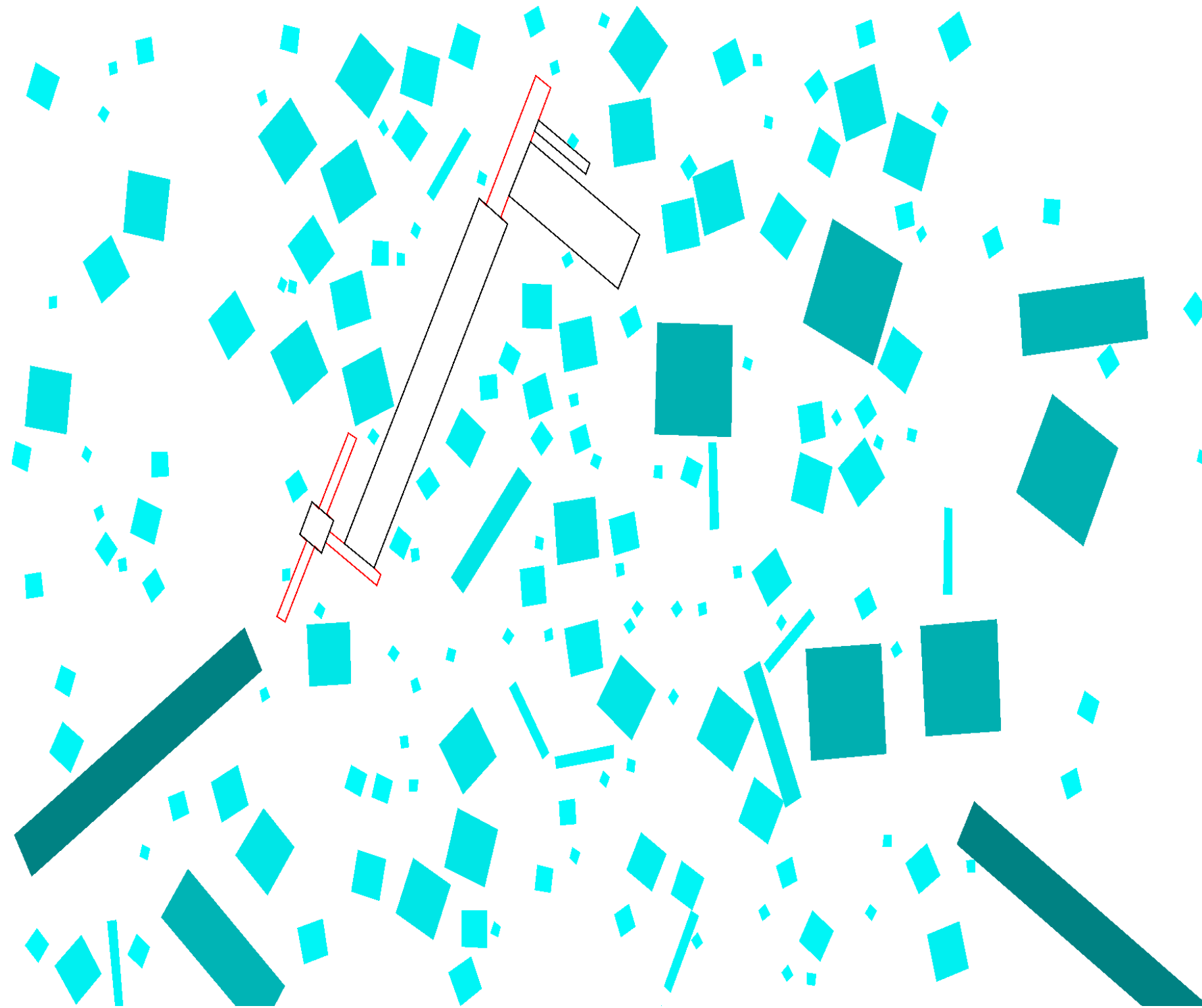
Wednesday, 13 Dec, ~21:00,
team [santander](#)

Problem 11









Questions?

(this is not the end yet)

Please, provide your feedback.

(link to form in your email and on Moodle page)

