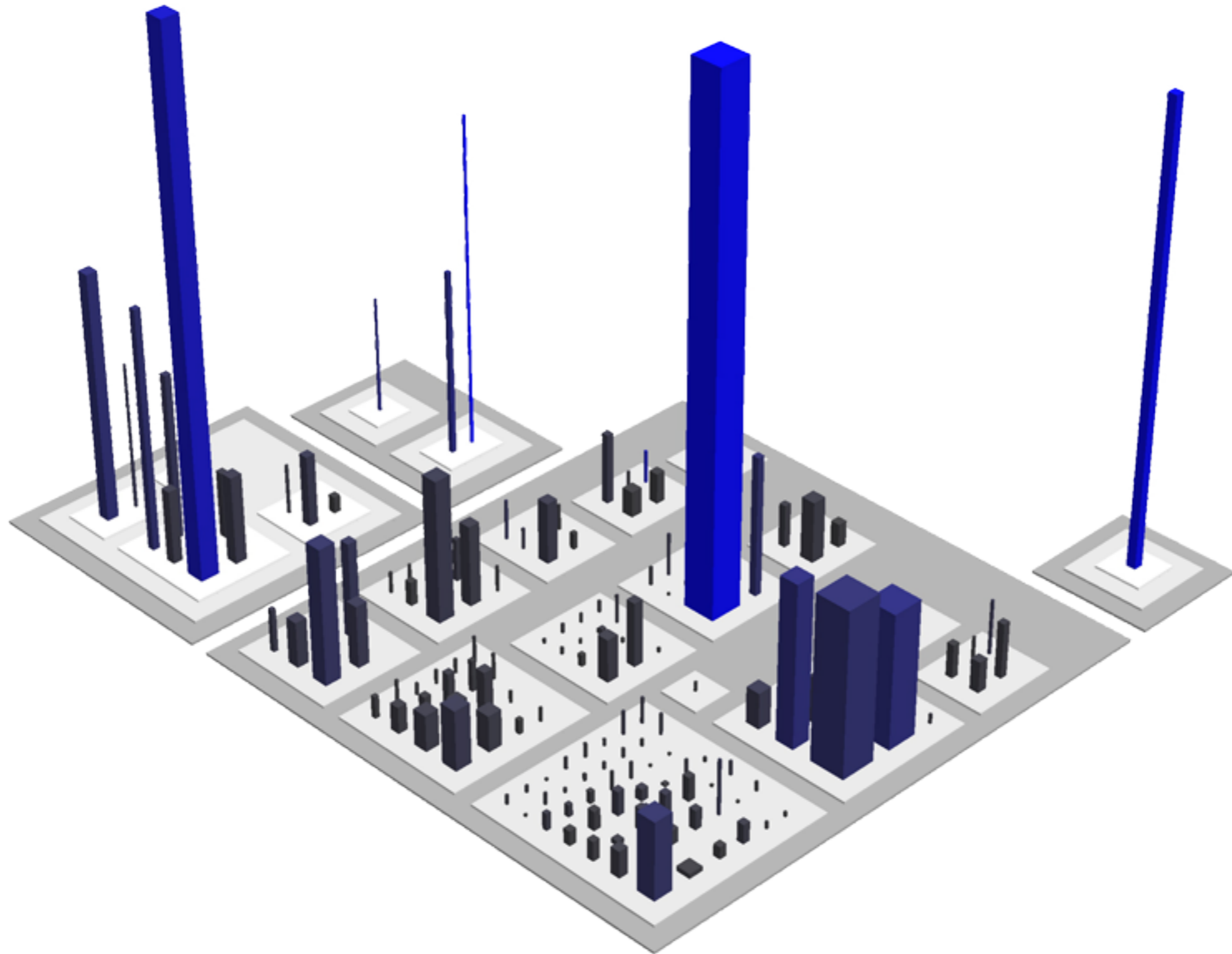


Towards Well Planned Code City

Natalia Tymchuk, Michele Lanza



CodeCity



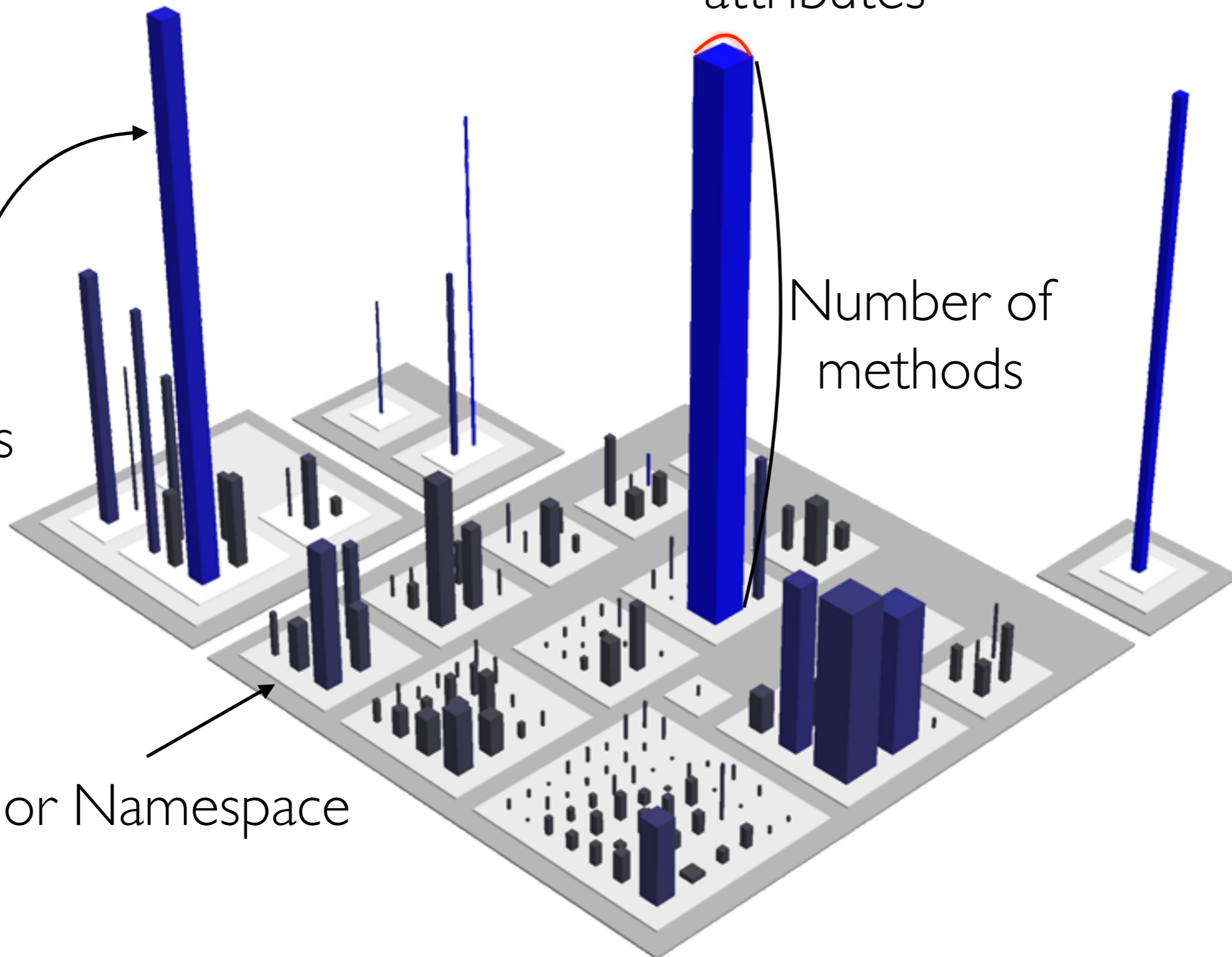
CodeCity

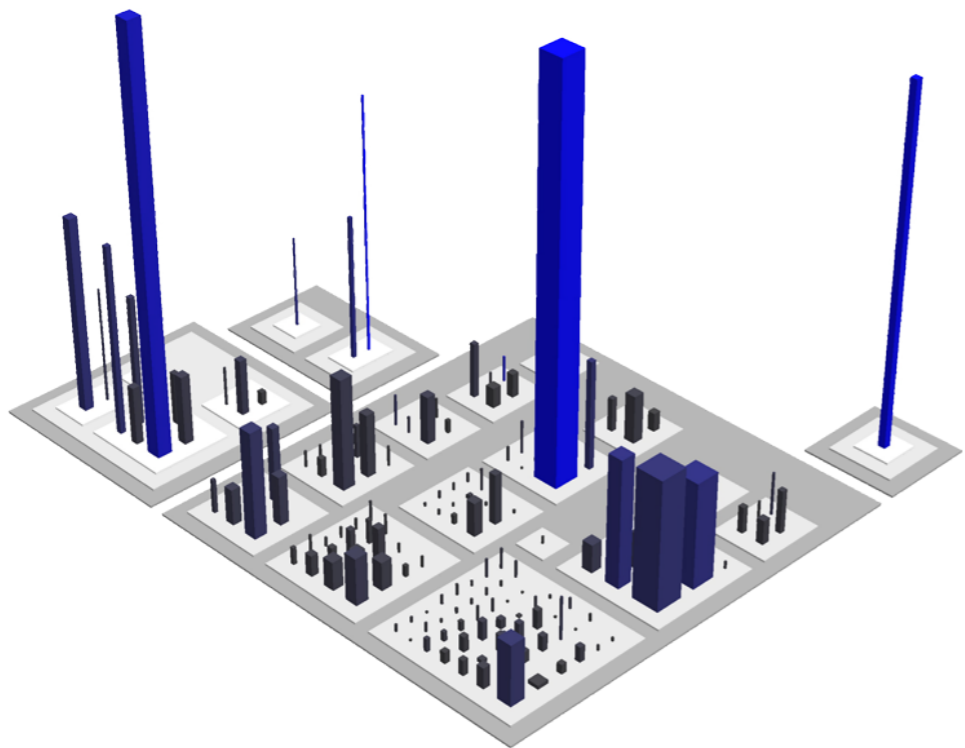
Number of attributes

Number of methods

Class

Package or Namespace







Manhattan



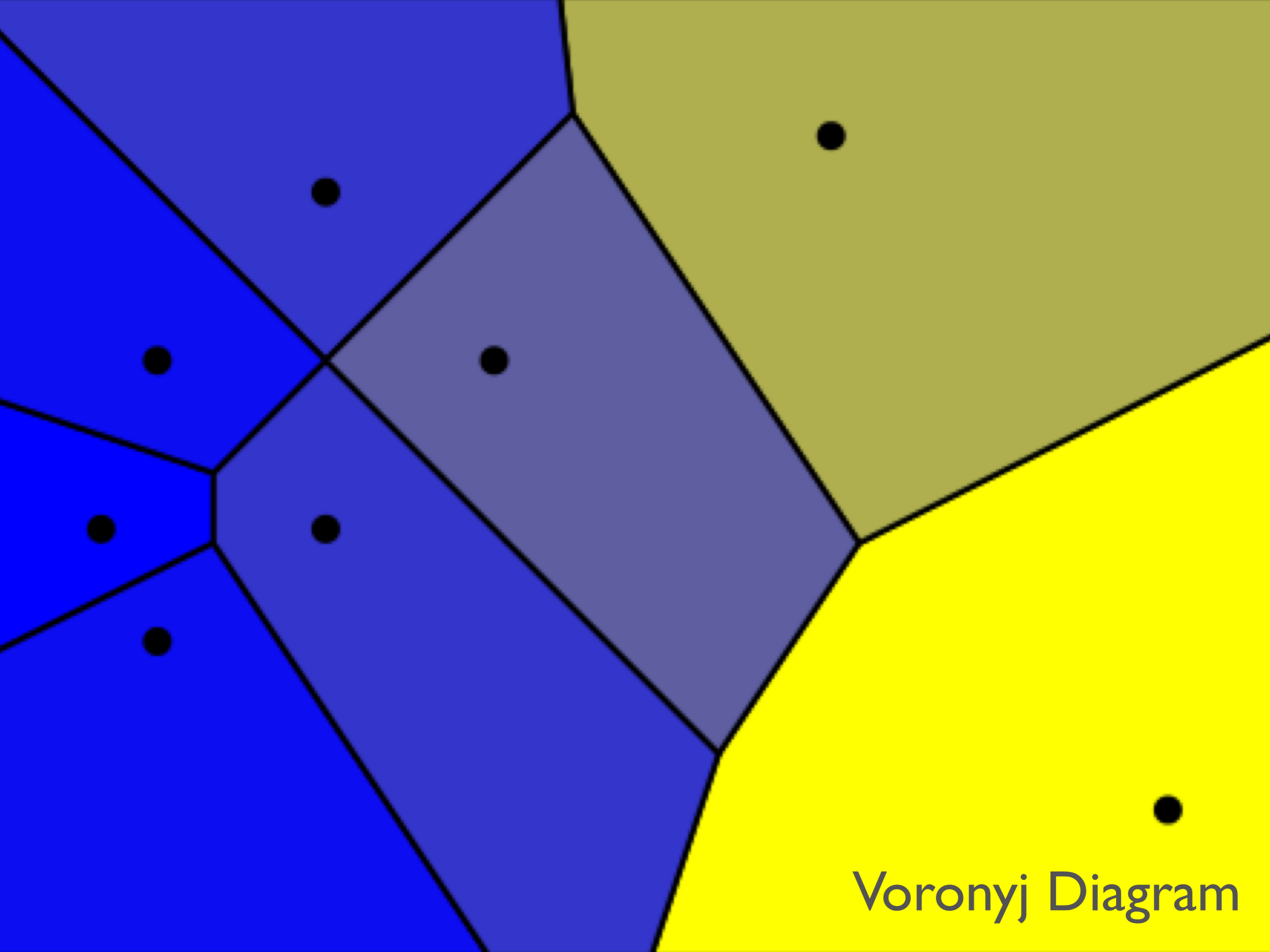
Barcelona



Paris

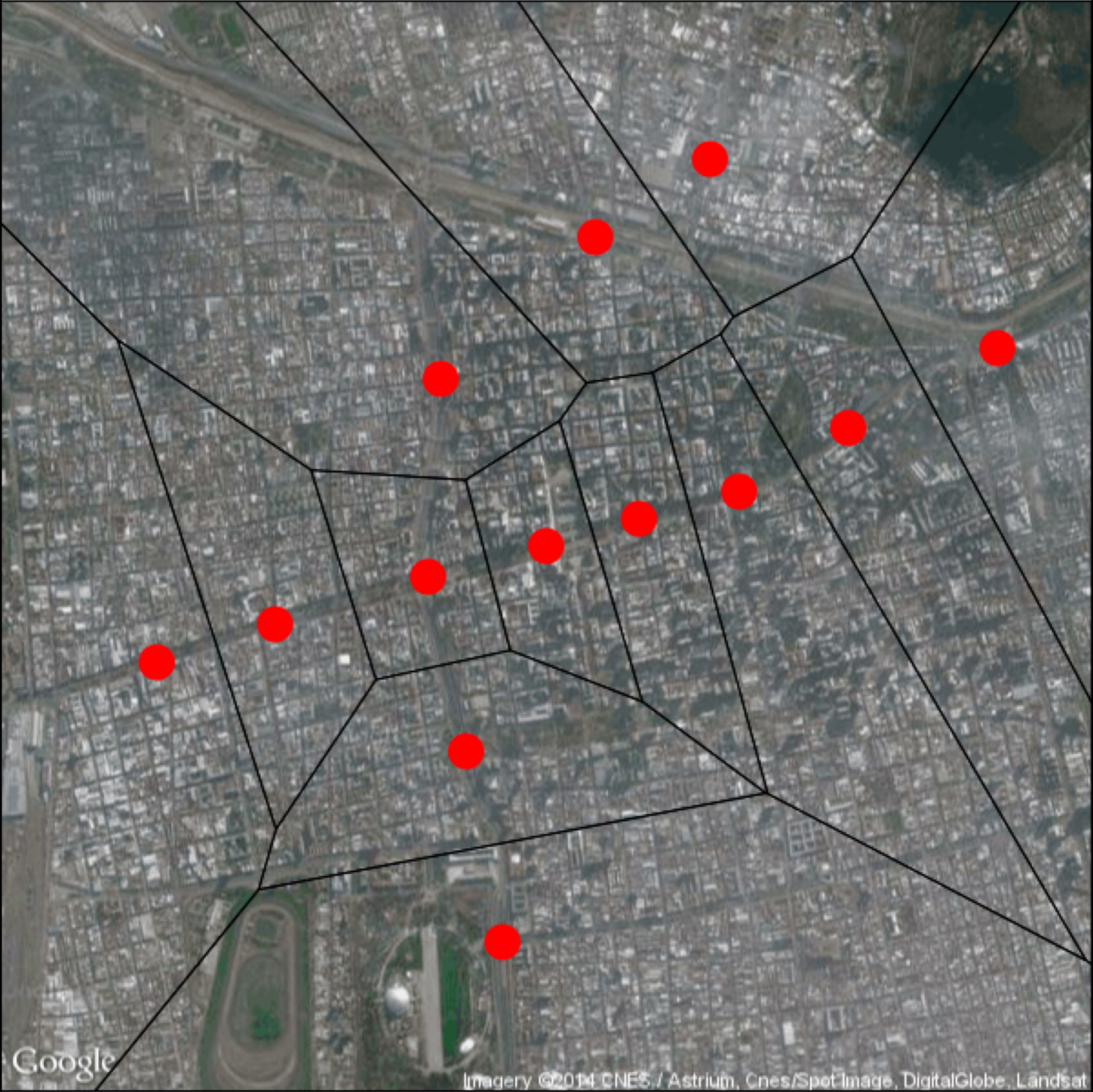


Lviv



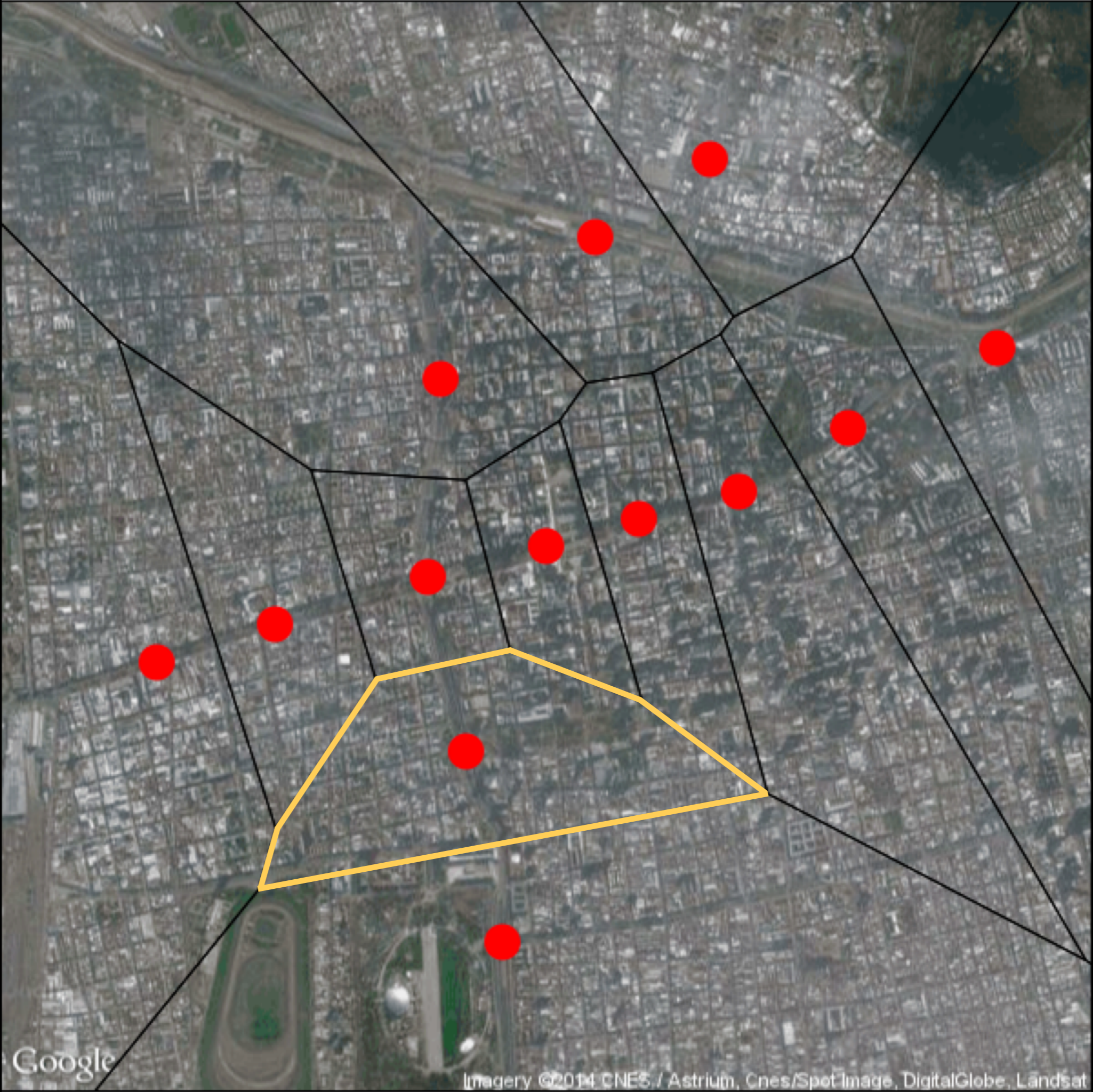
Voronyj Diagram