The Competition

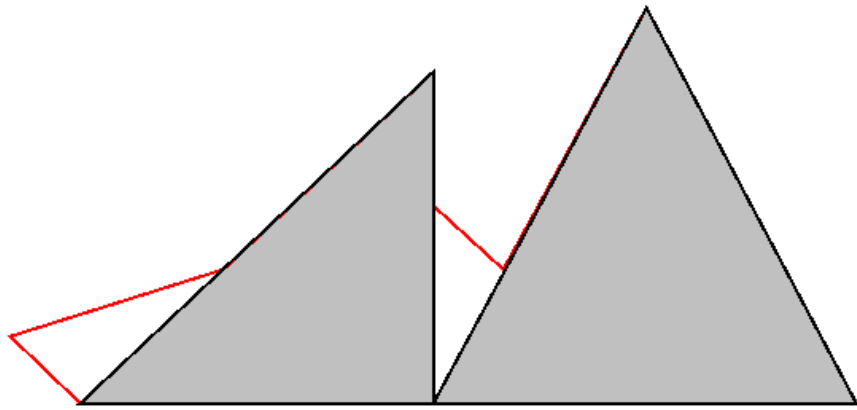
Third Place

Alhambra

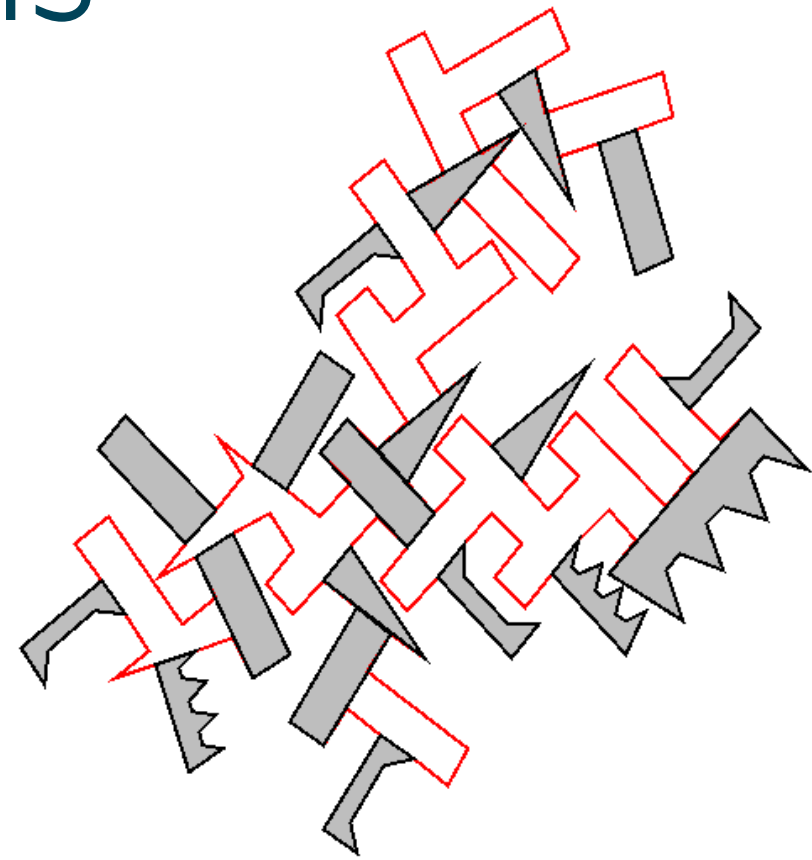


Solutions

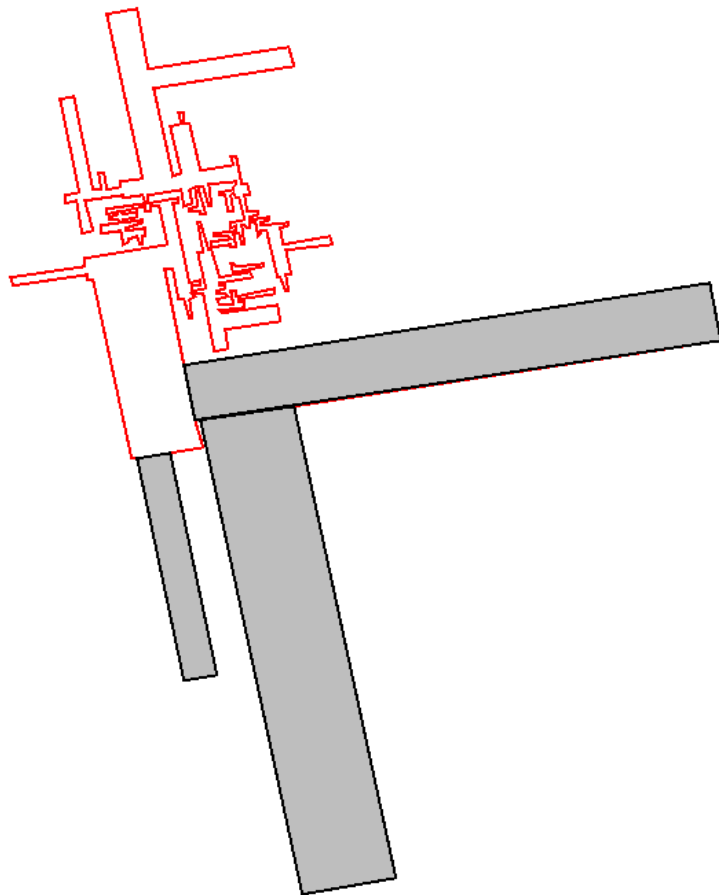
2



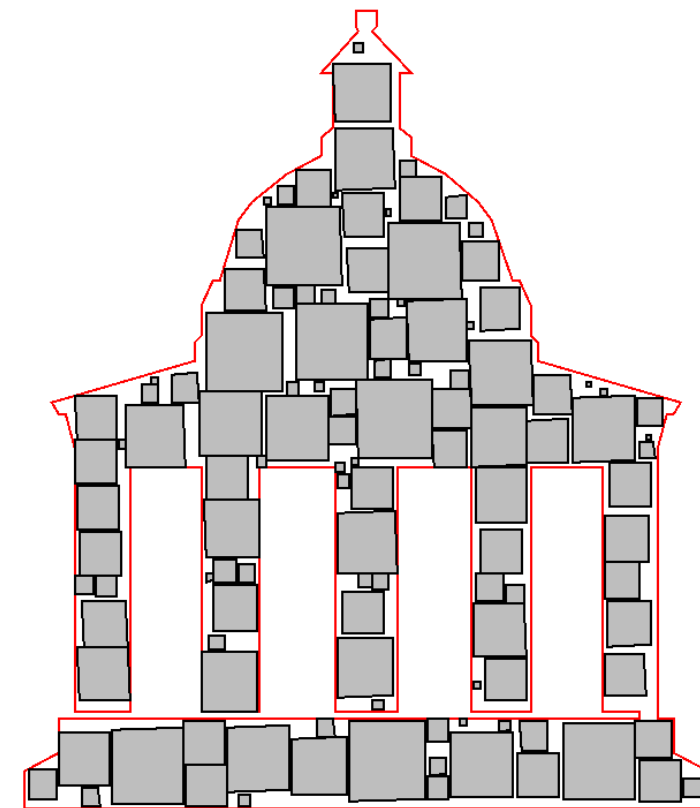
11



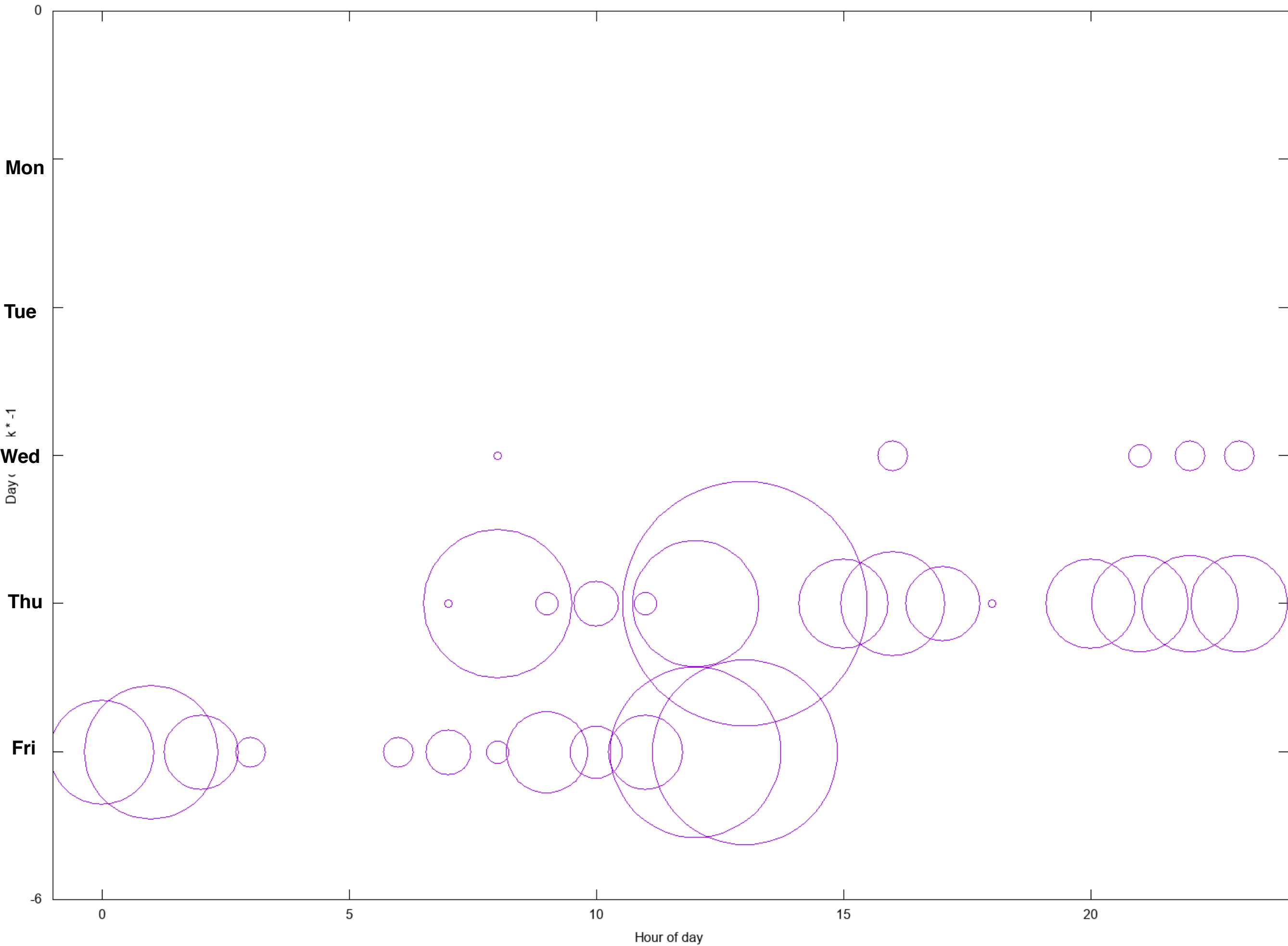
20



30



Number of submissions per timeslice: Team alhambra



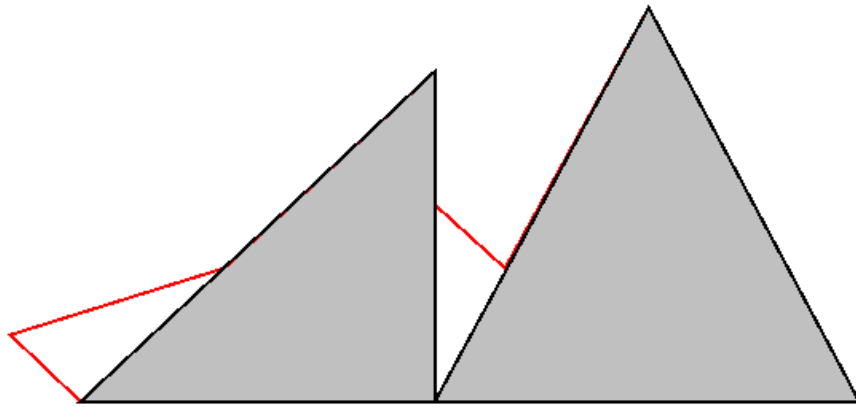
Second Place

Toledo