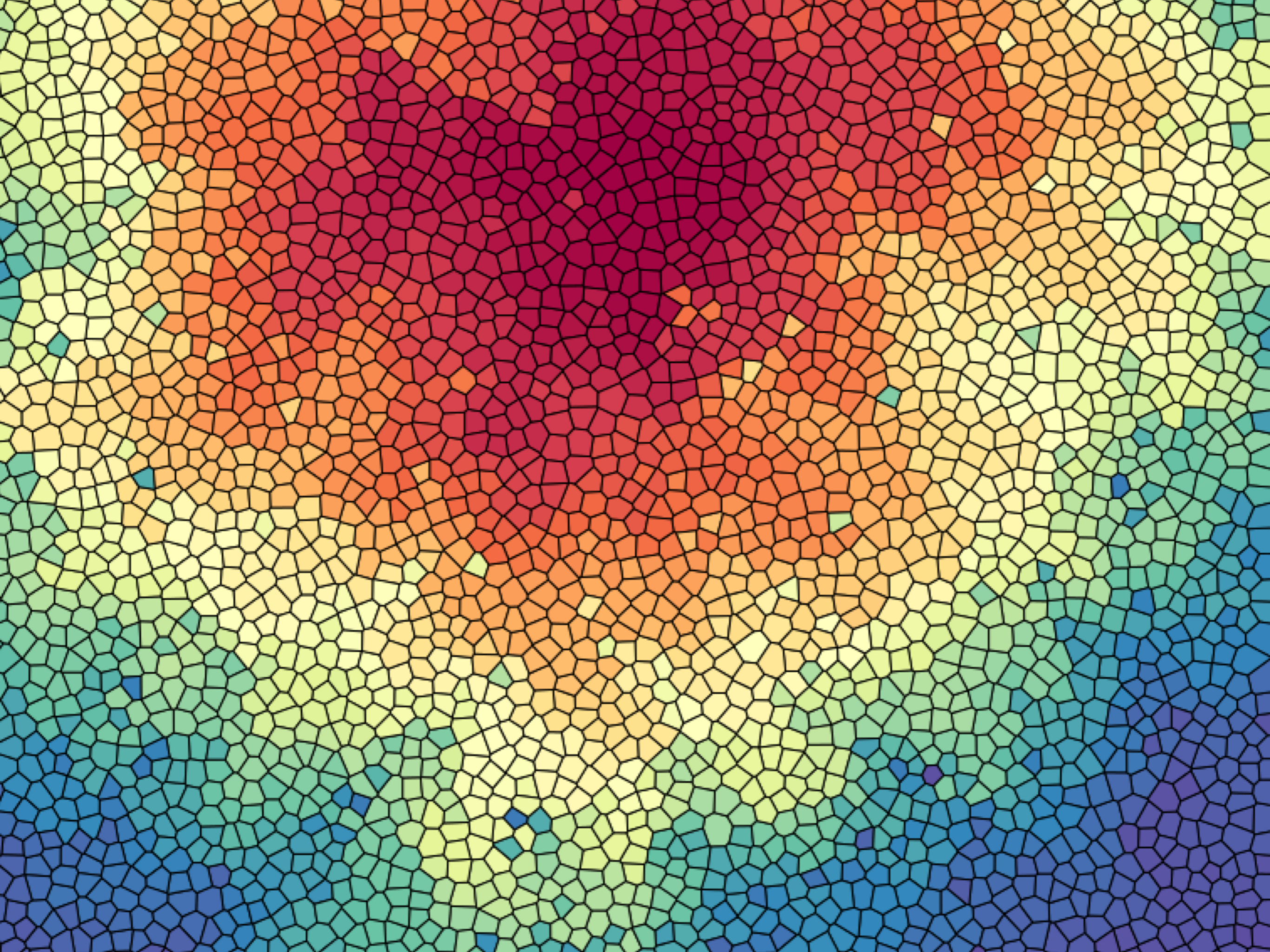


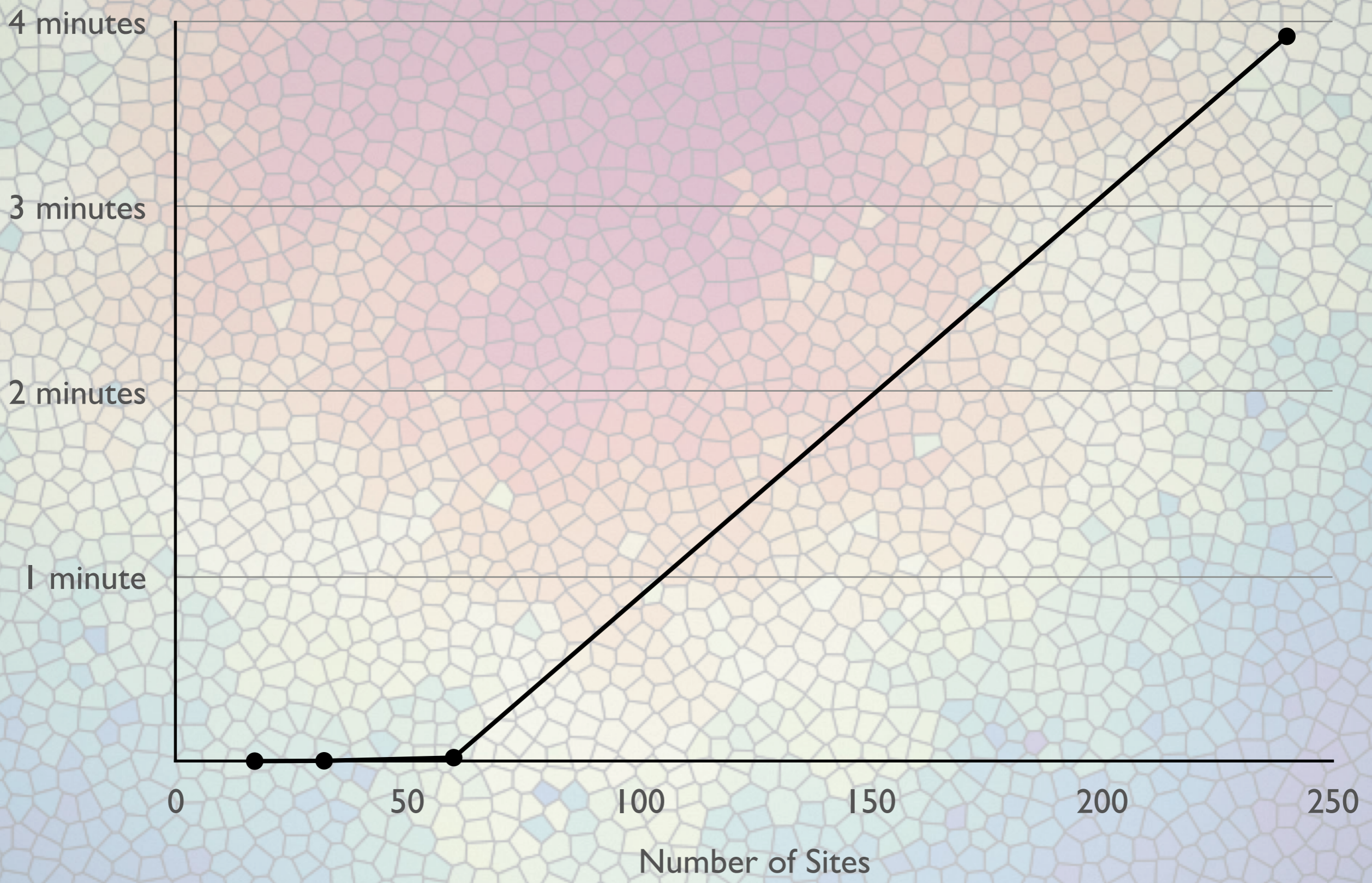


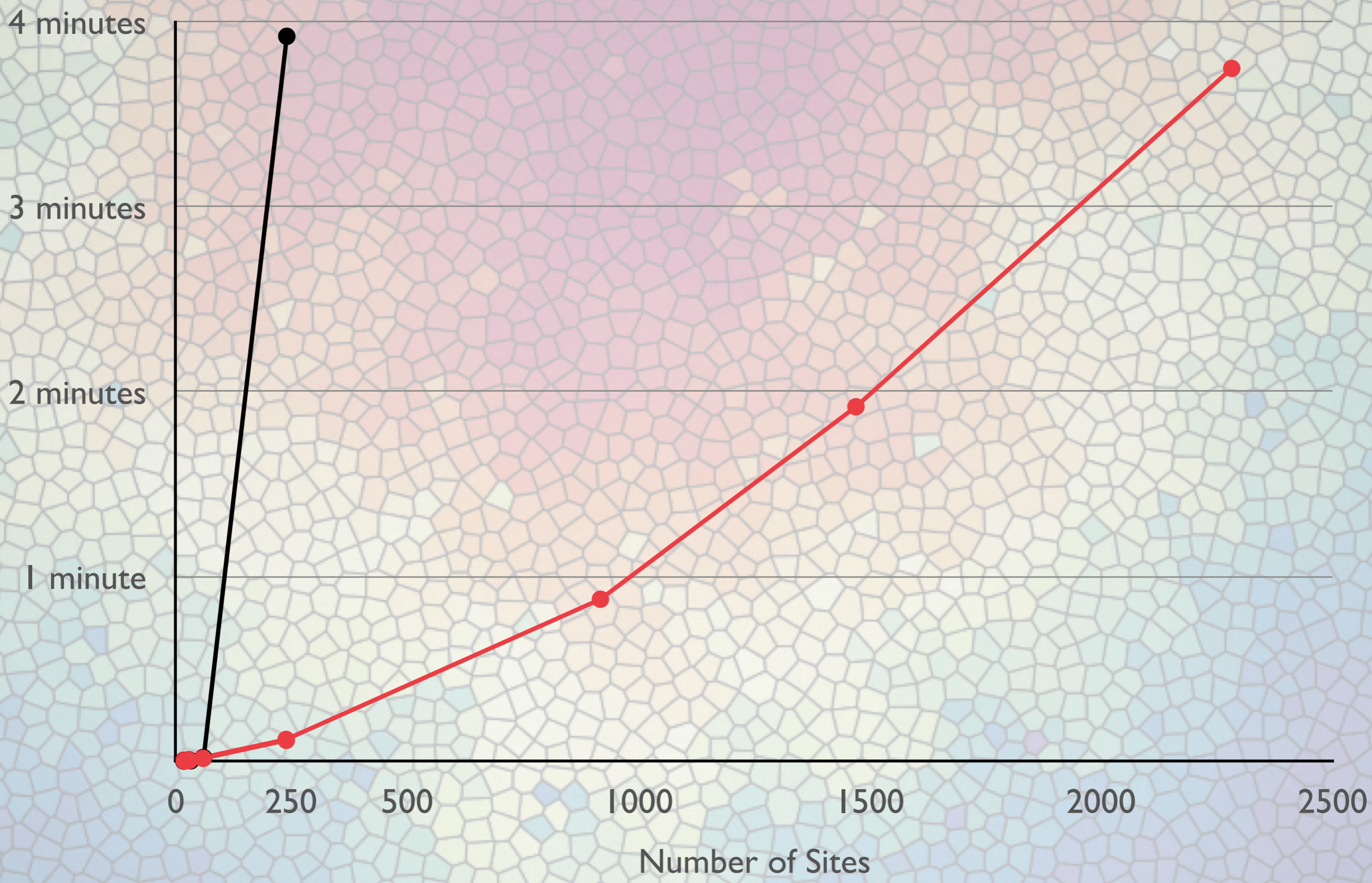
Google

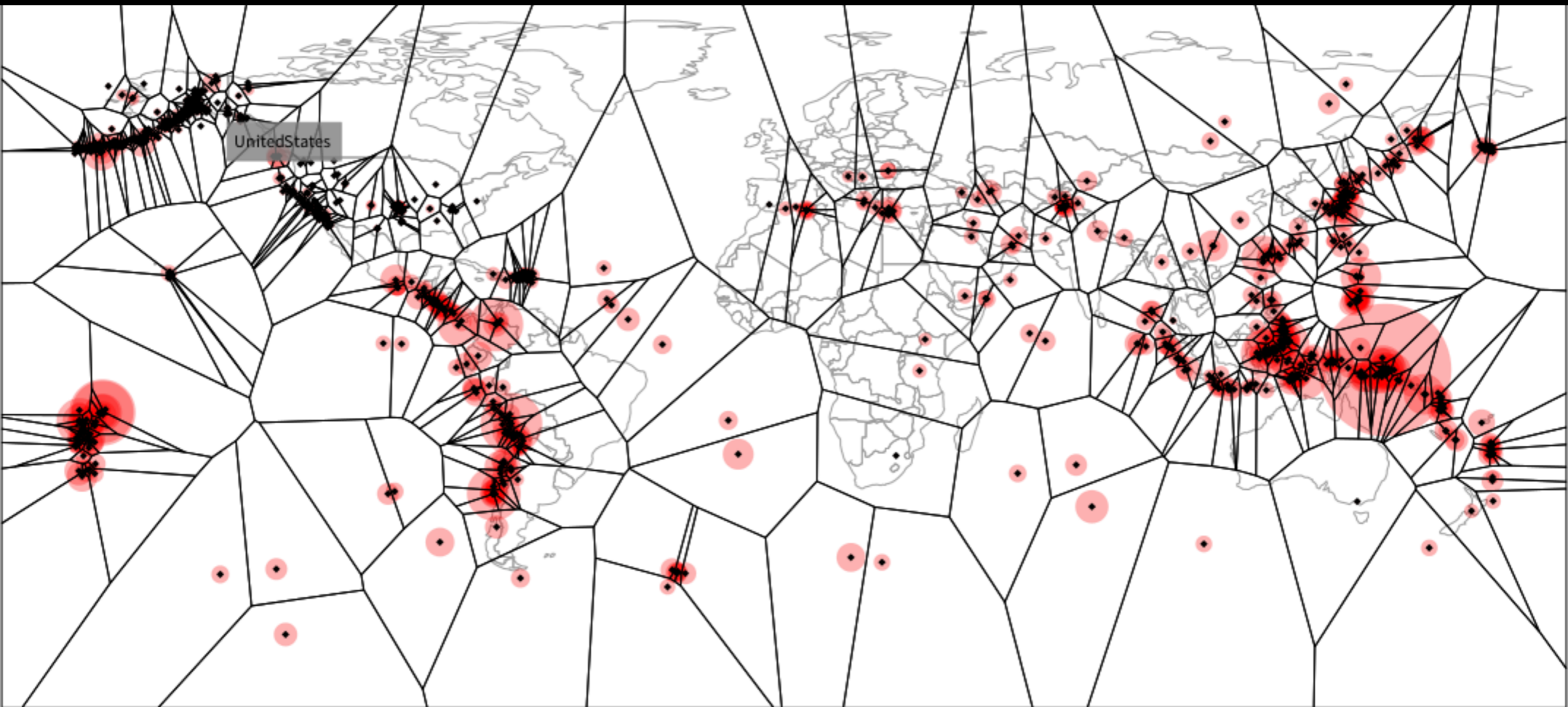
Imagery ©2014 CNES / Astrium, Cnes/Spot Image, DigitalGlobe, Landsat



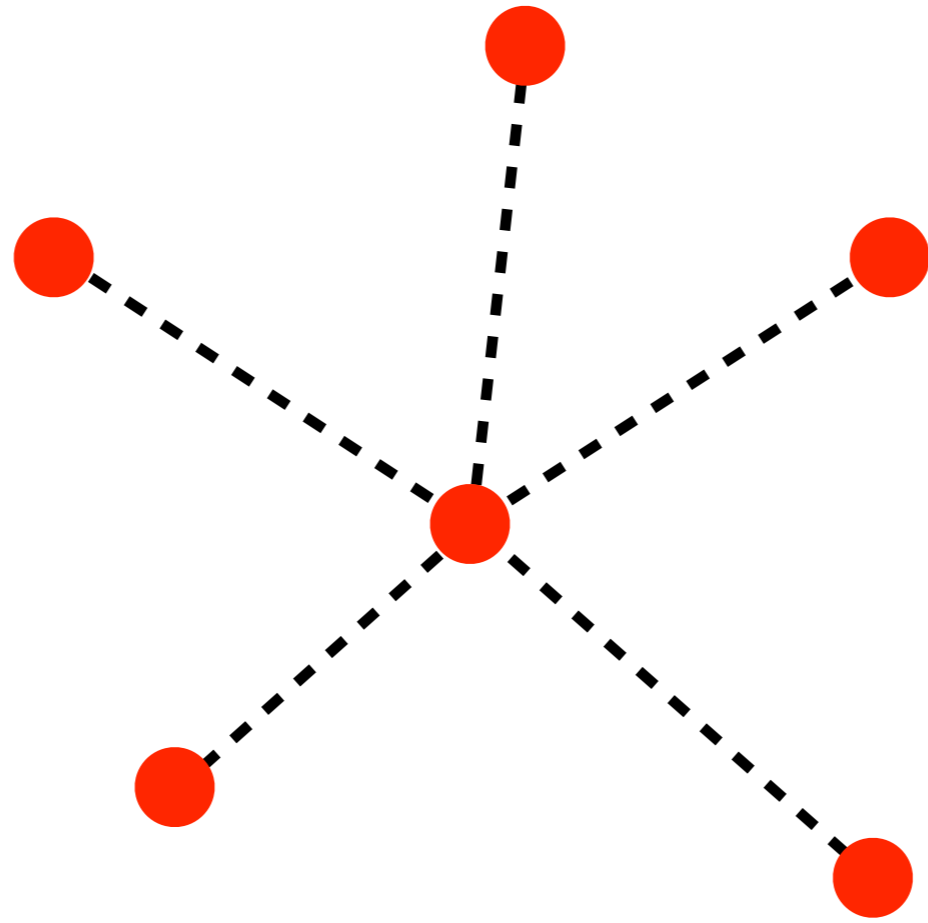


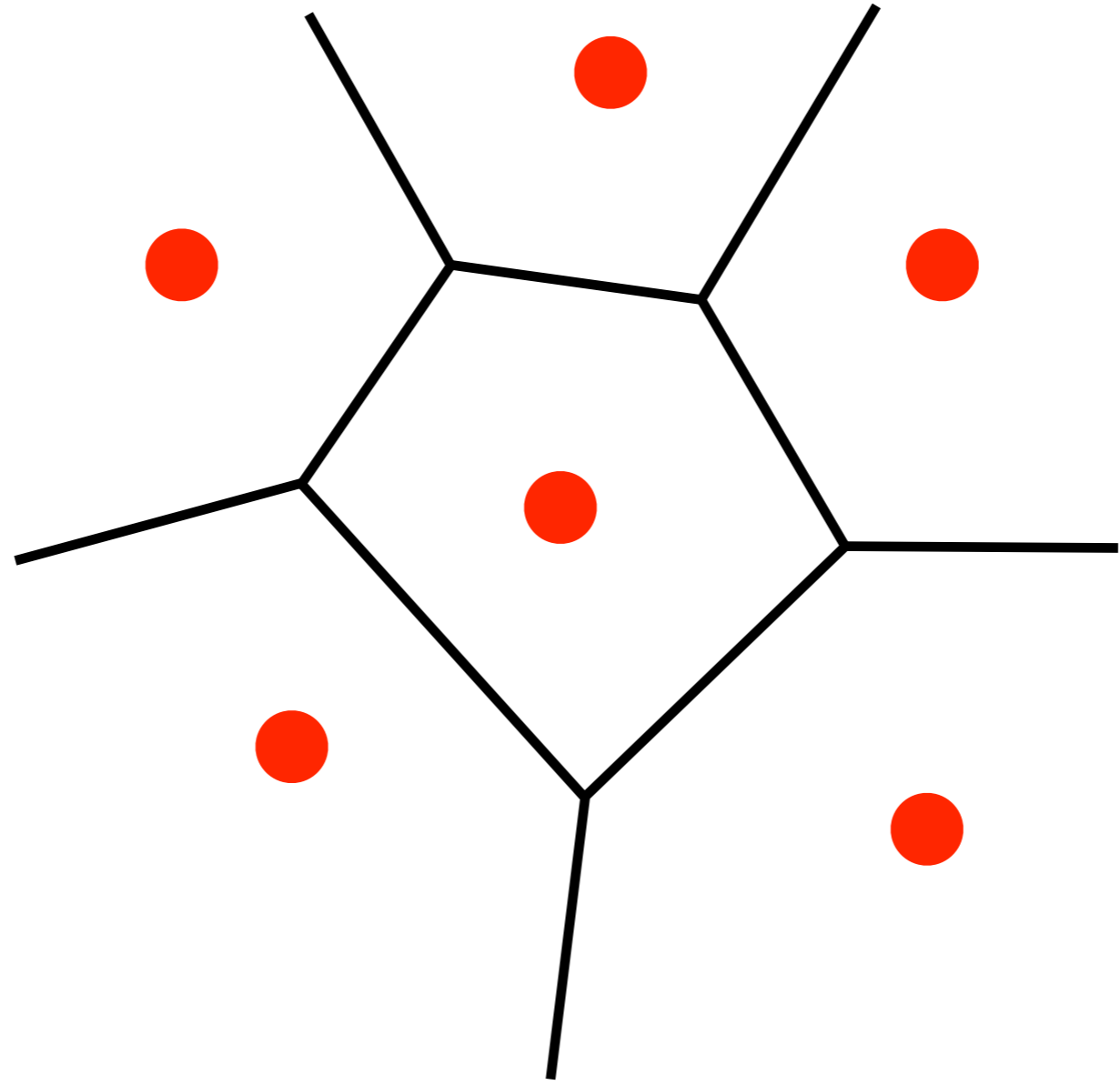












$(x,y)?$



$(x,y)?$



$(x,y)?$

$(x,y)?$



$(x,y)?$

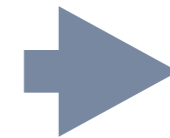
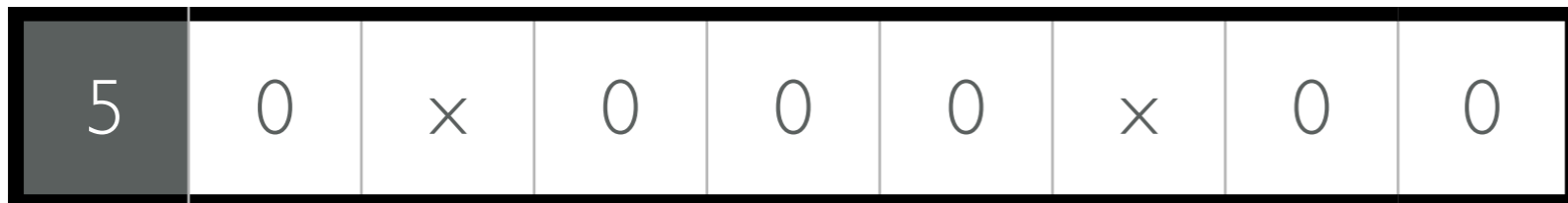