Solutions

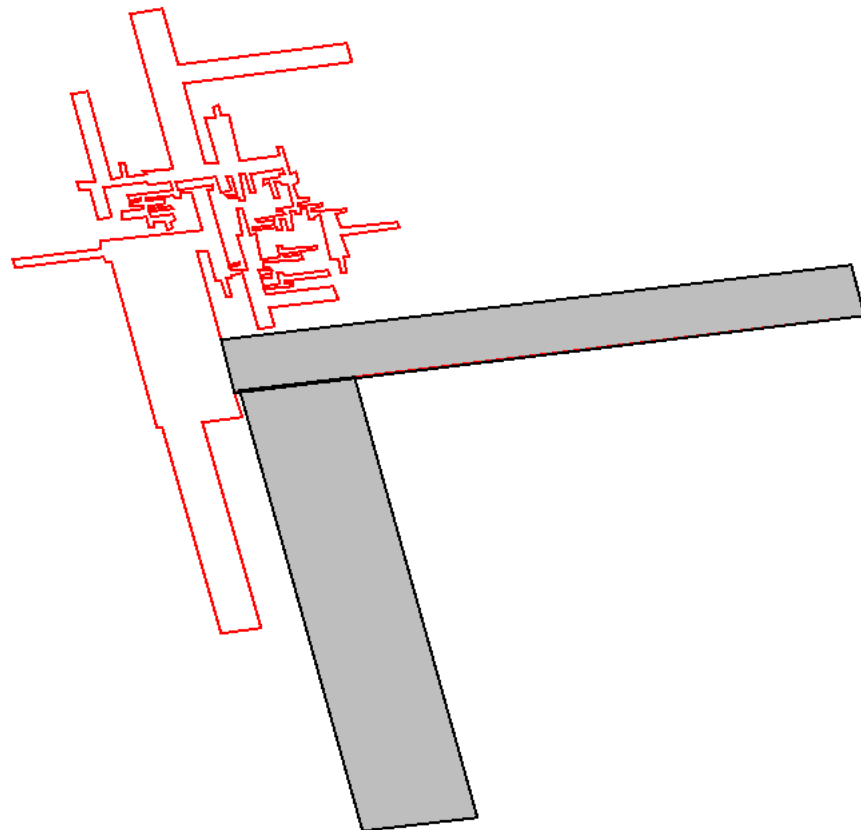
2



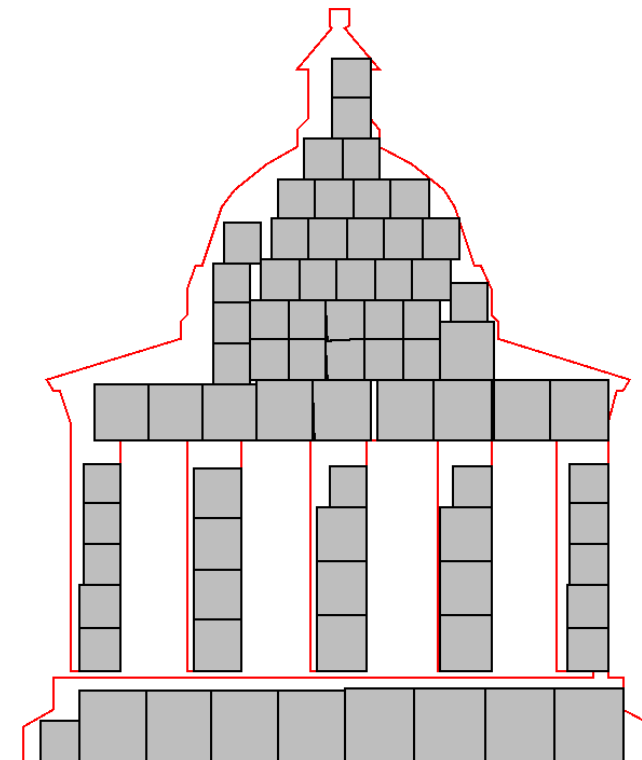
11



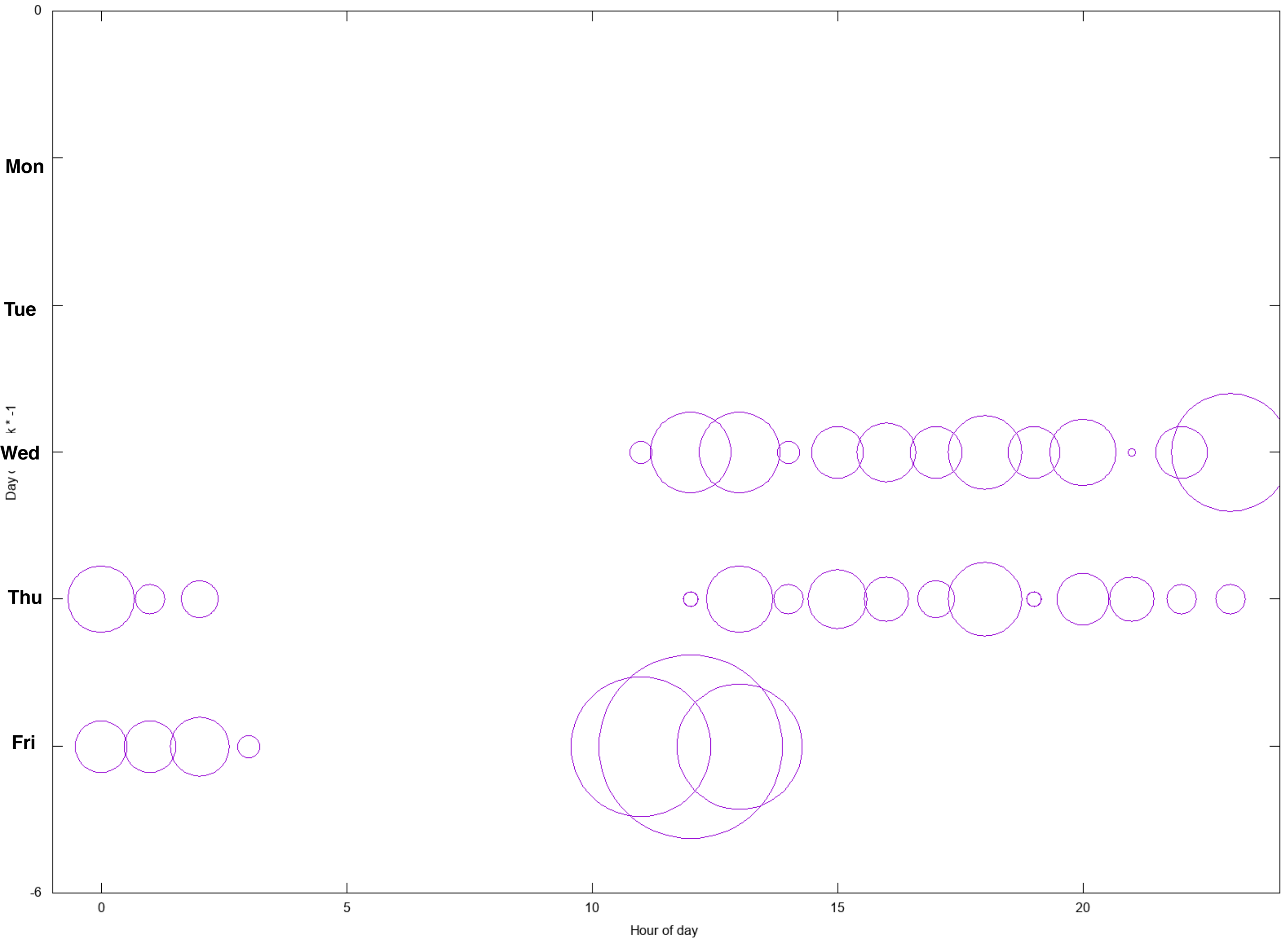
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30