$(x,y)?$

	1	2	3	4	5	6	7	8
1				x				
2		x					x	
3	x					x		
4			x					
5		x				x		
6					x			
7		x						
8							x	

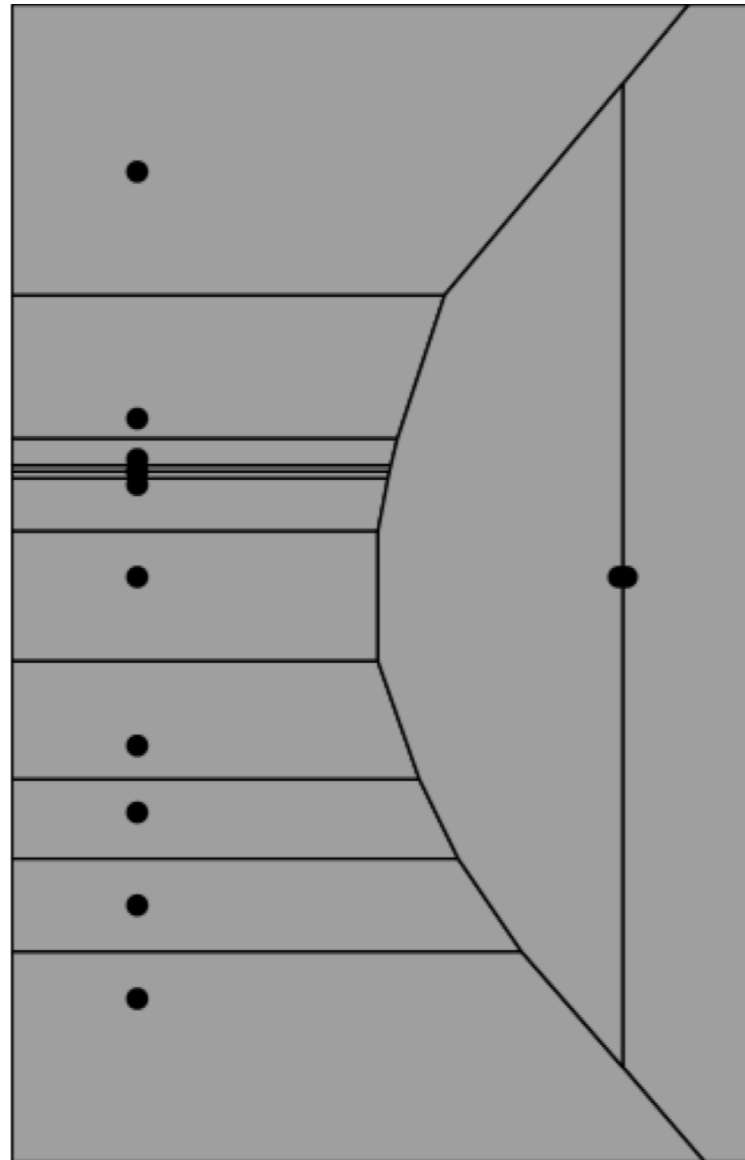
	1	2	3	4	5	6	7	8
1				x				
2		x					x	
3	x					x		
4			x					
5		x				x		
6					x			
7		x						
8							x	

5	0	x	0	0	0	x	0	0
---	---	---	---	---	---	---	---	---

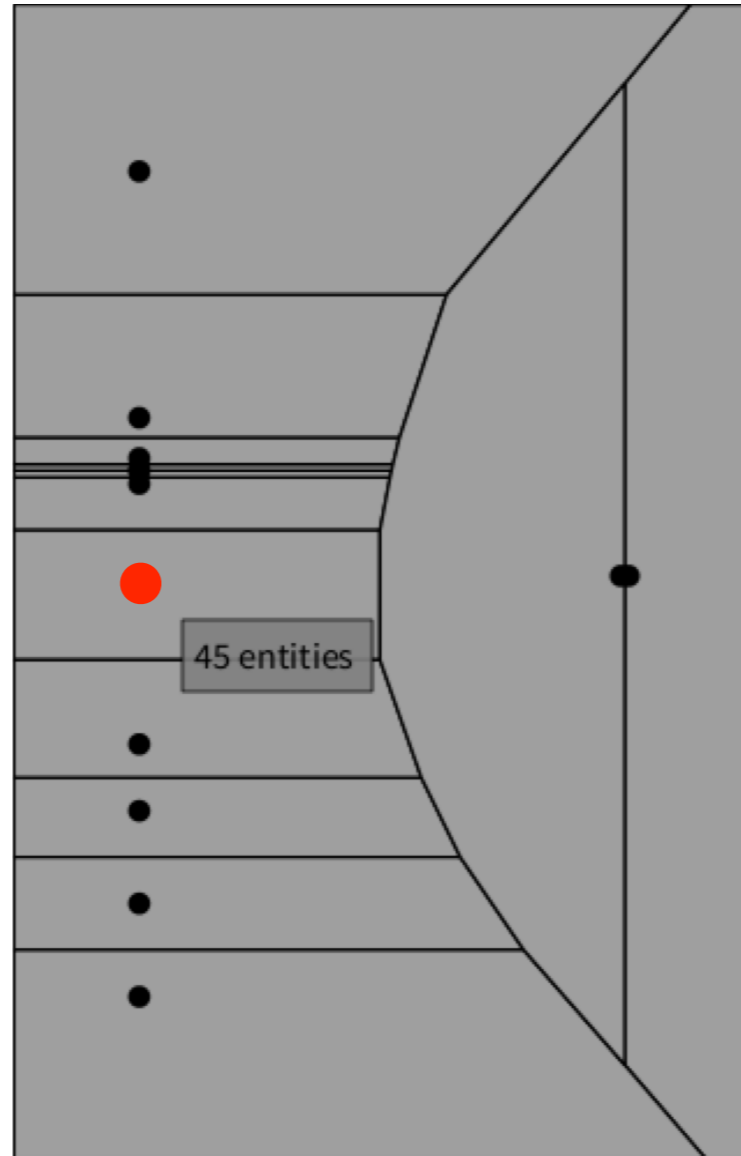


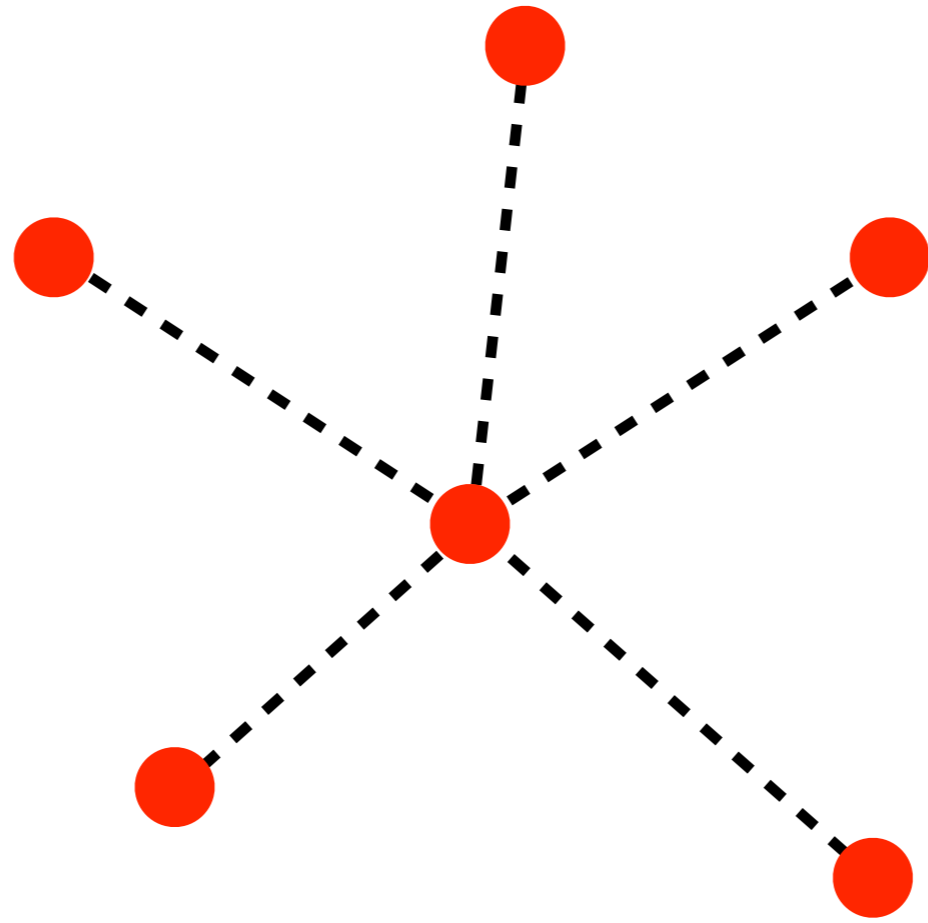
(a,b)