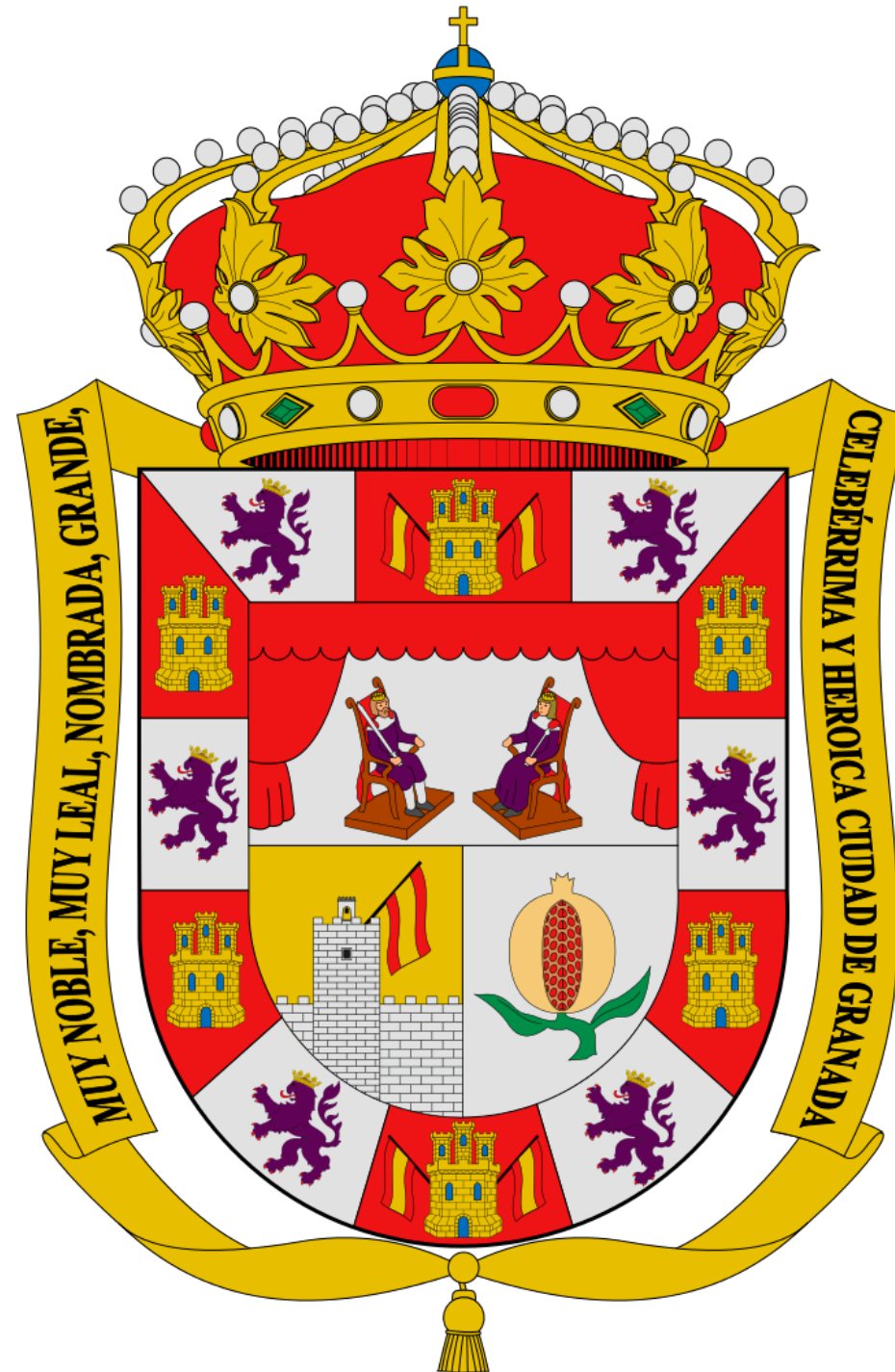


Number of submissions per timeslice: Team toledo



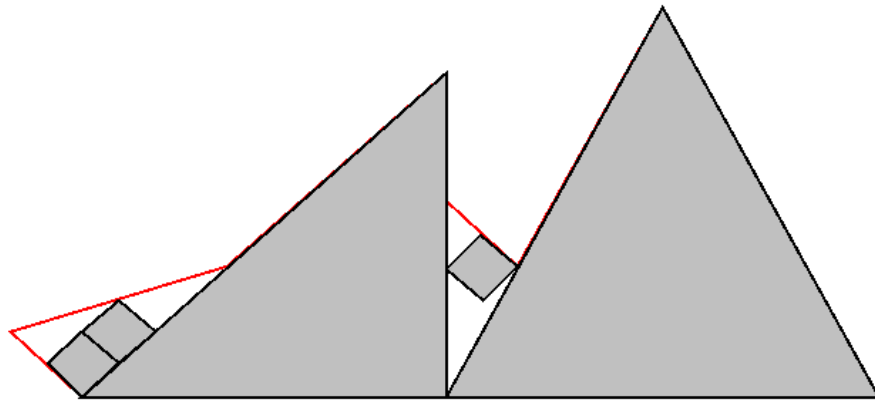
The Champions

Granada

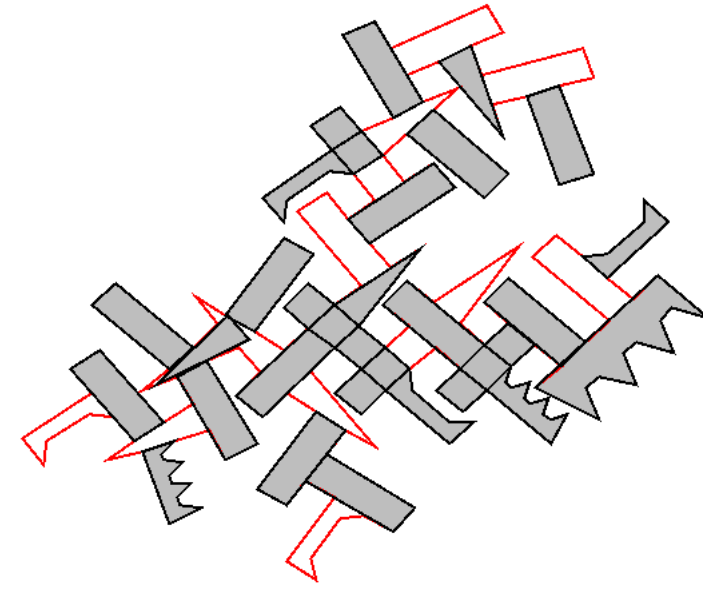


Solutions

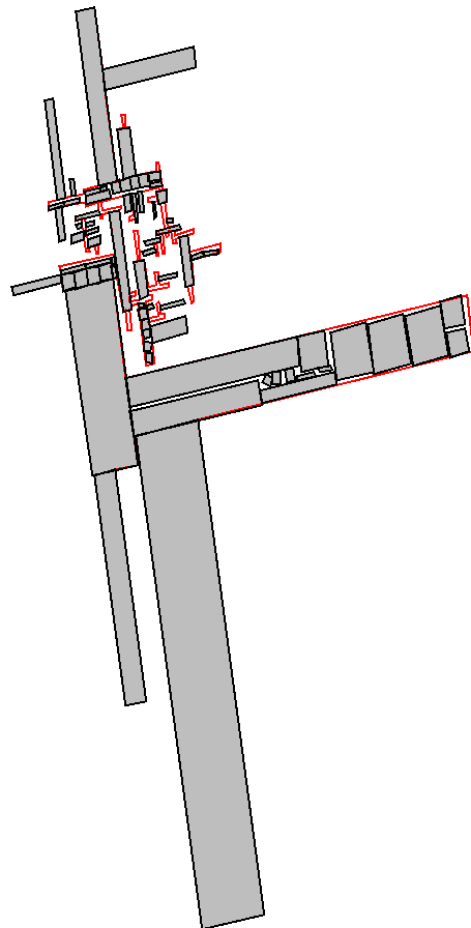
2



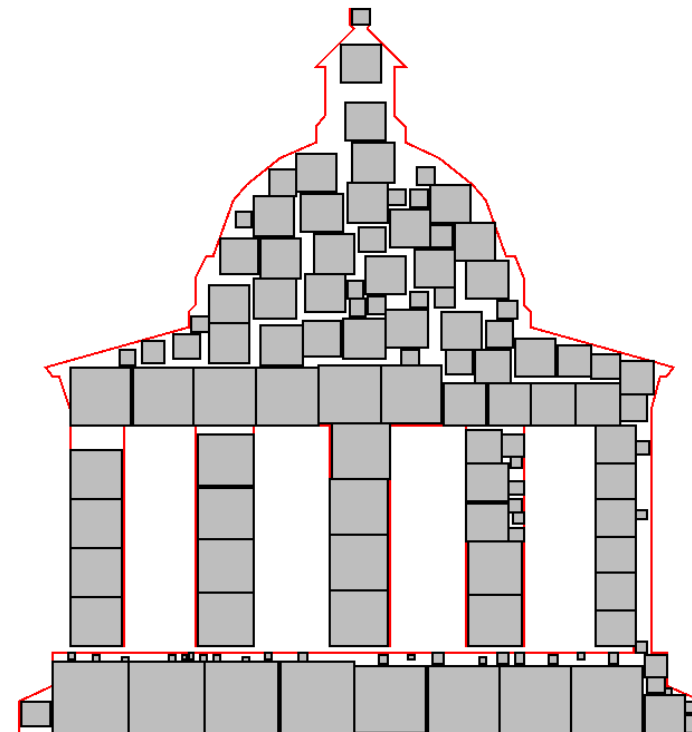
11



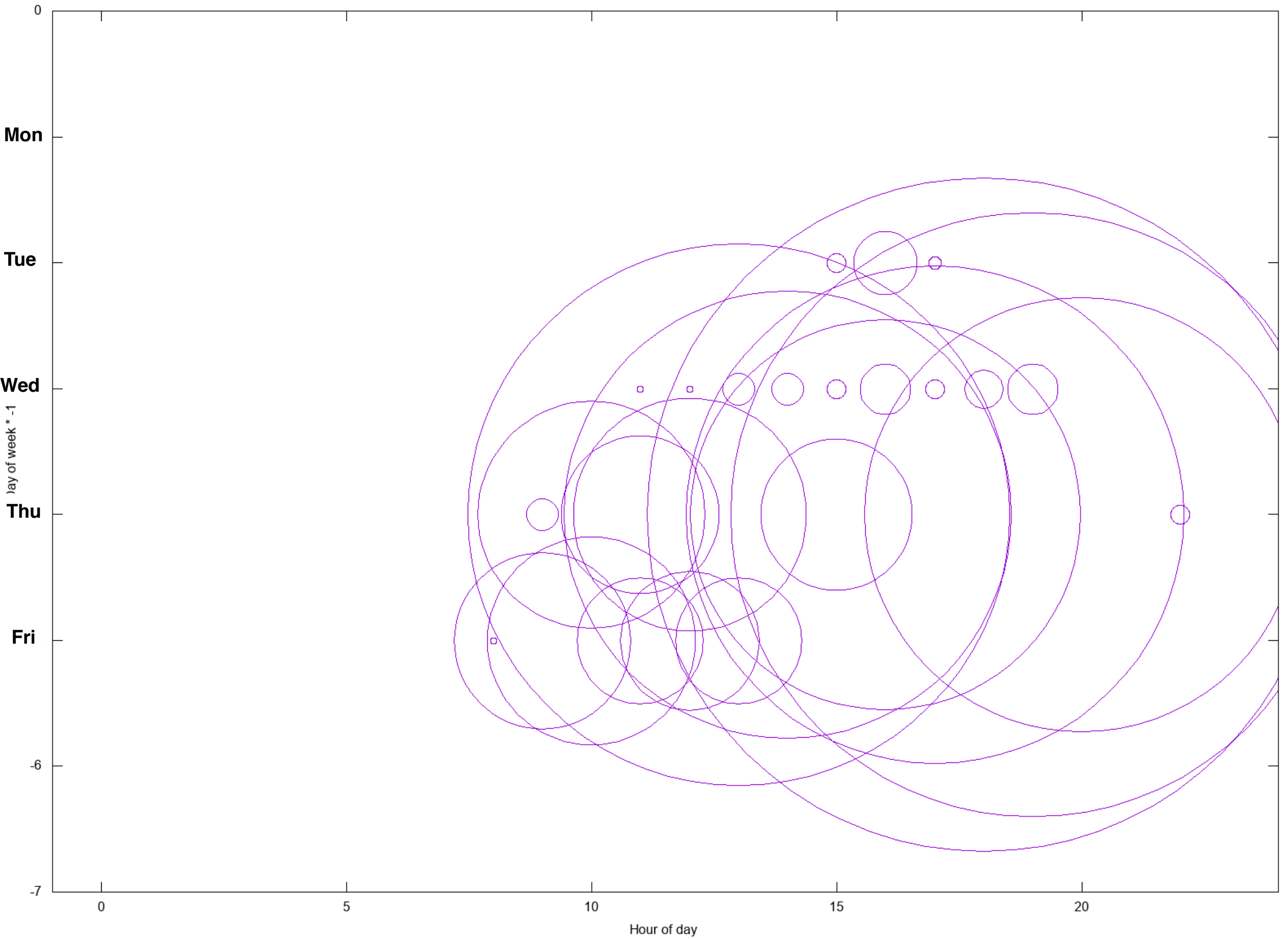