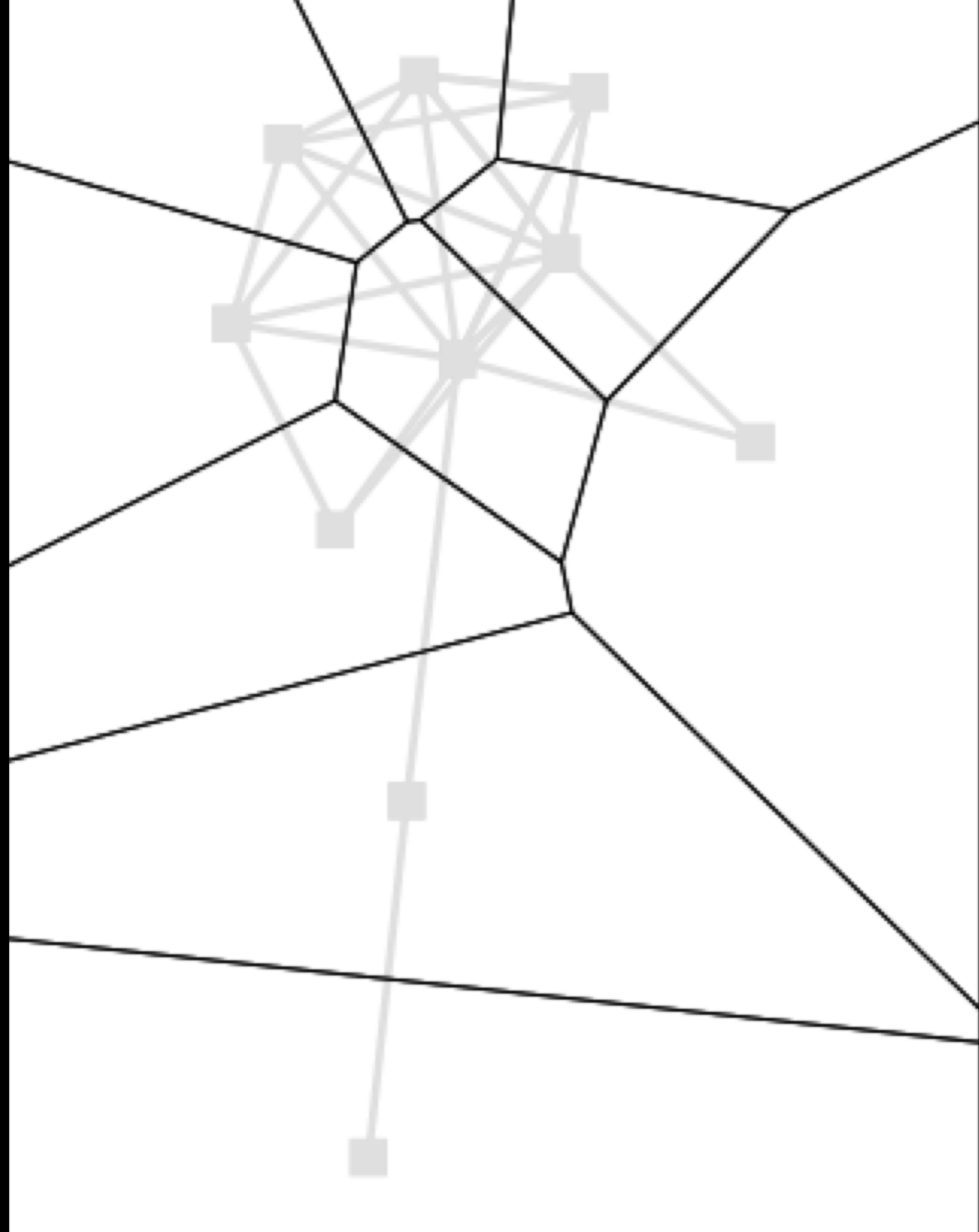
Multidimensional scaling



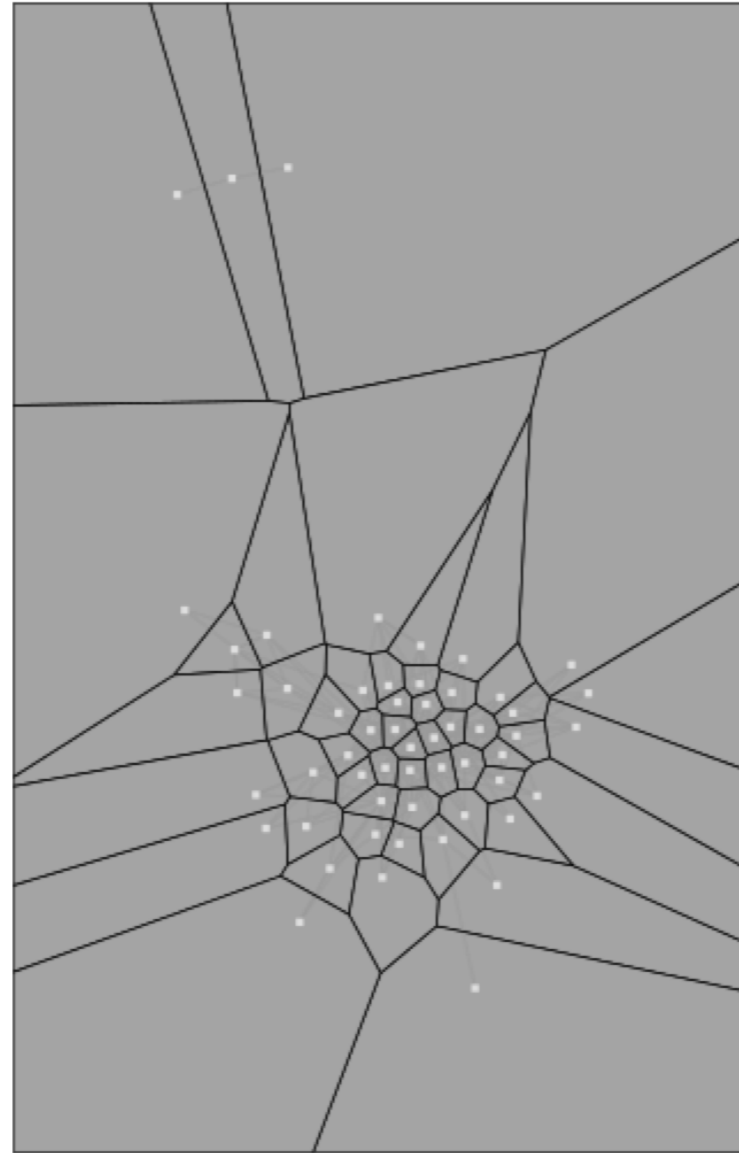
Multidimensional scaling



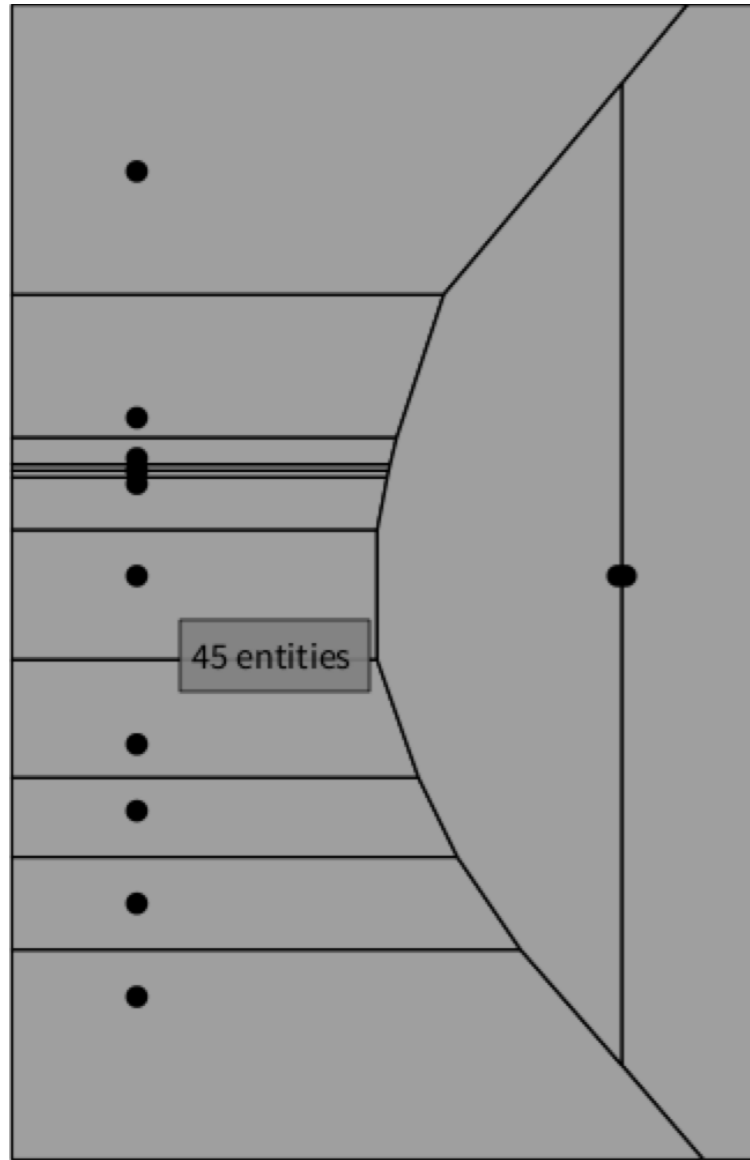




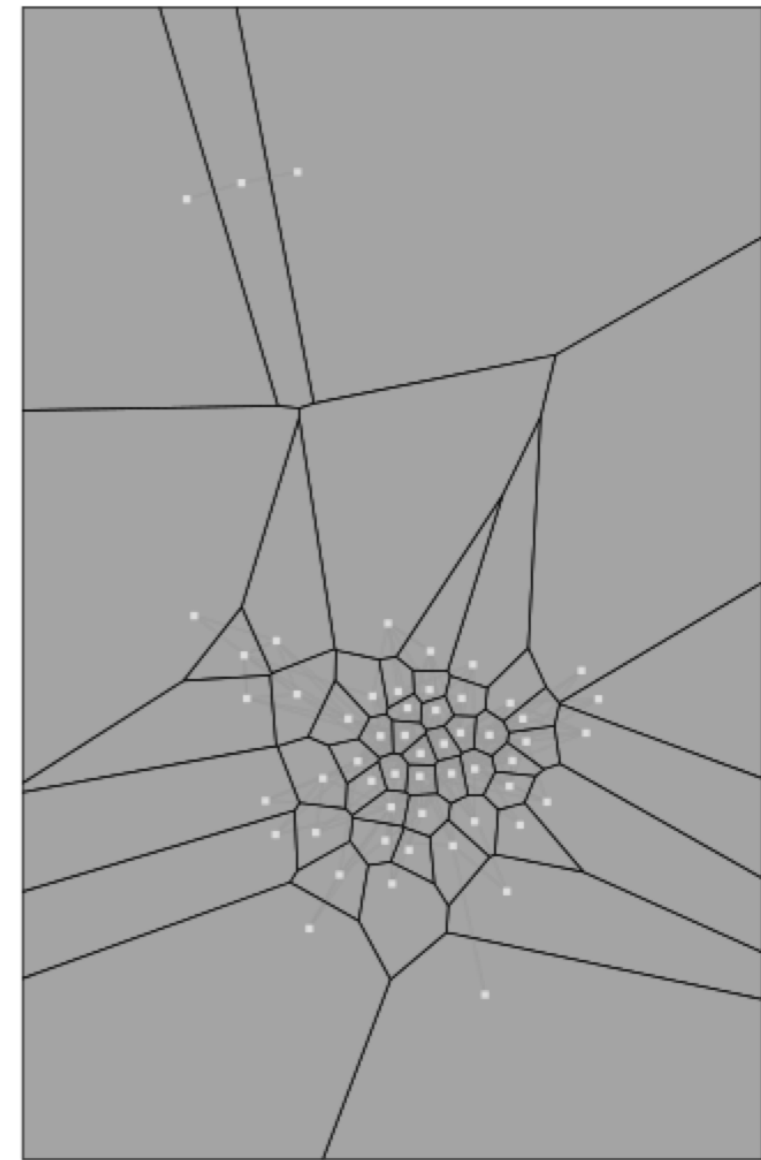
Force based layout



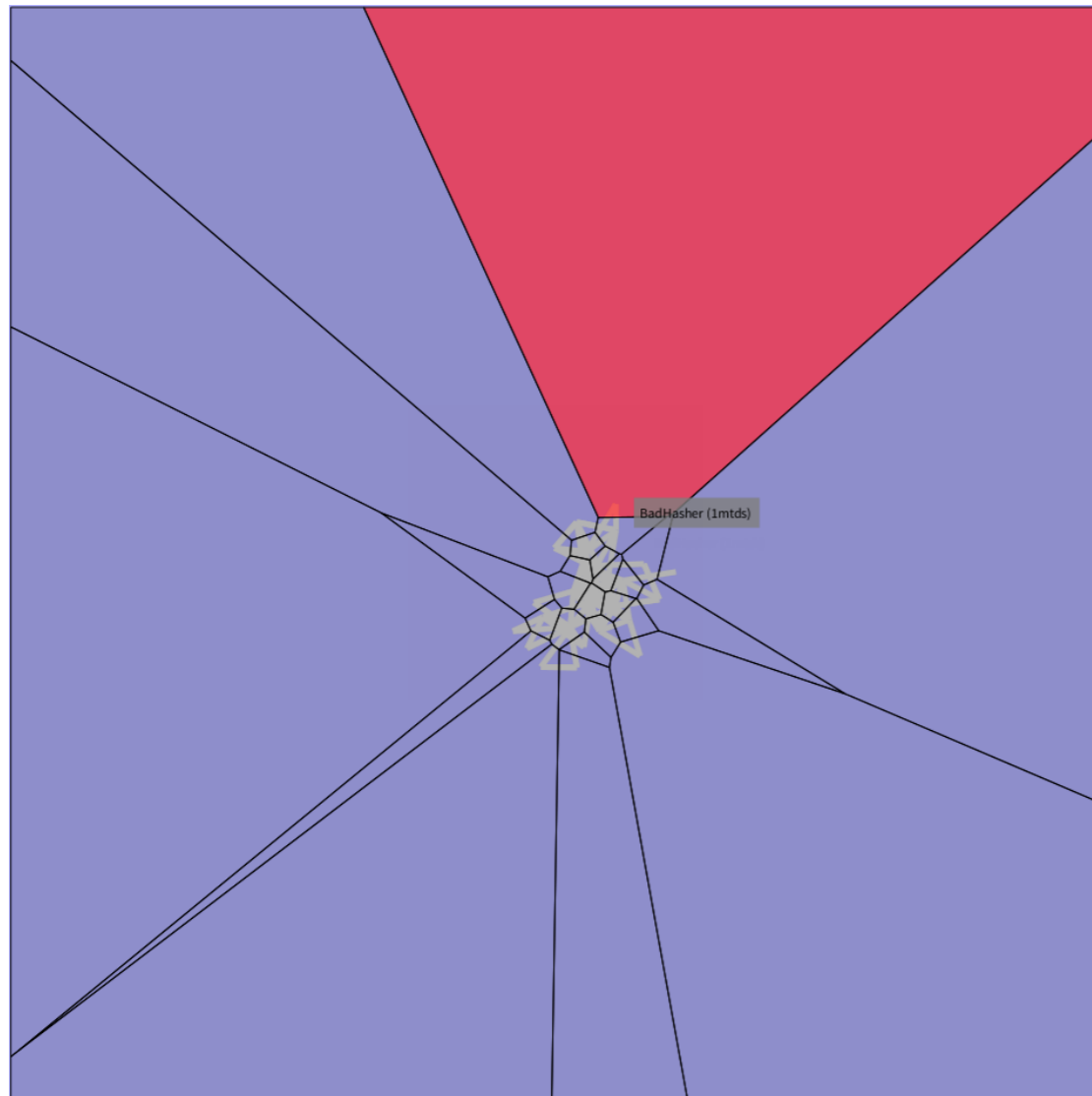
Multidimensional scaling



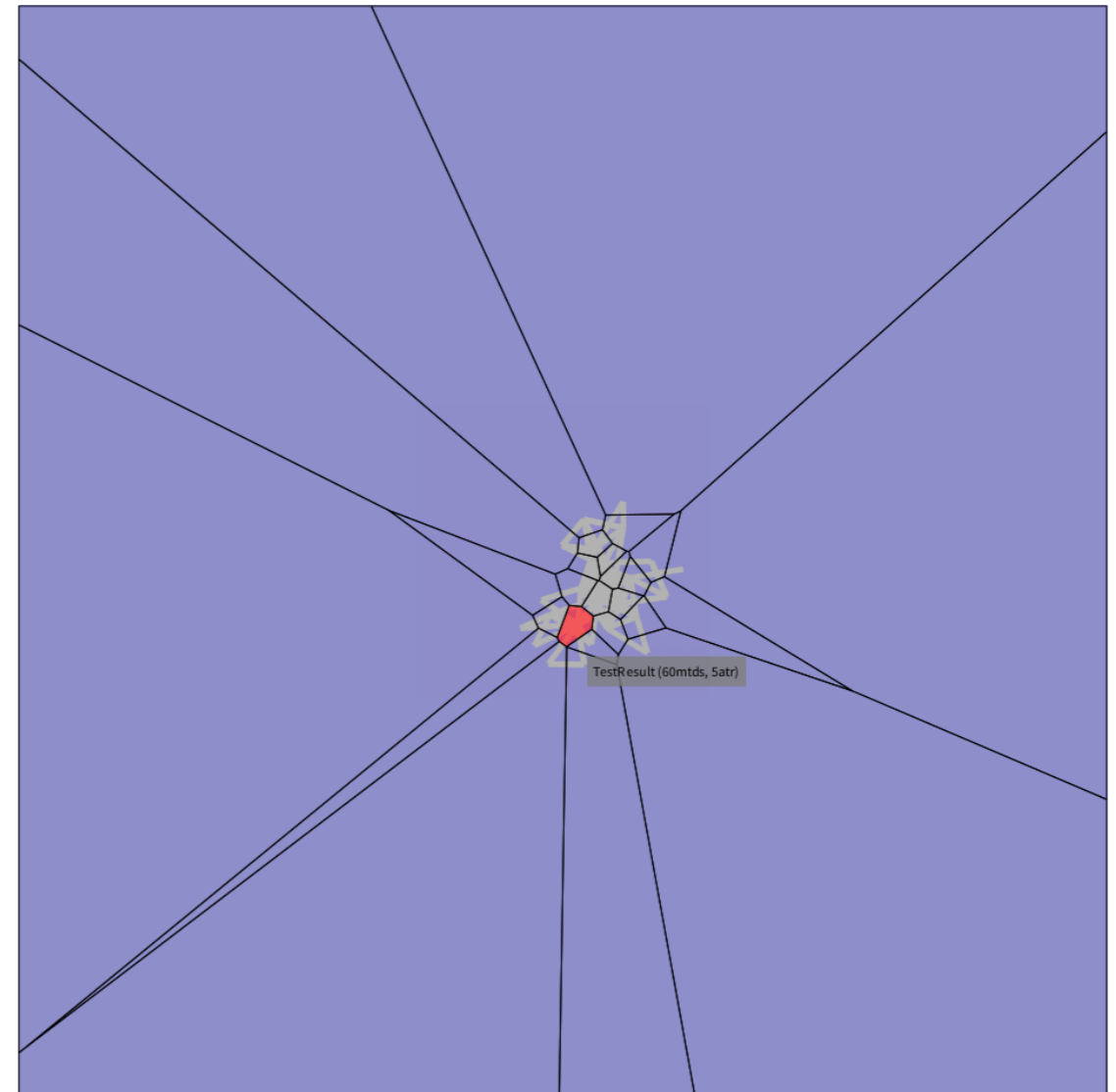
Force based layout



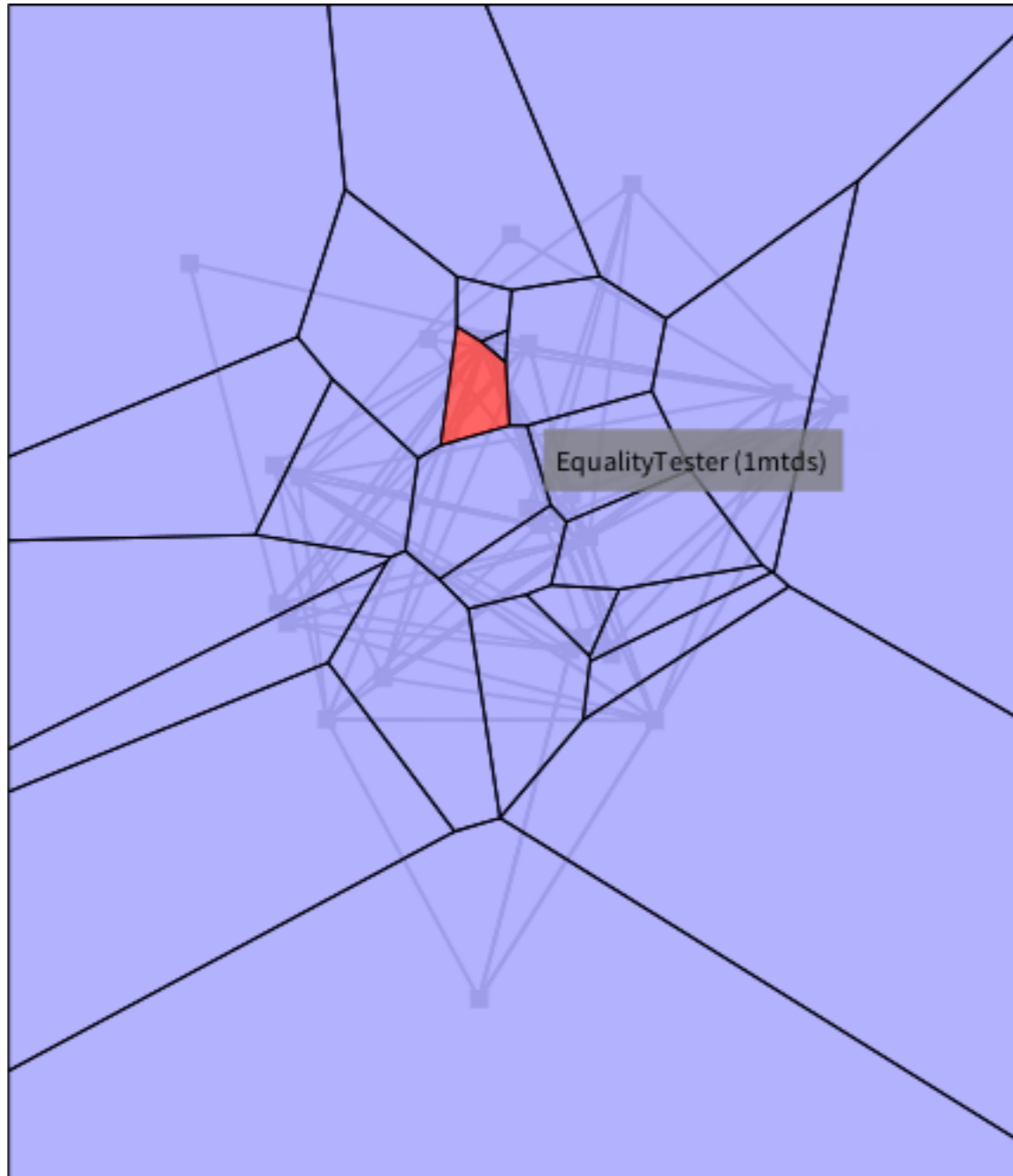
1 method



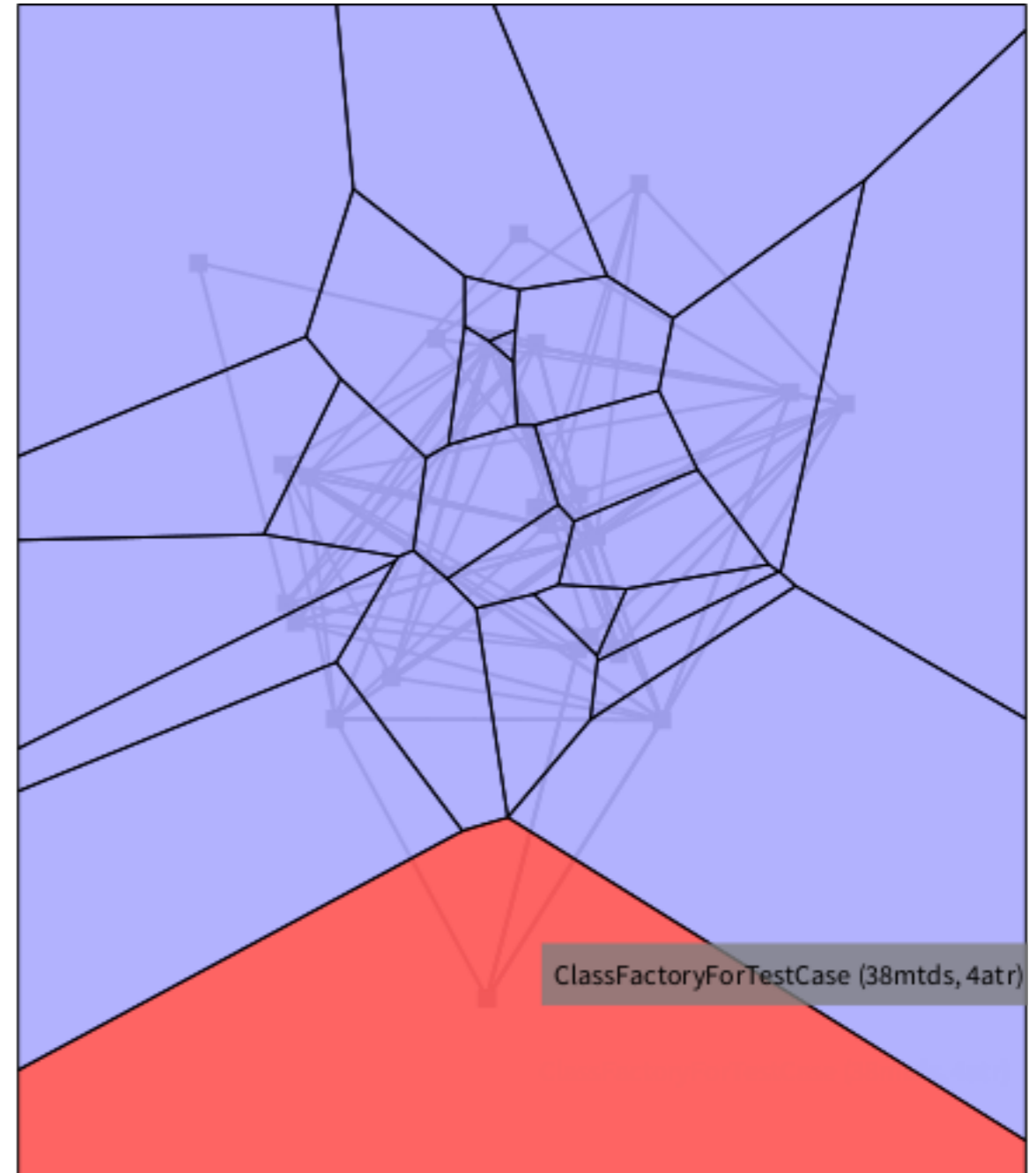
60 methods

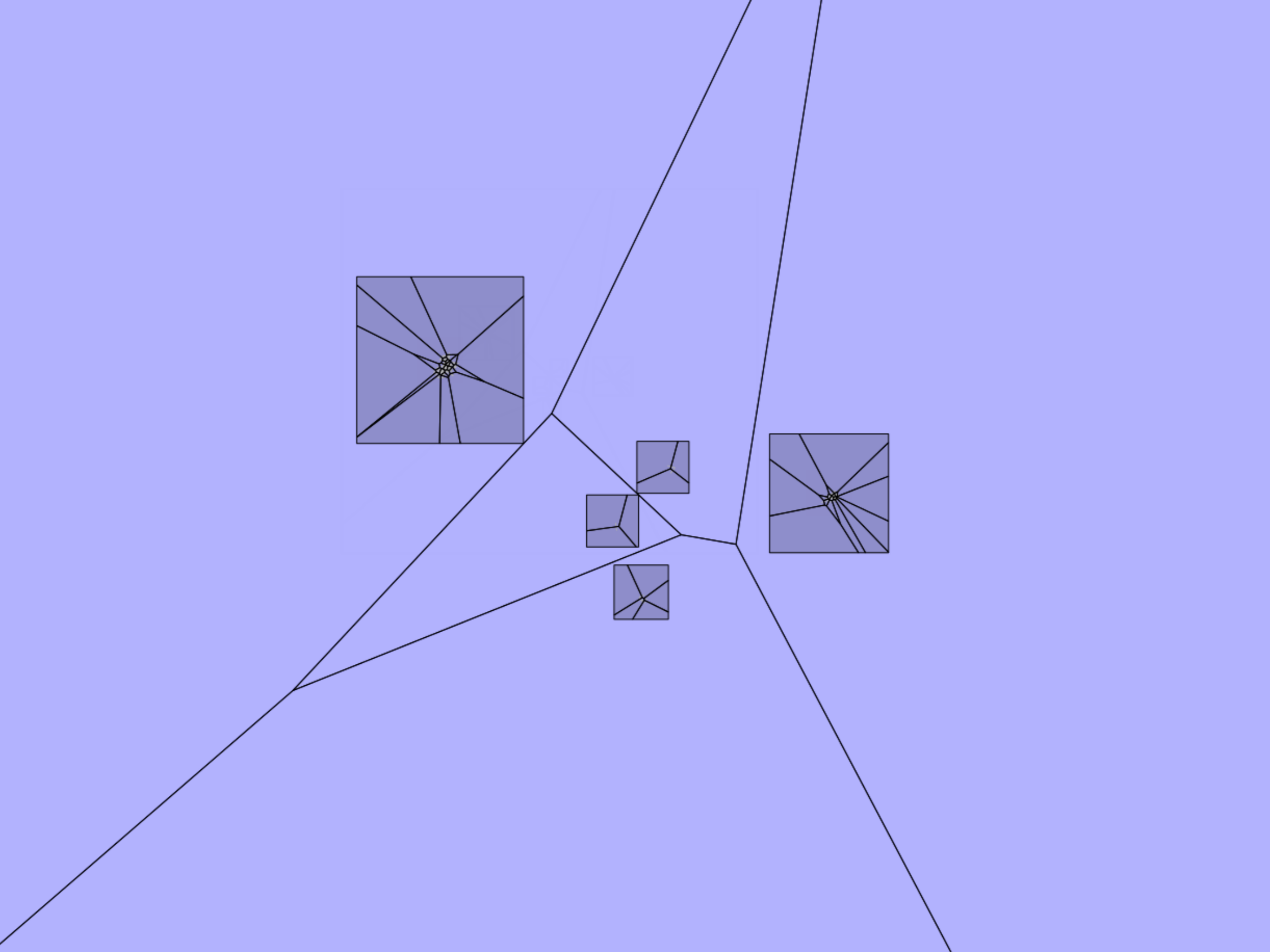


1 method

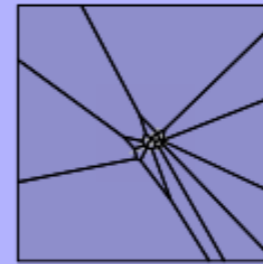
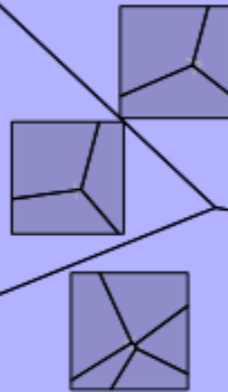
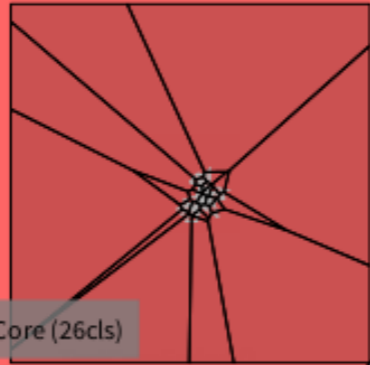


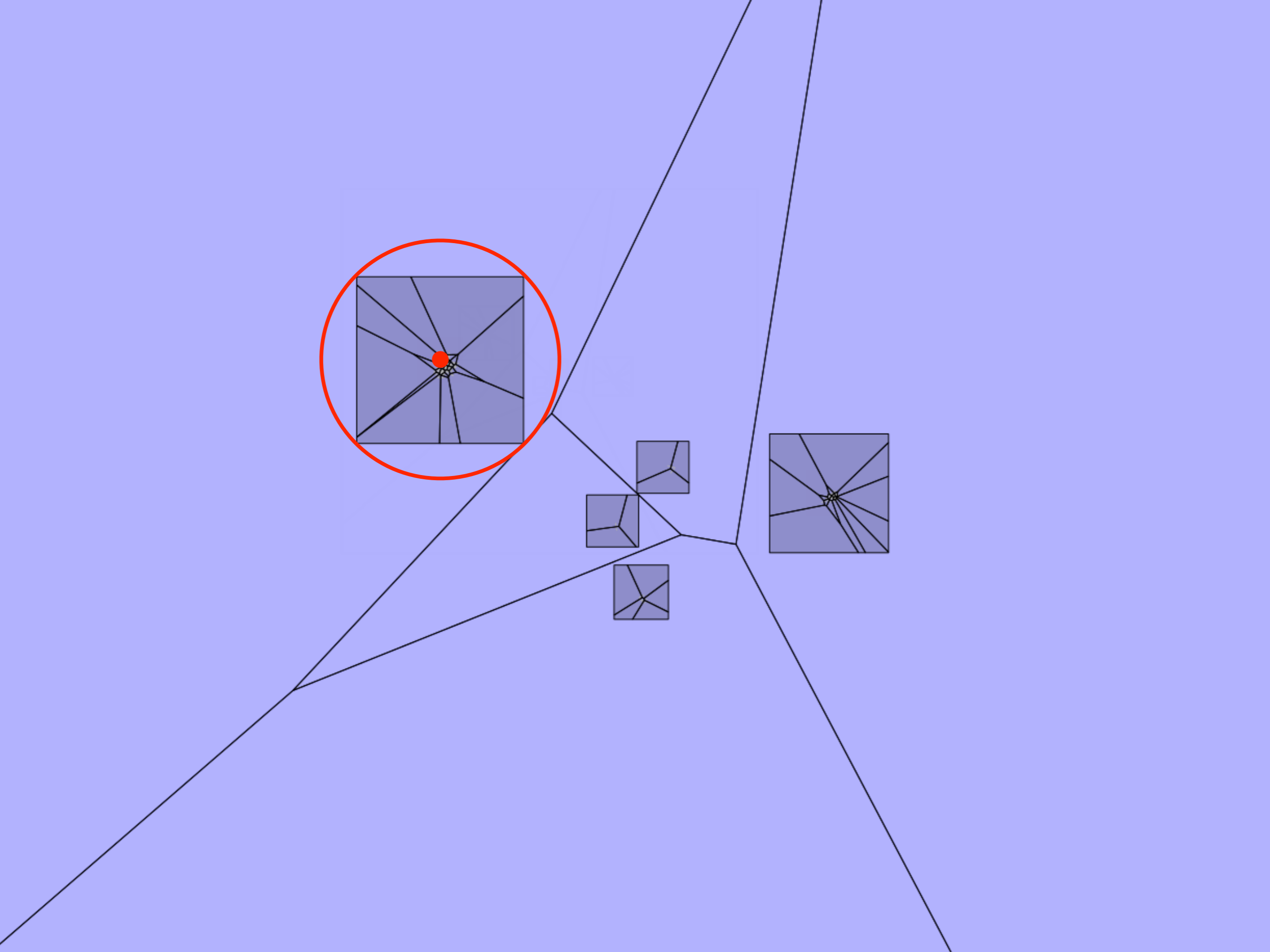
38 methods

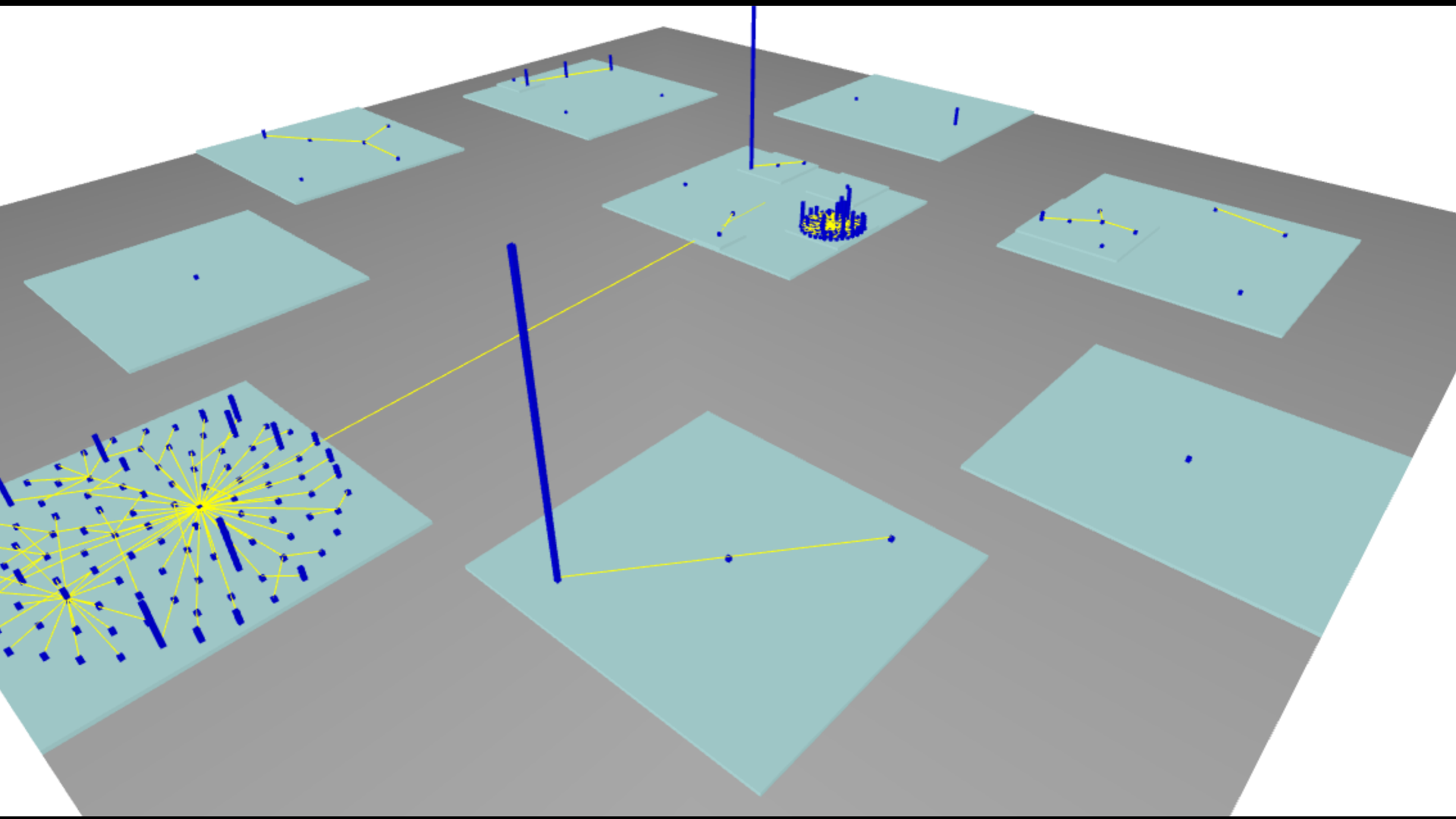


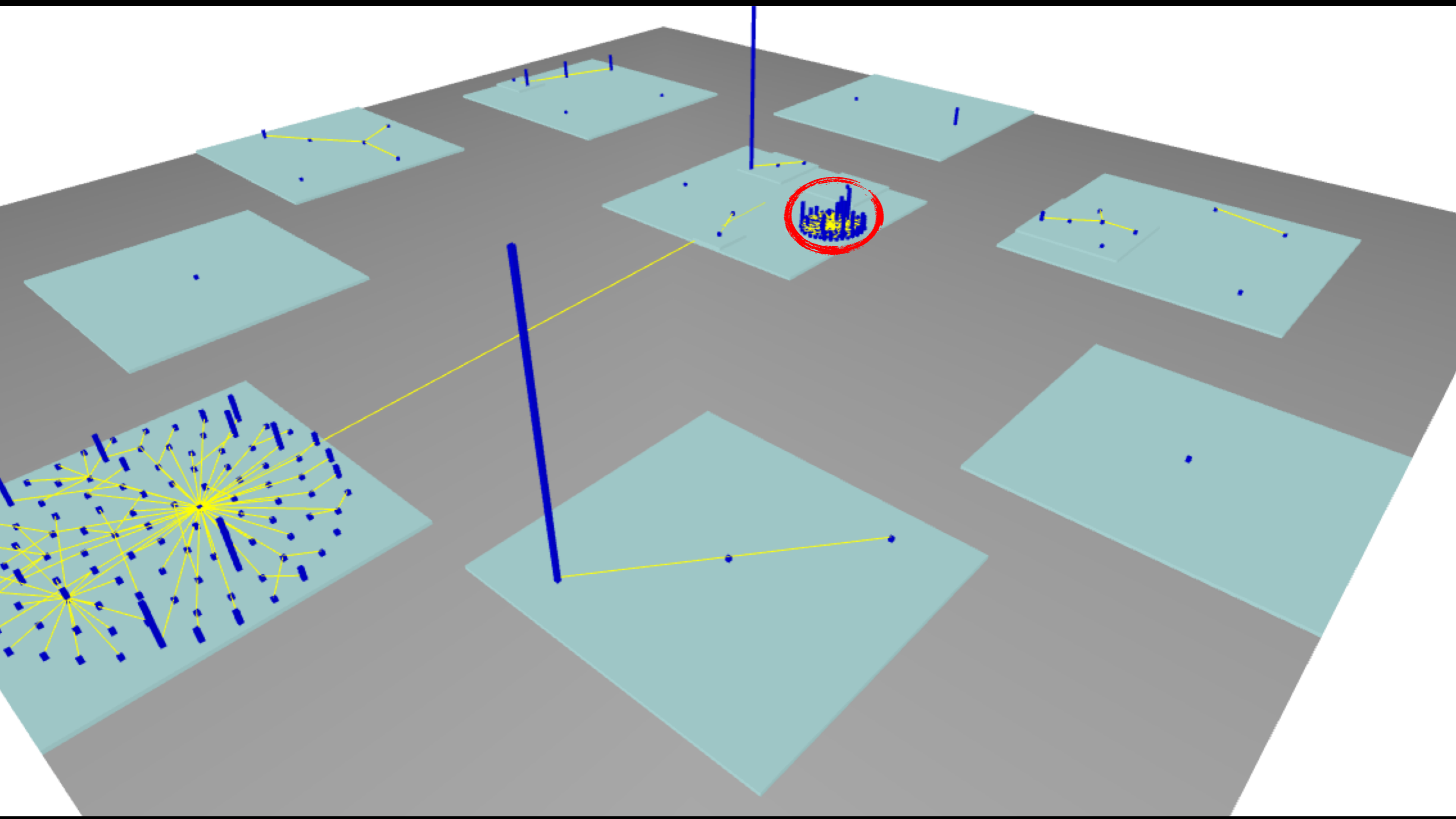


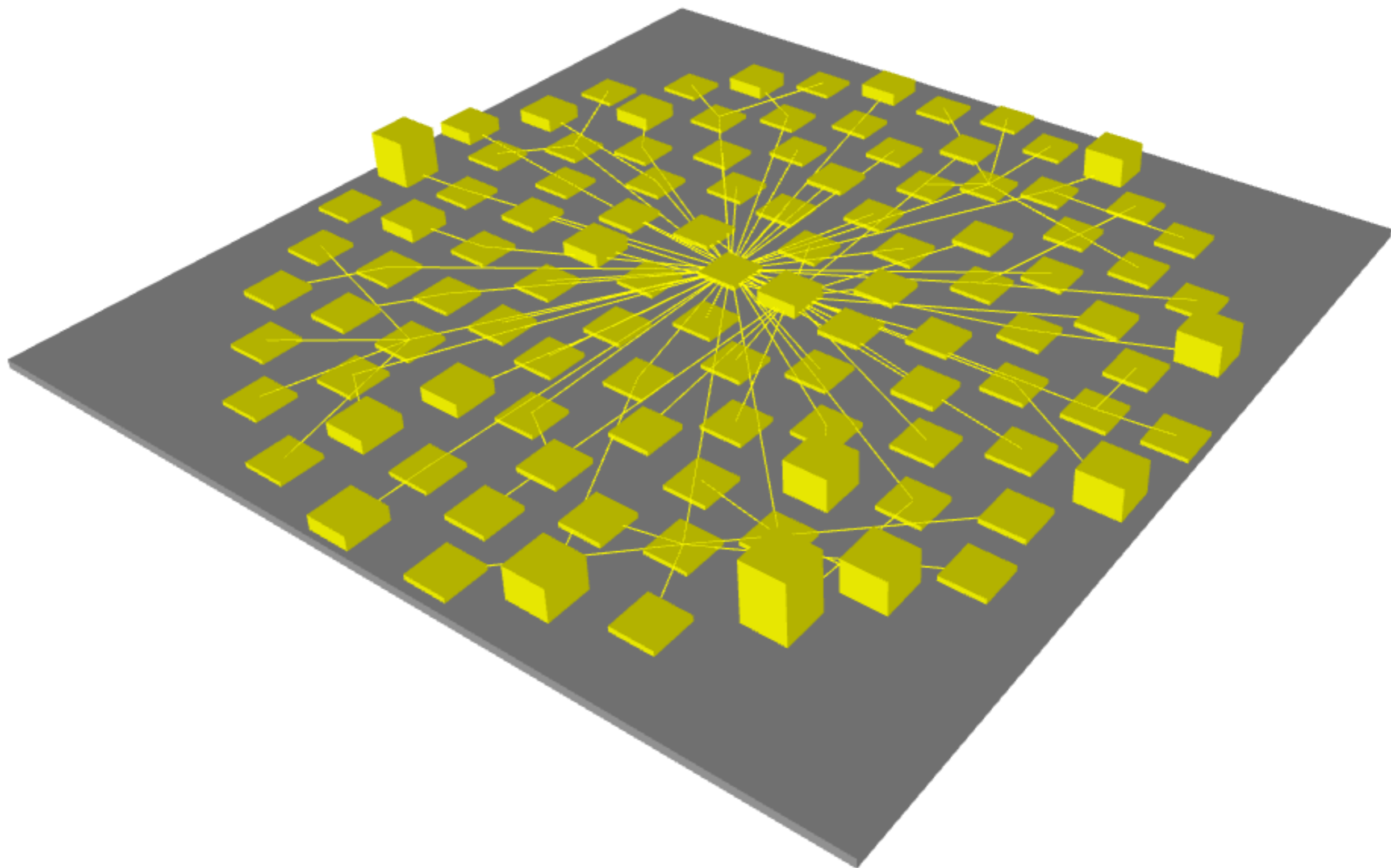
SUnit-Core (26cls)

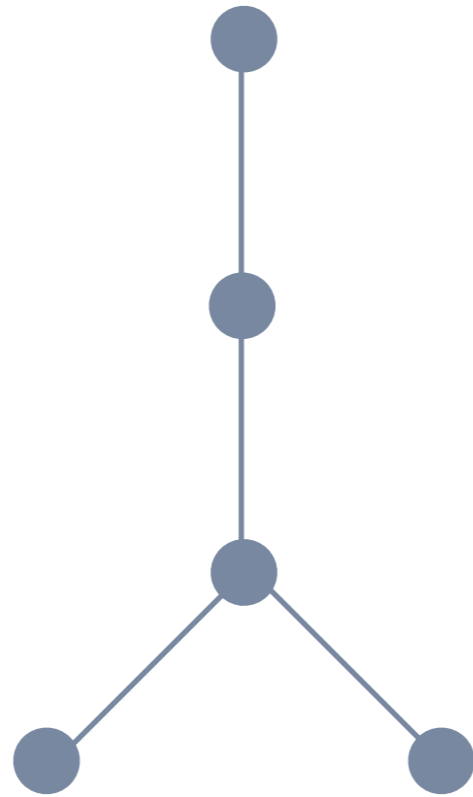


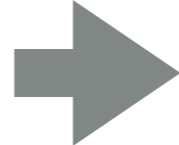
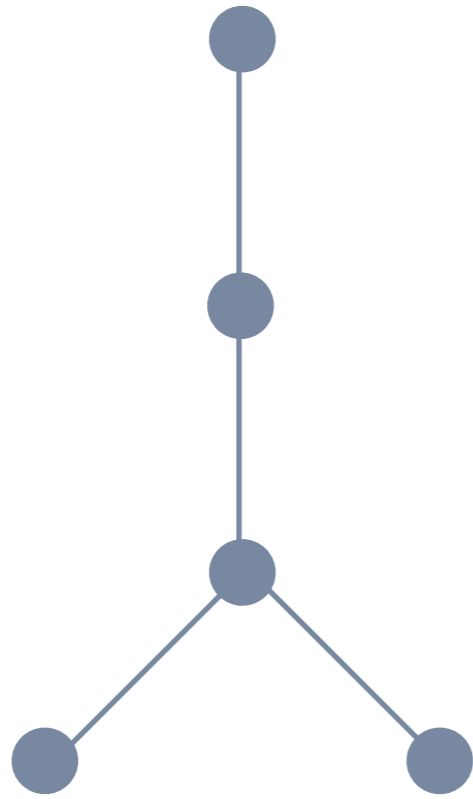