20



30

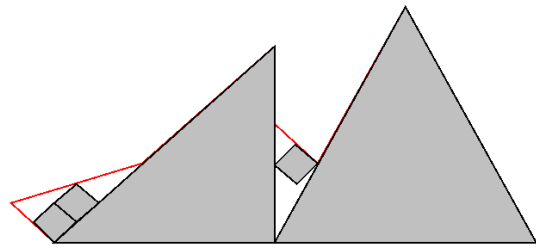


Number of submissions per timeslice: Team granada

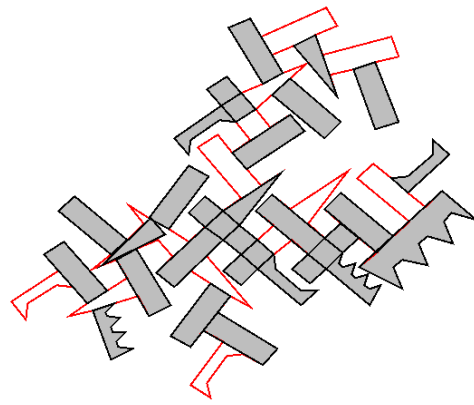


Comparing Approaches

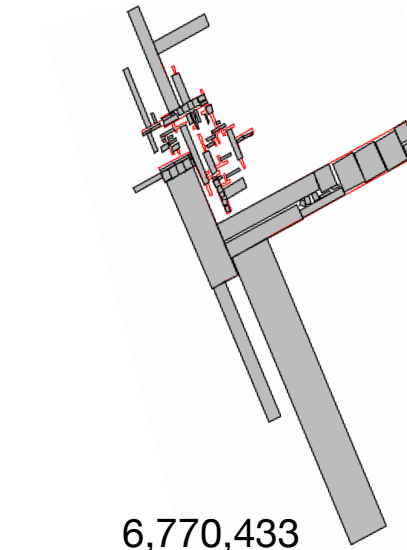
1



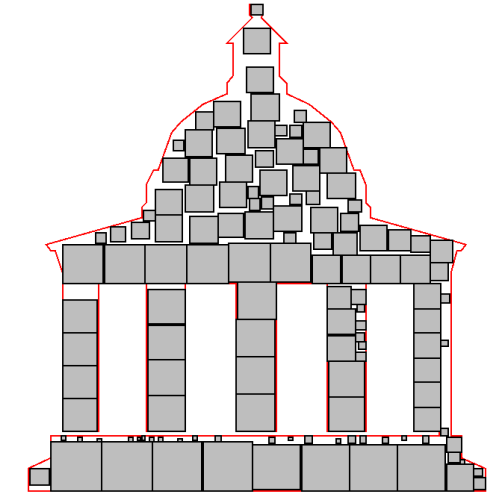
488



197

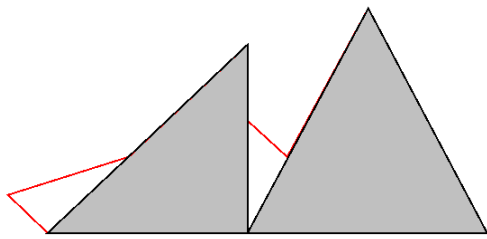


6,770,433



825,780