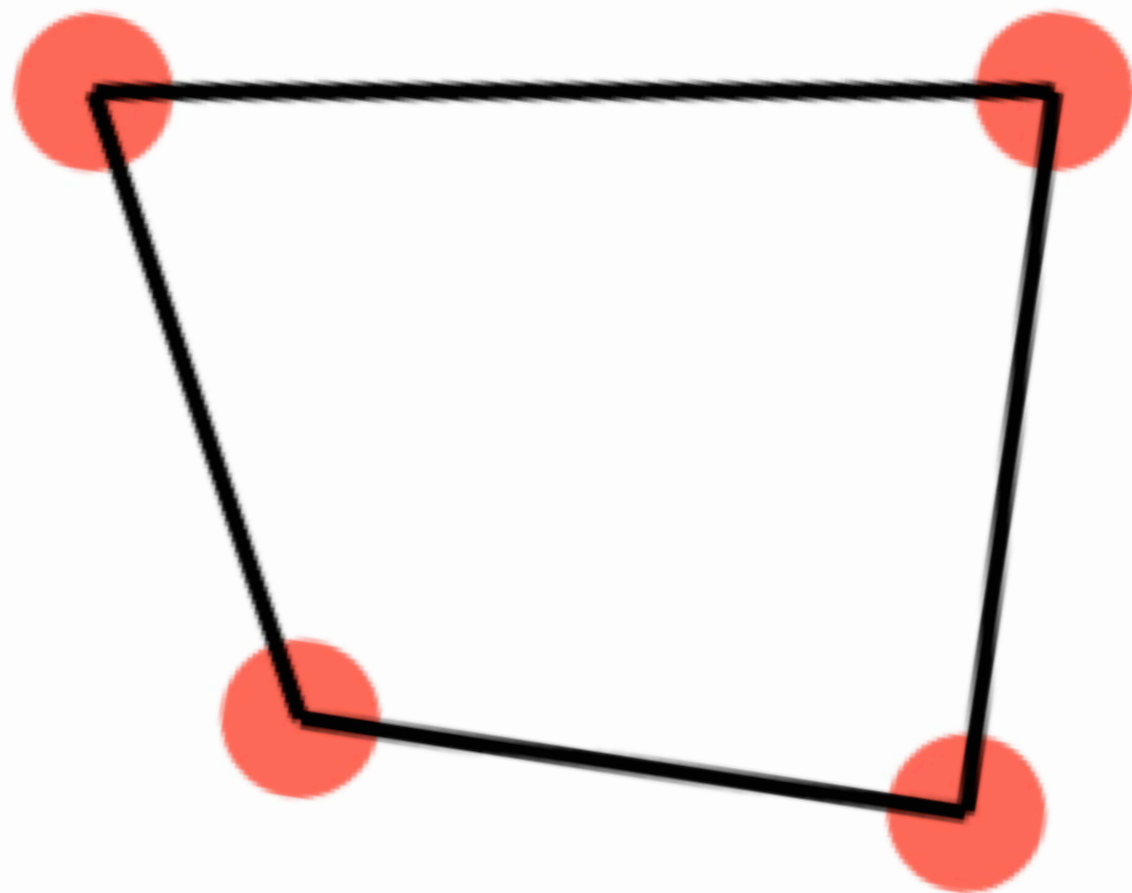




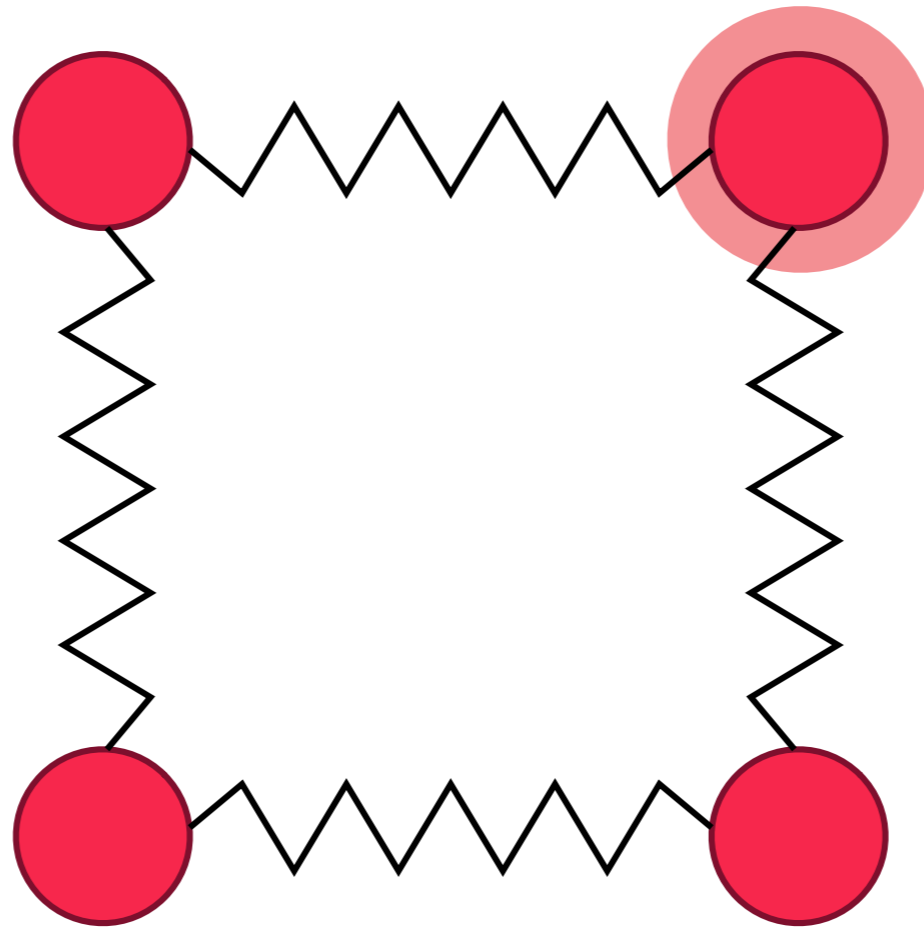




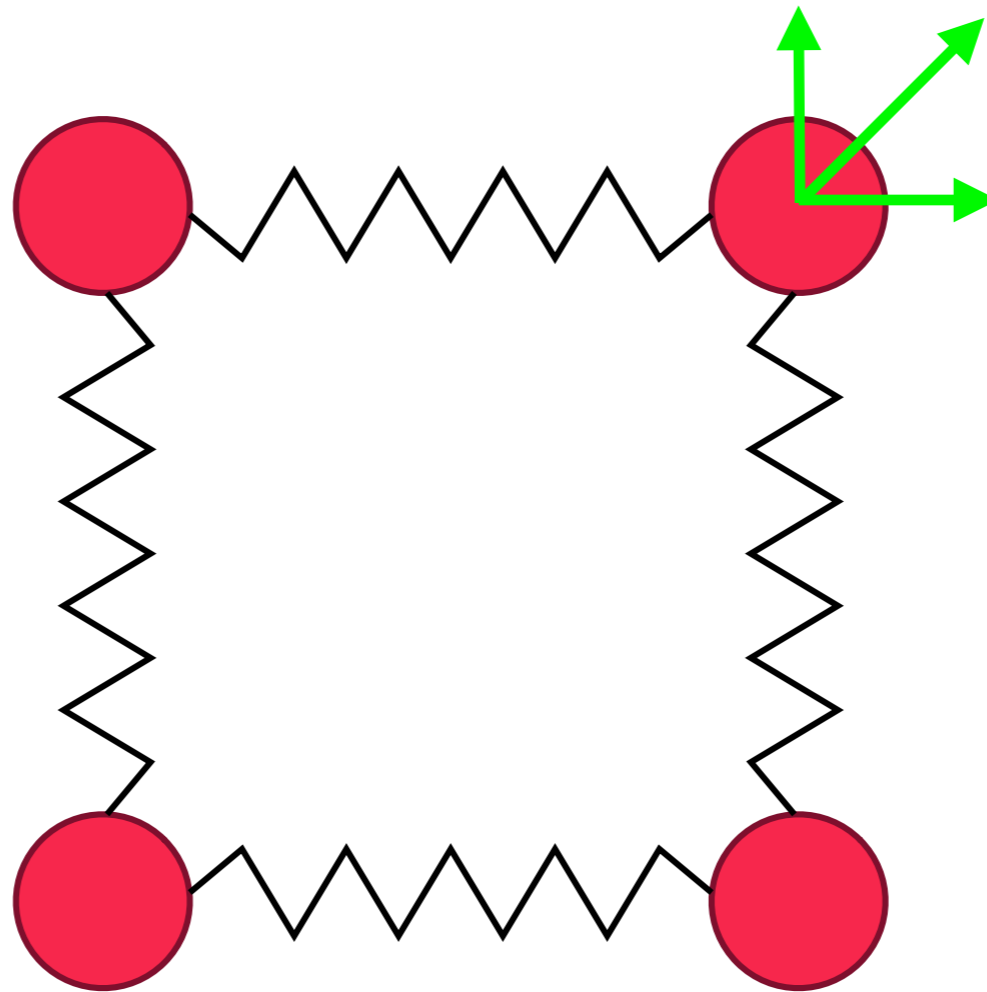
- Distance, position;
- Different features for software entities;
- Graph model;



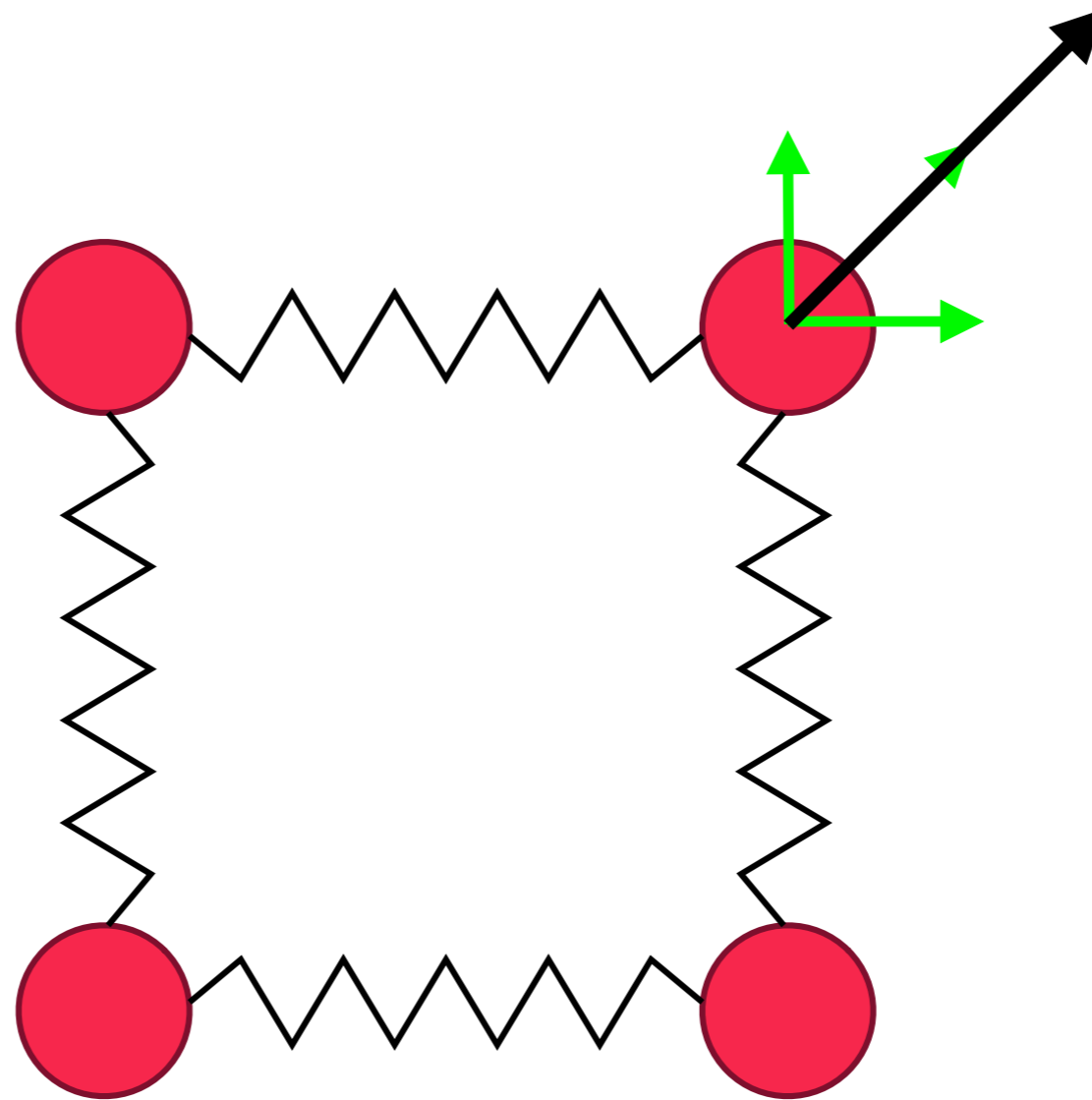
New view on Force based layout



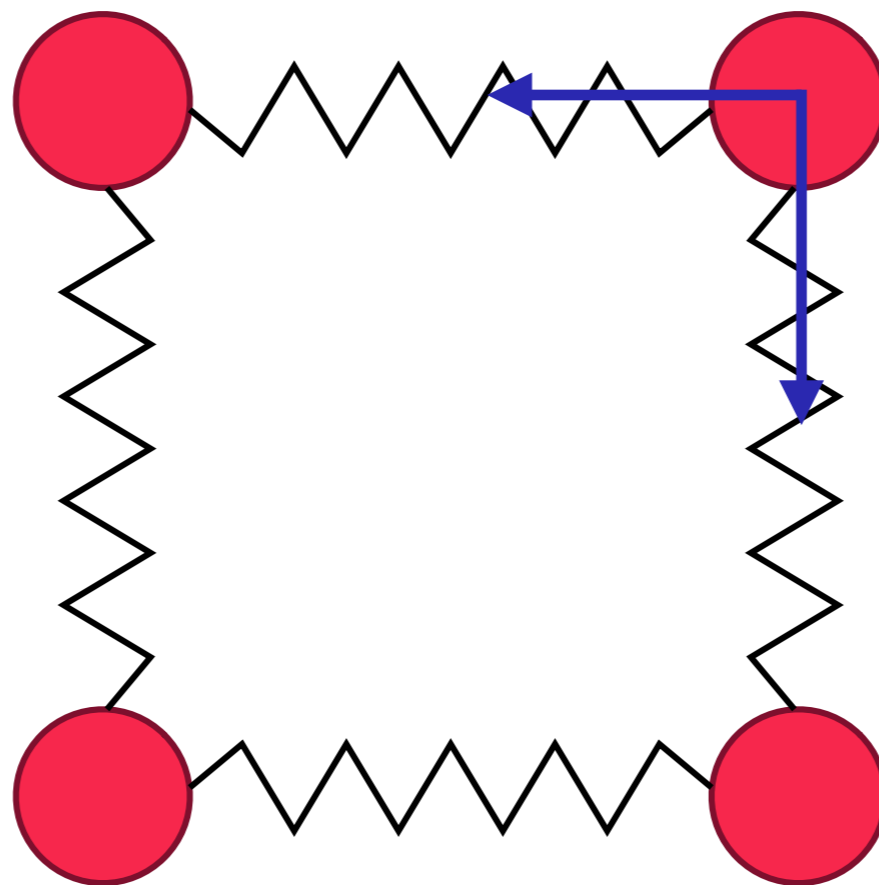
Nodes' Force



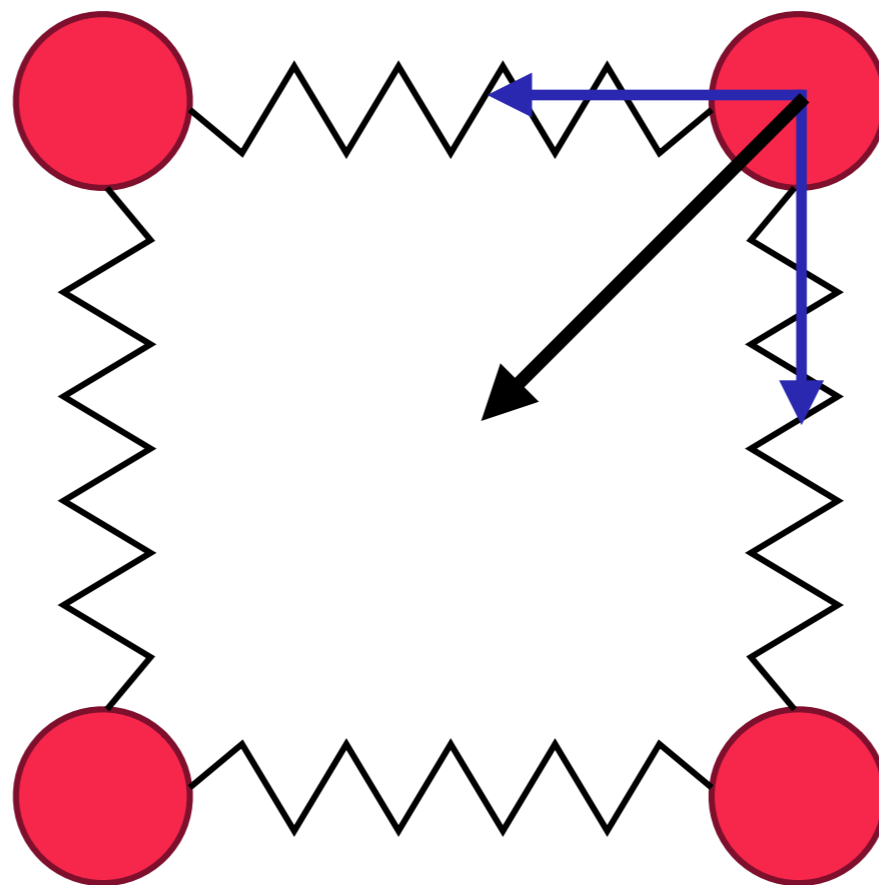
Nodes' Force



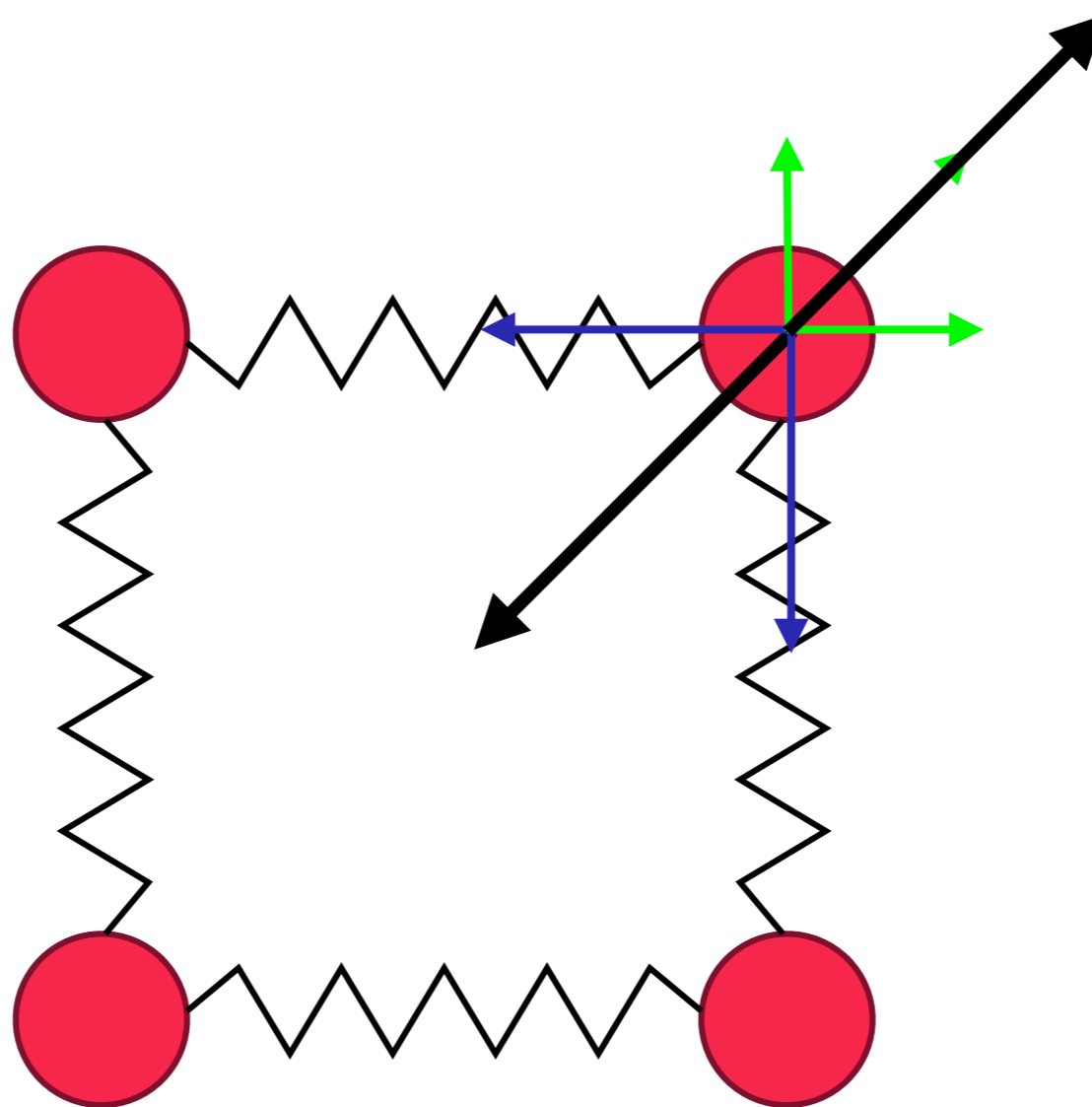
Springs' Force

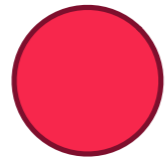


Springs' Force



Resulting Force





Repulsion Value

Mass

Repulsion Radius



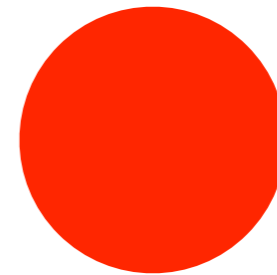
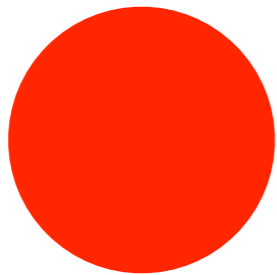
Stiffness

Ideal Length

Node: Repulsion Value



Node: Repulsion Value



Node: Repulsion Value

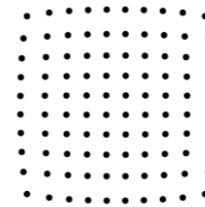
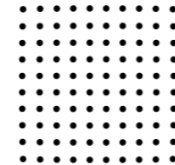
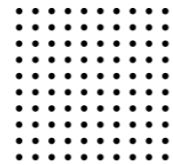
Repulsion Value \ Iterations

10

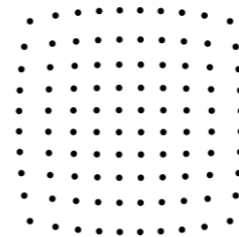
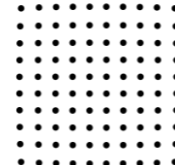
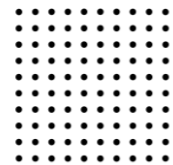
100

1000

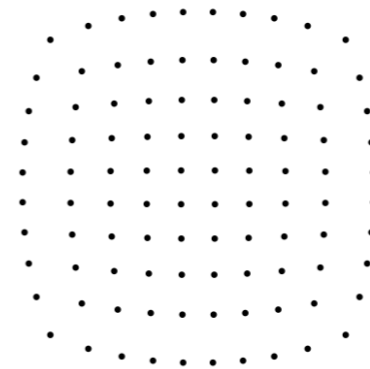
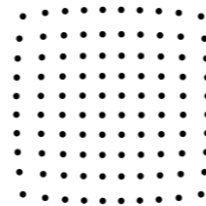
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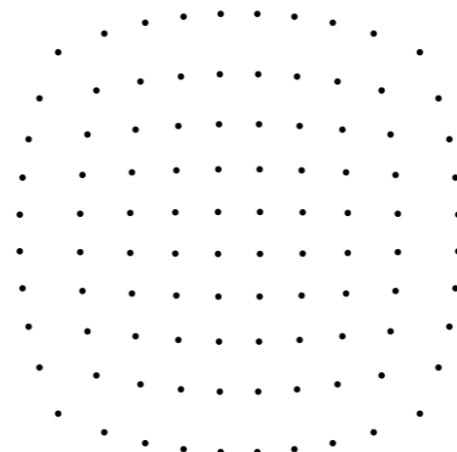
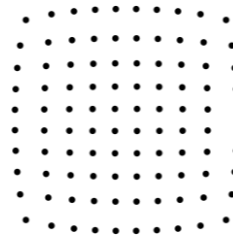
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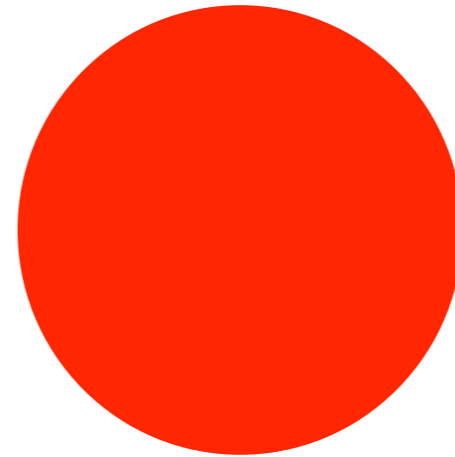
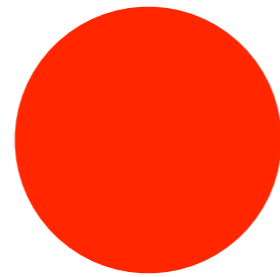
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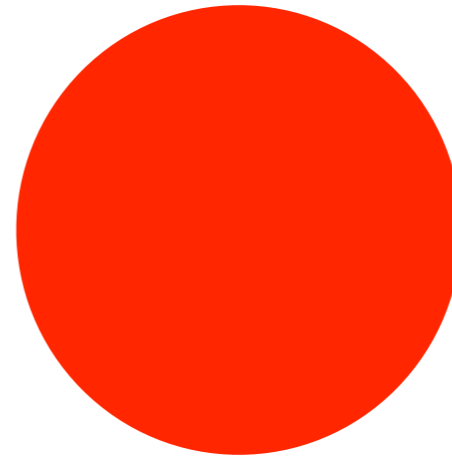
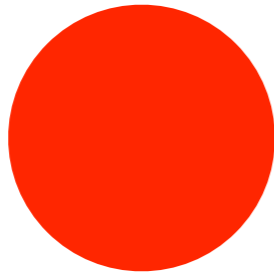
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Node: Mass