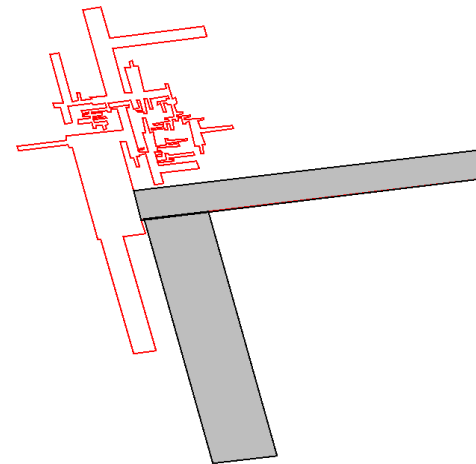
2



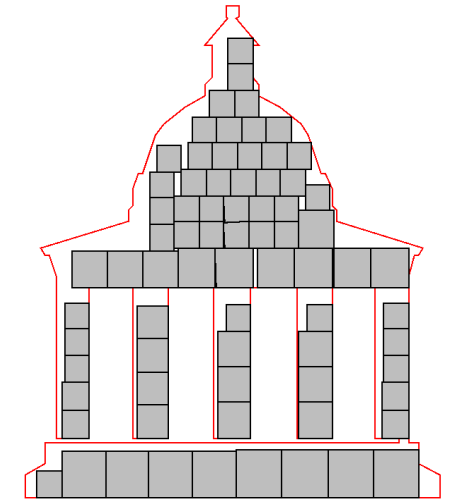
486.5



55.643

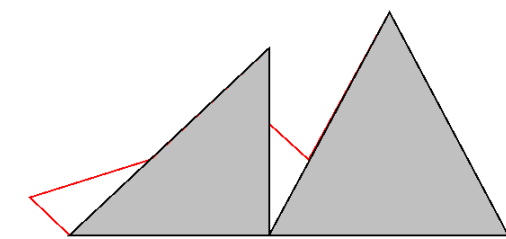


8,218,624

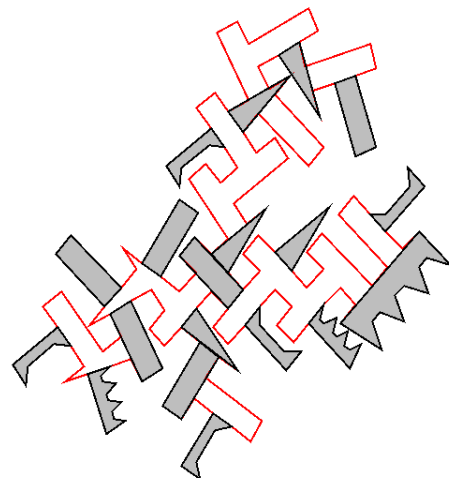


843,951

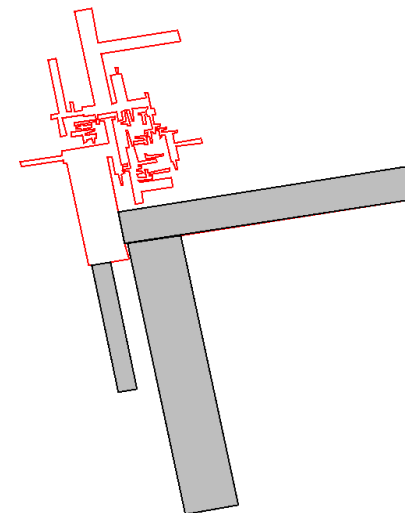
3



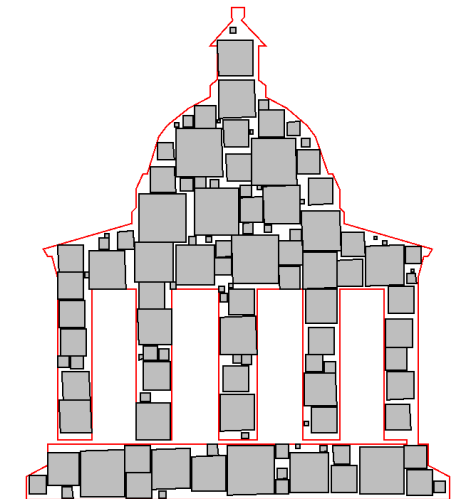
486.5



136



8,372,288



790,826