Node: Mass



Node: Mass

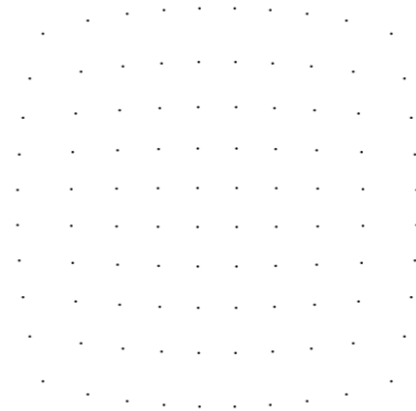
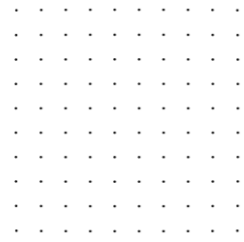
Mass \ Iterations

10

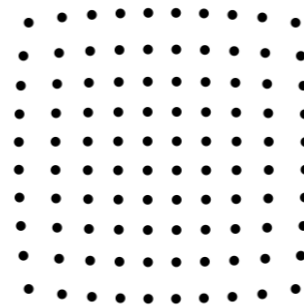
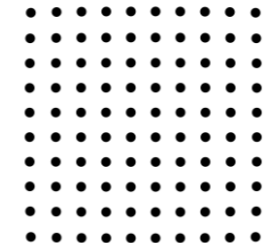
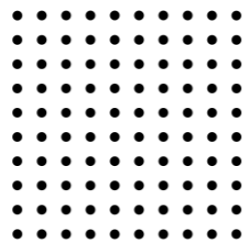
100

1000

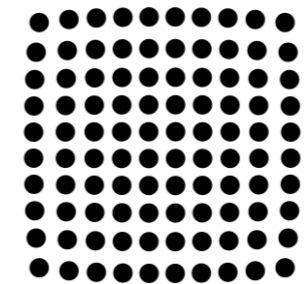
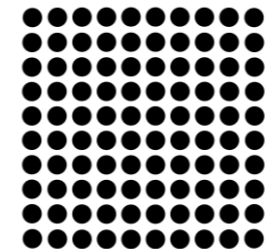
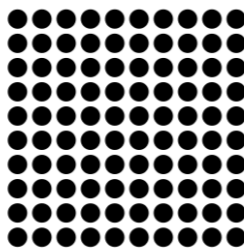
5



20



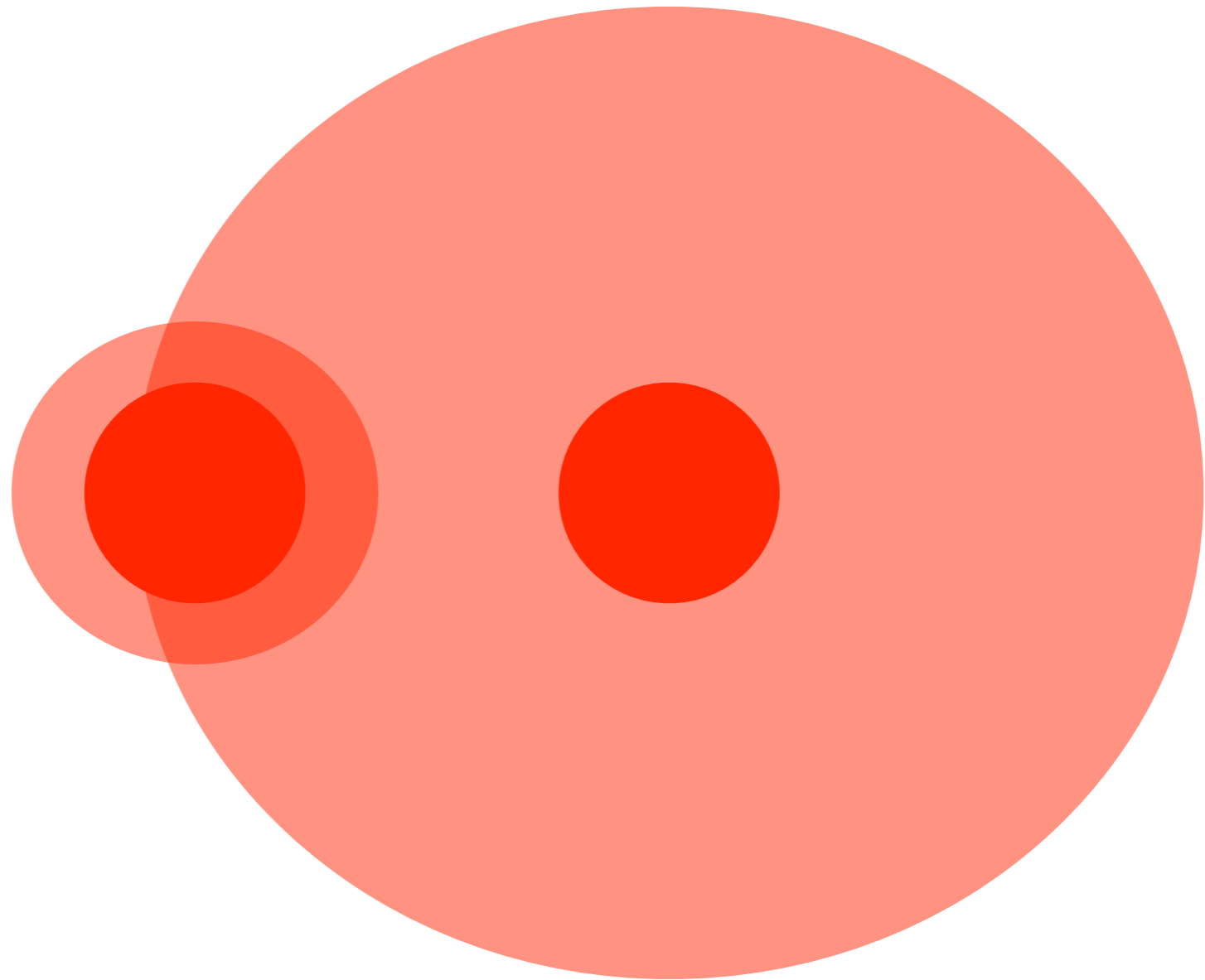
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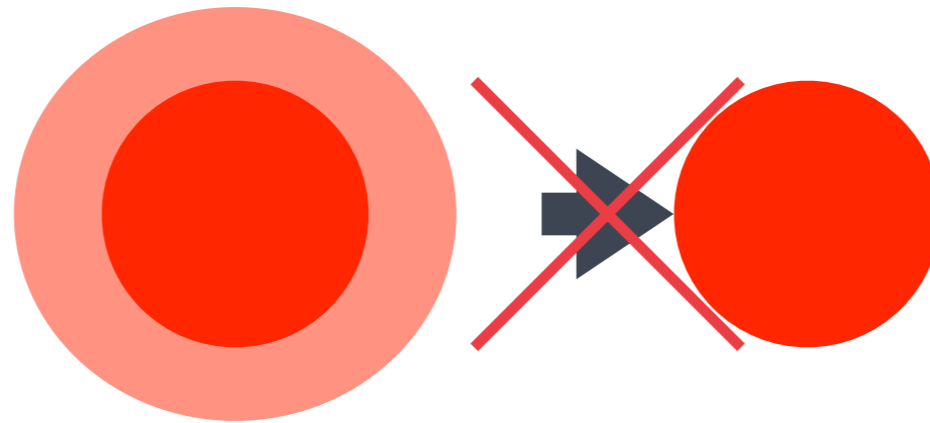
Node: Repulsion Radius



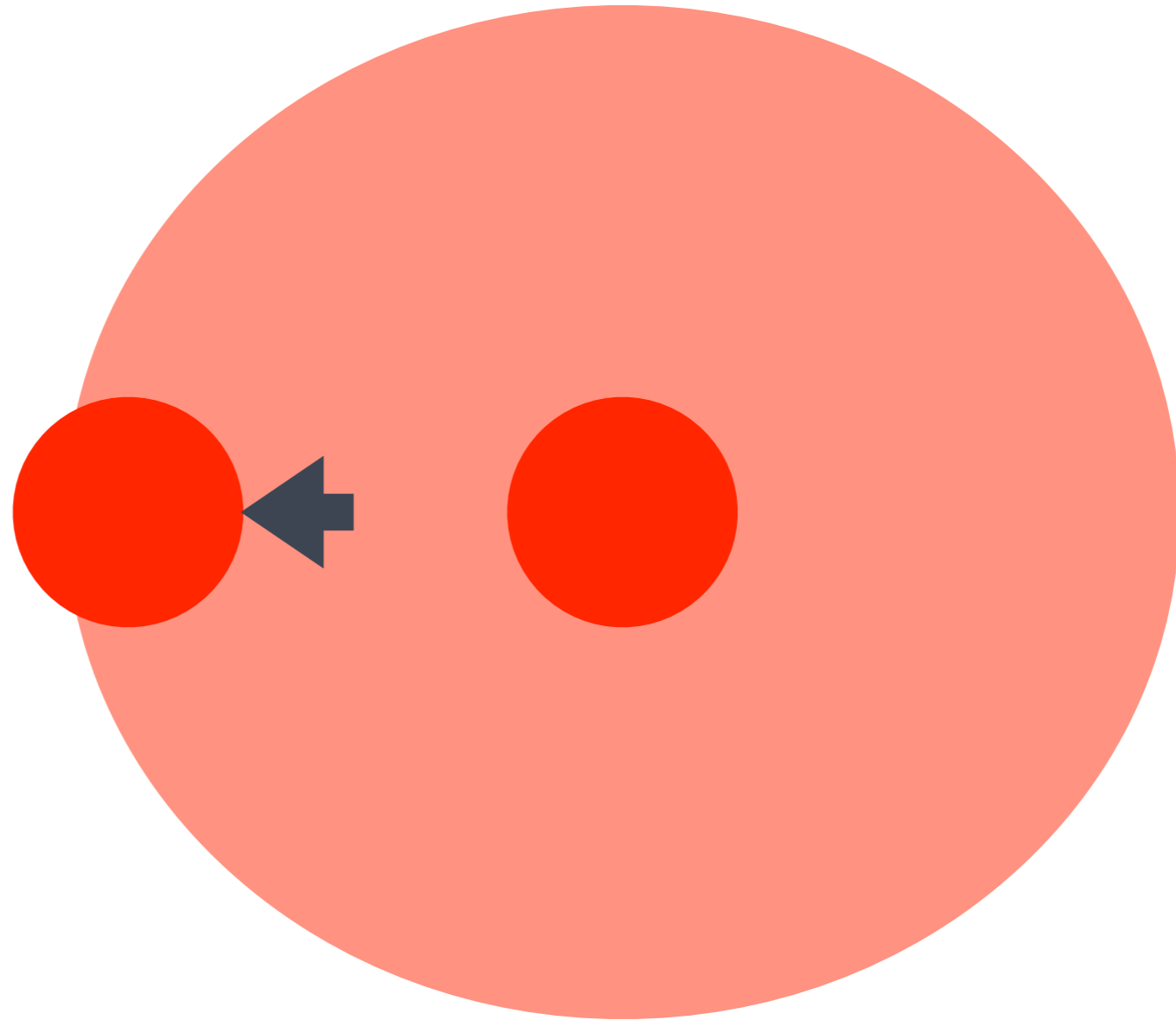
Node: Repulsion Radius



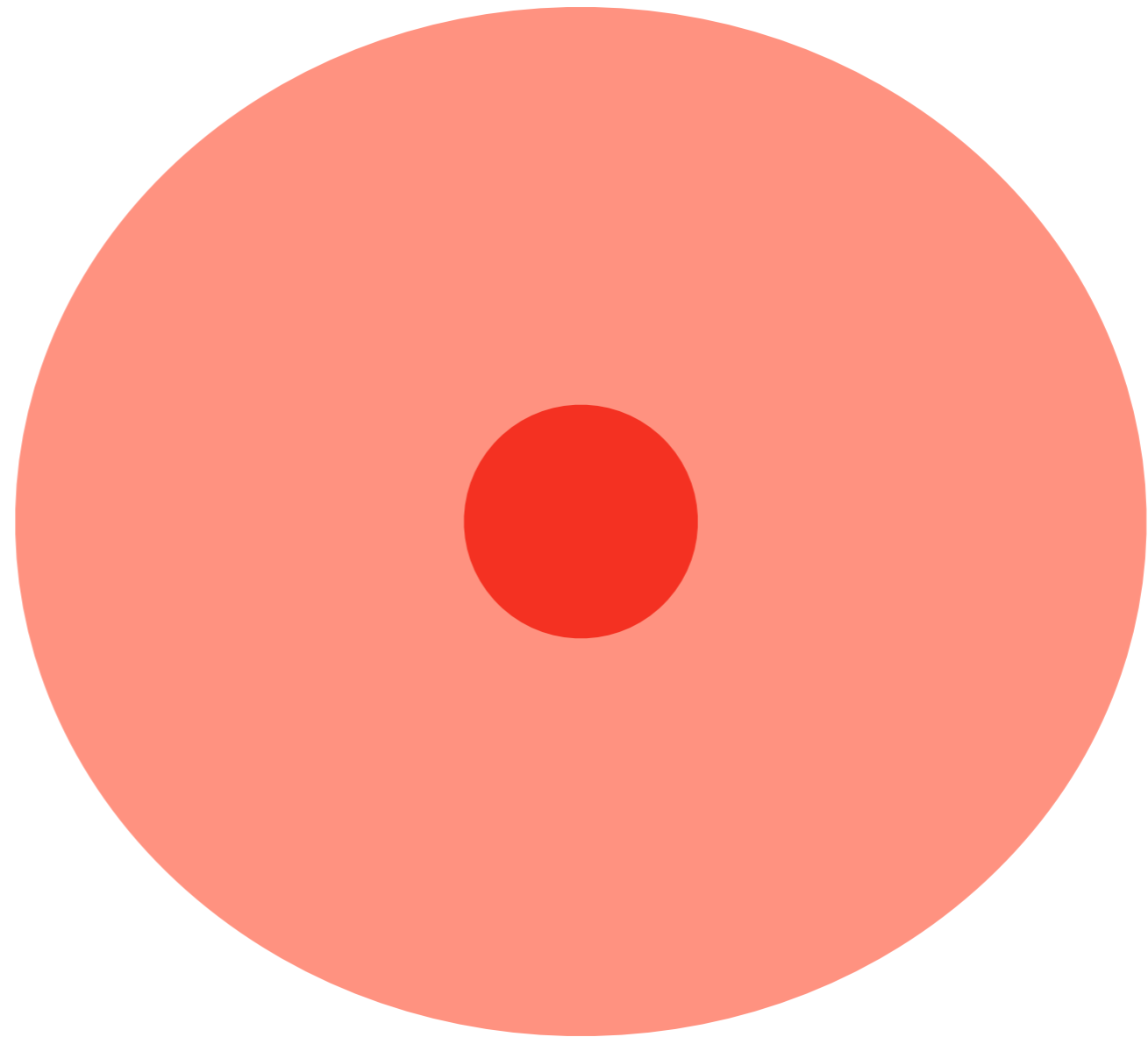
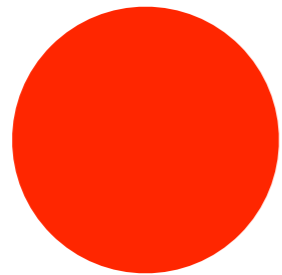
Node: Repulsion Radius



Node: Repulsion Radius



Node: Repulsion Radius



Node: Repulsion Radius

Iterations

10

100

1000



Edge: Stiffness



Edge: Stiffness



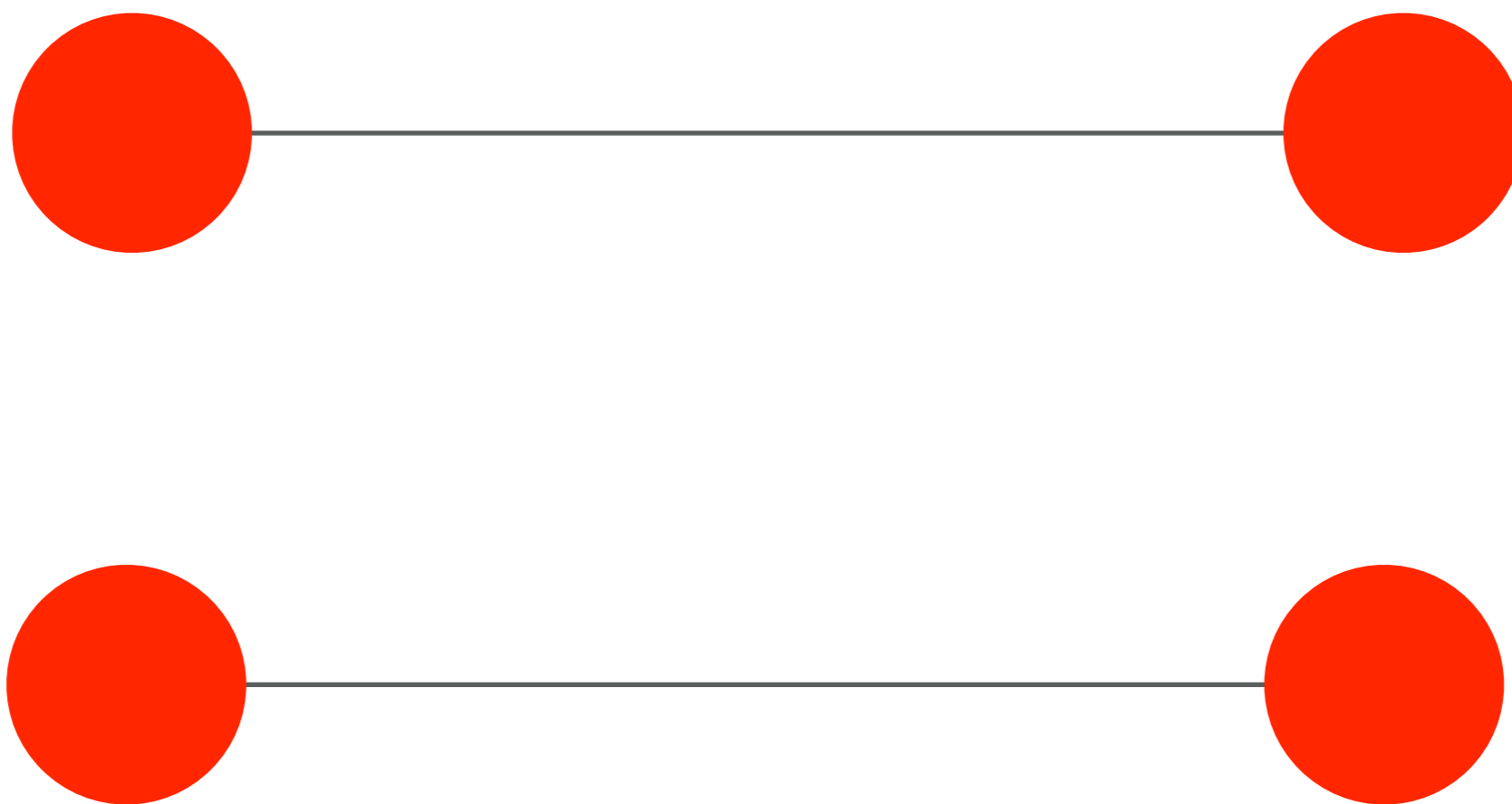
Stiffness 0.1

Stiffness 10

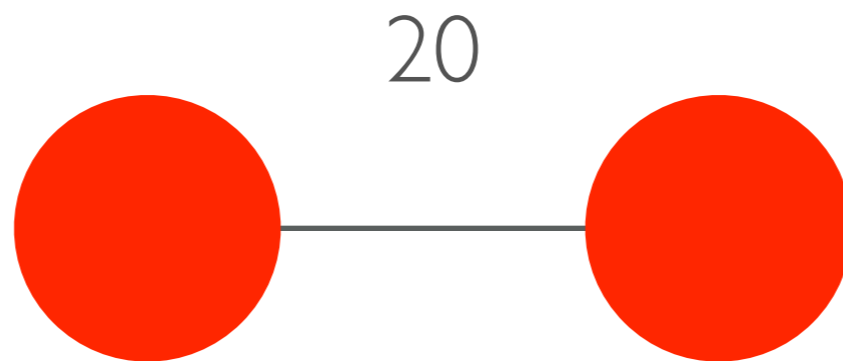
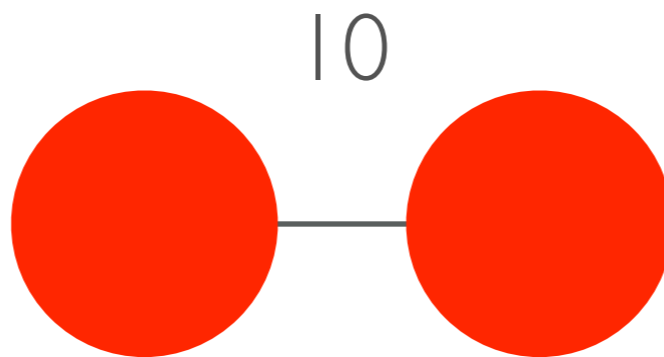


repulsion 50
iterations 50
ideal length 10
initial length 200

Edge: Ideal length



Edge: Ideal length



Ideal length 0



Ideal length 10



repulsion 1
iterations 50
stiffness 0.1
initial length 200

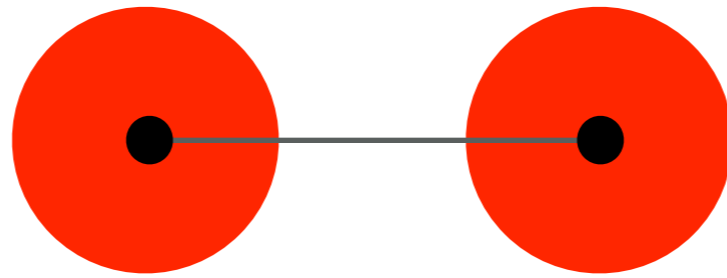
Features:

- Distance
- Time

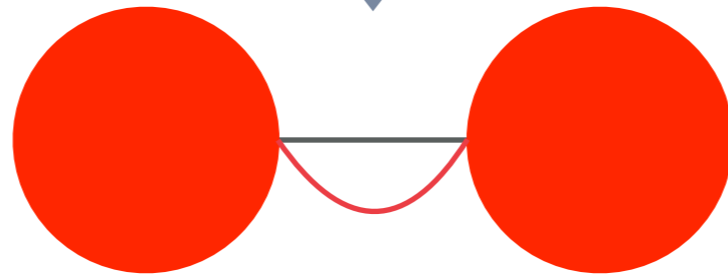
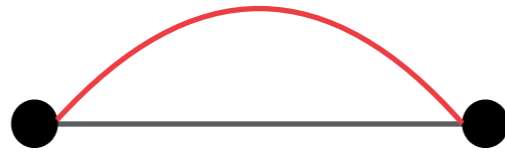
Distance



Distance



Distance



Distance

Iterations

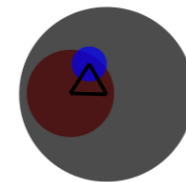
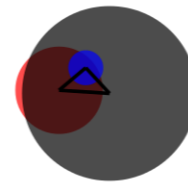
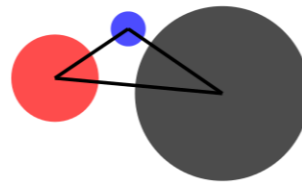
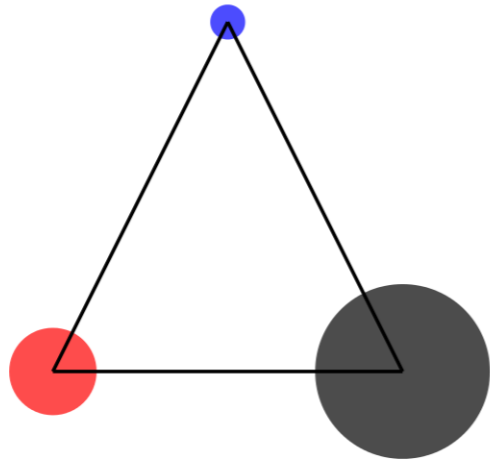
1

100

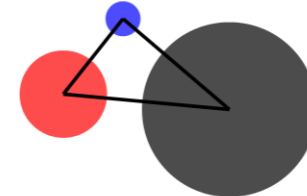
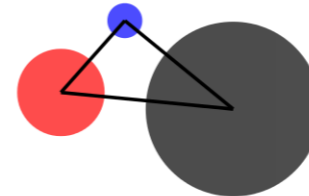
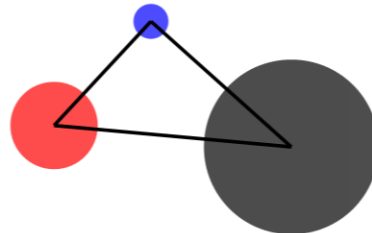
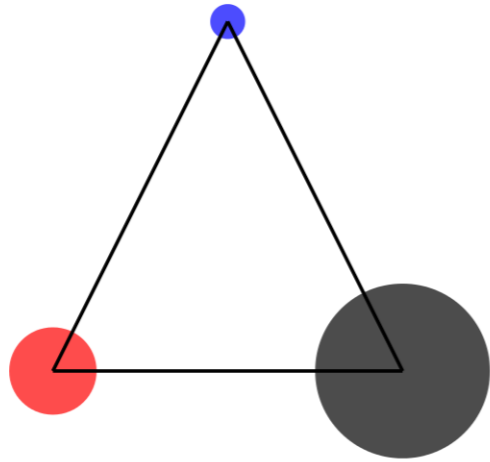
500

1000

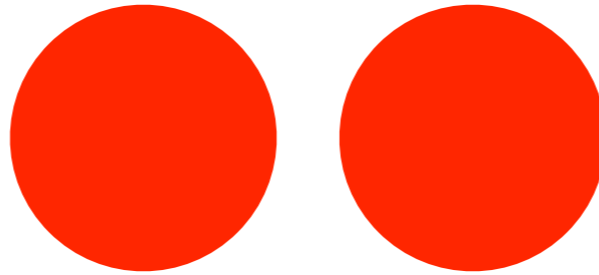
Traditional
distance



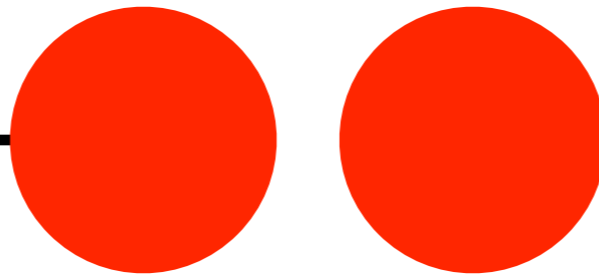
Padded
distance



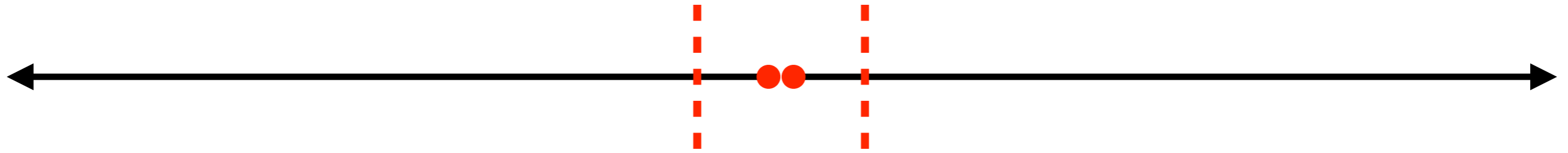
Slowing down the time



Slowing down the time



Slowing down the time

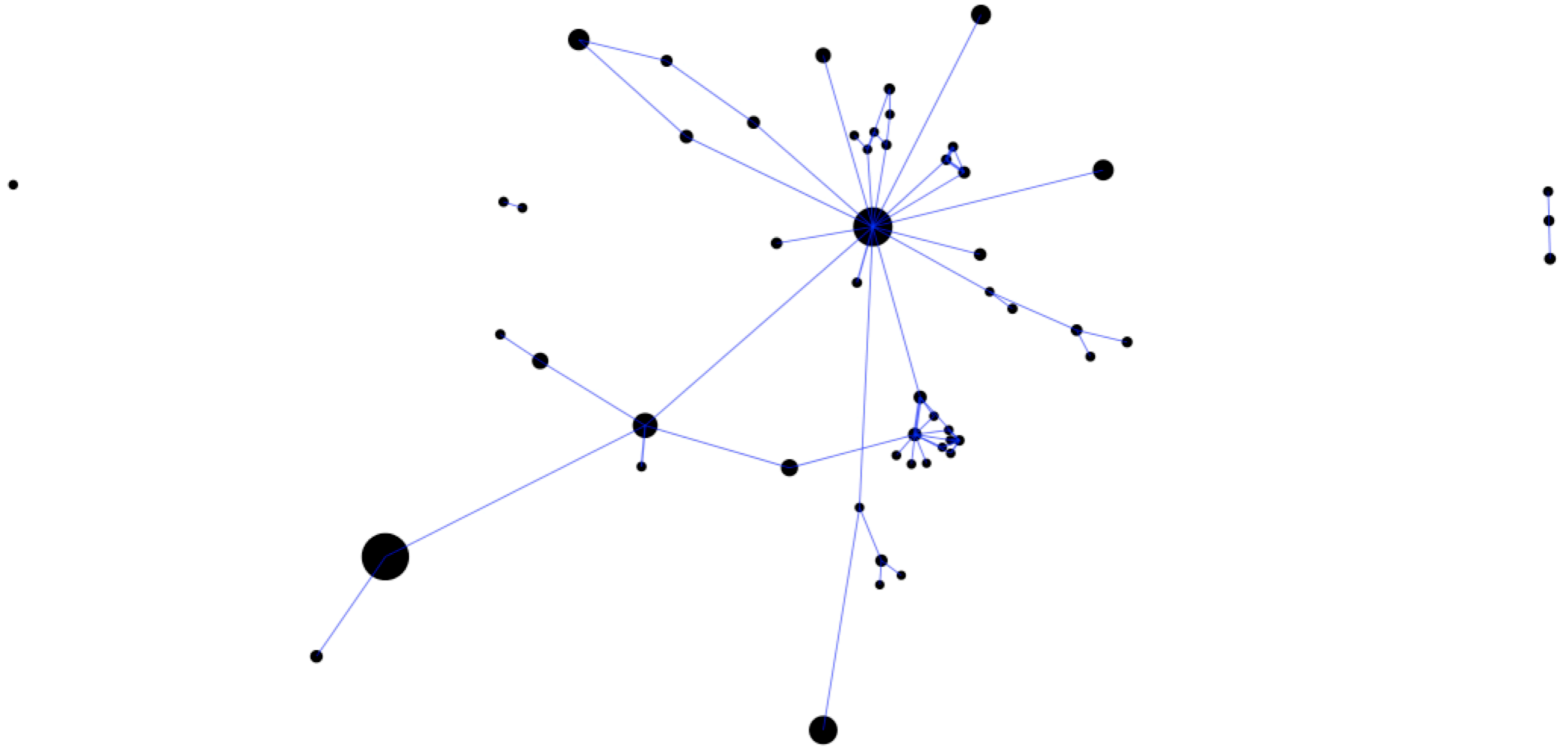


Slowing down the time

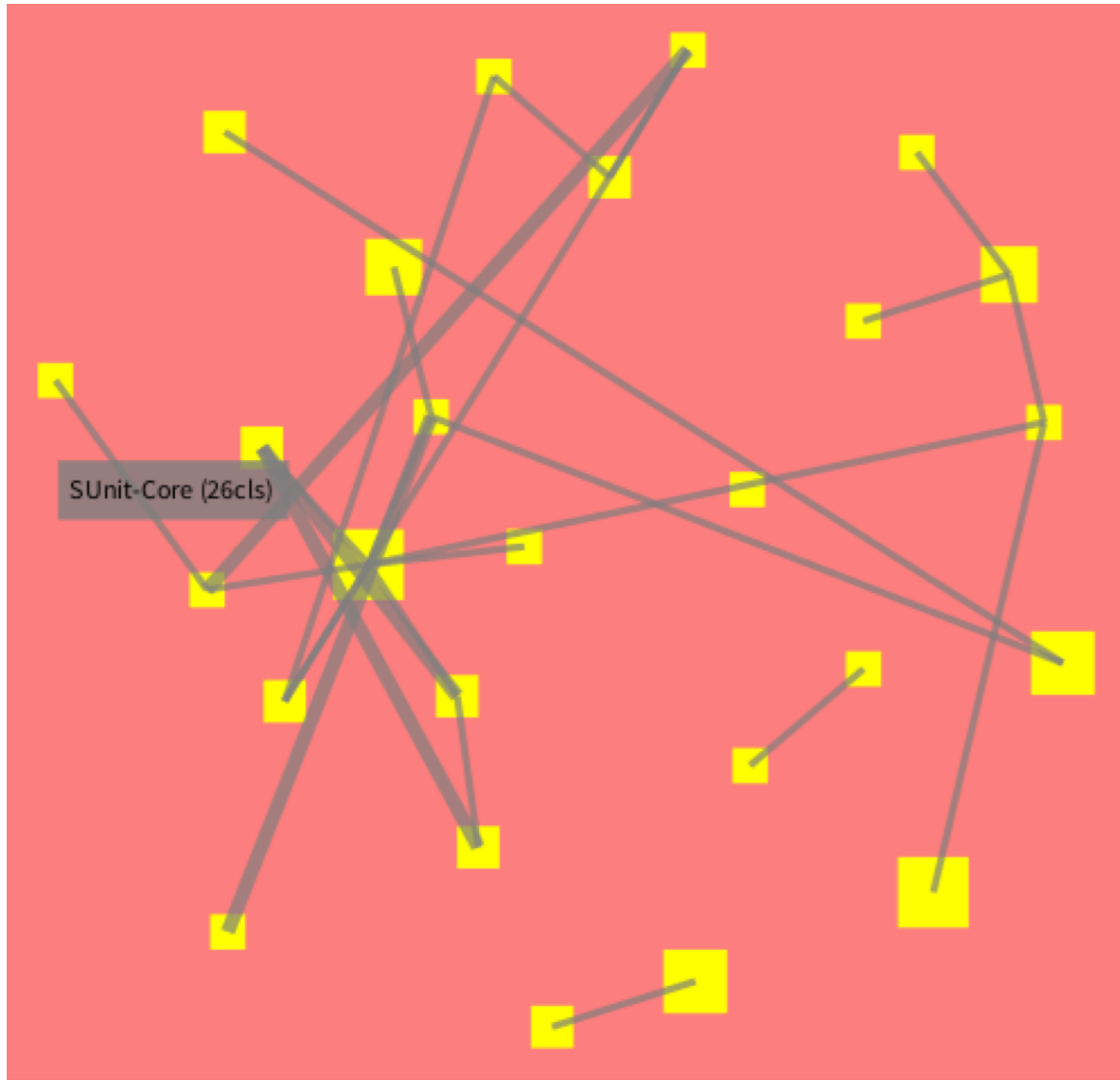


Slowing down the time

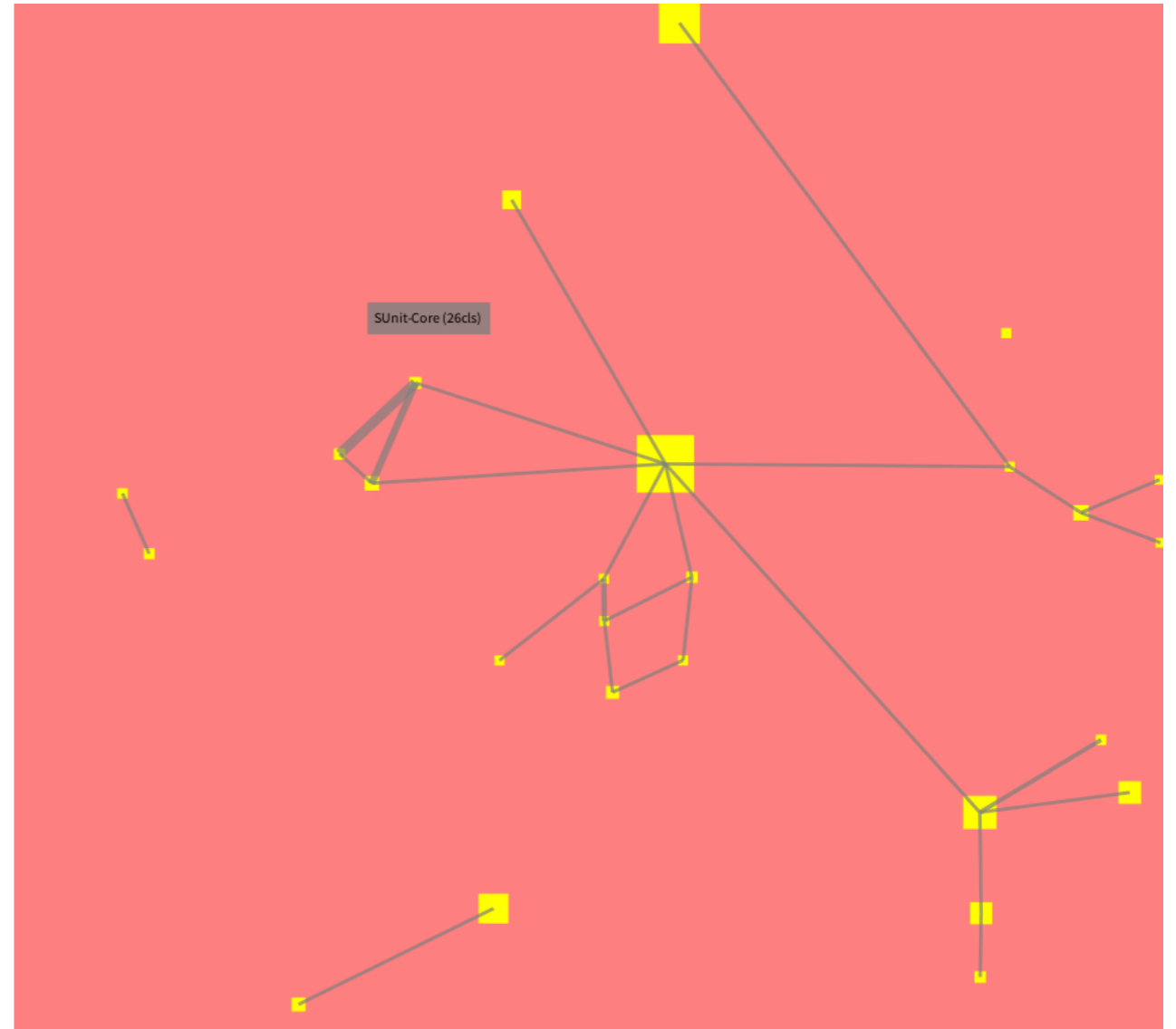




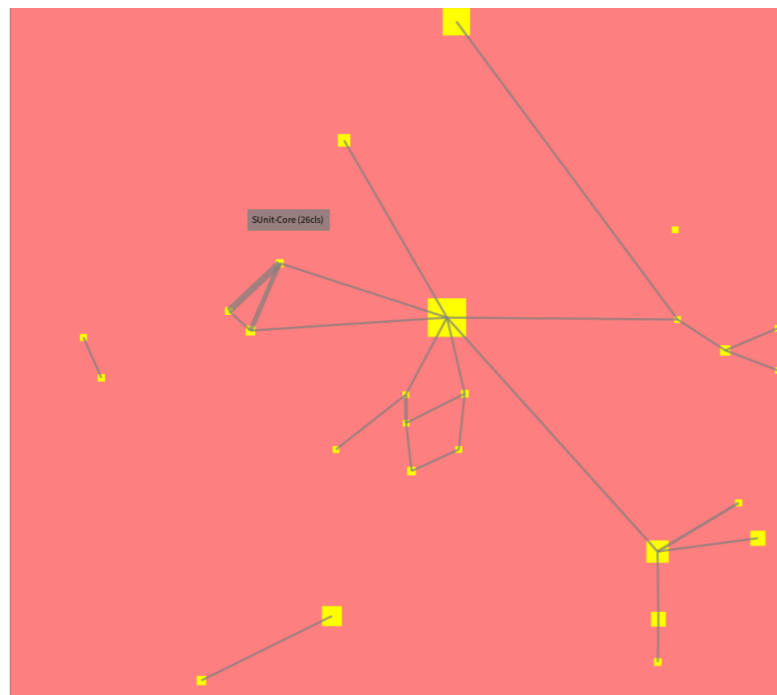
RTForceBasedLayout



RTFBLayout

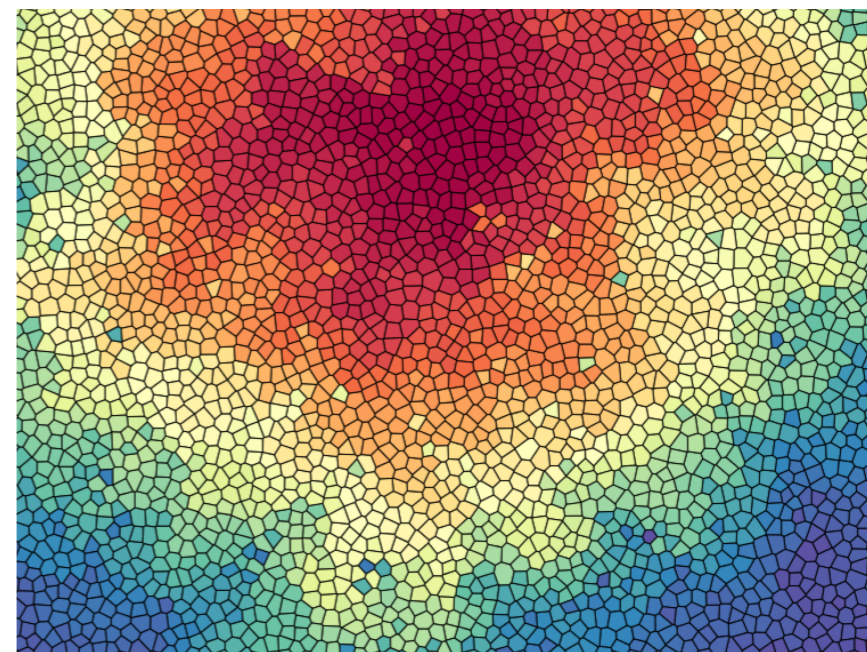


RTFBLayou



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Voronyj diagram



3D cities

+