If you want more...

 Hash Code

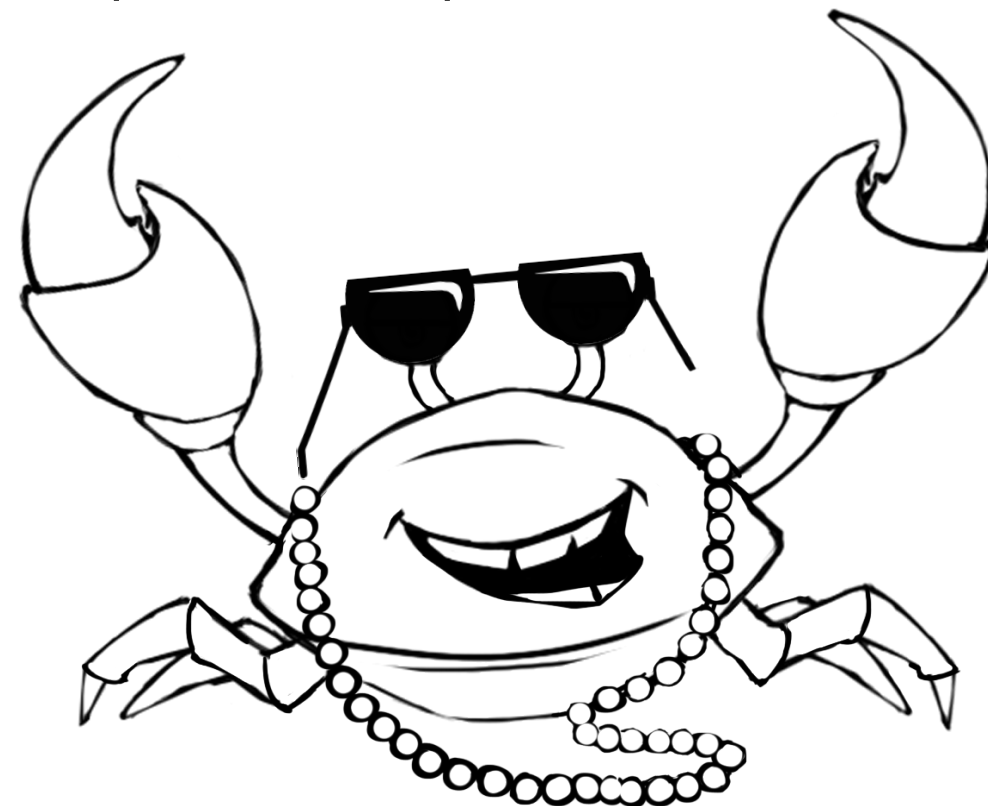
 ICFP Programming Contest

In Conclusion

Intractable problems can be efficiently *approximated*.

Different instances of the *same* problem might require different algorithms and approaches.

Do not be afraid to *exploit* the problem and try *hybrid* strategies.



Thanks!