

The Birds & The Bees

Simon van Dyk @ Platform45

“A friend of mine once asked me what my research was based on, and I said, “artificial intelligence”, only to receive back a flurry of laughter since she associated the words “artificial intelligence” with aliens.”

– Melissa Donaldson

AI is
misunderstood...
...so is CI.

> defined? CI

=> nil

... where does it fit in?

AI

Weak
AI

Strong
AI

“Specific”

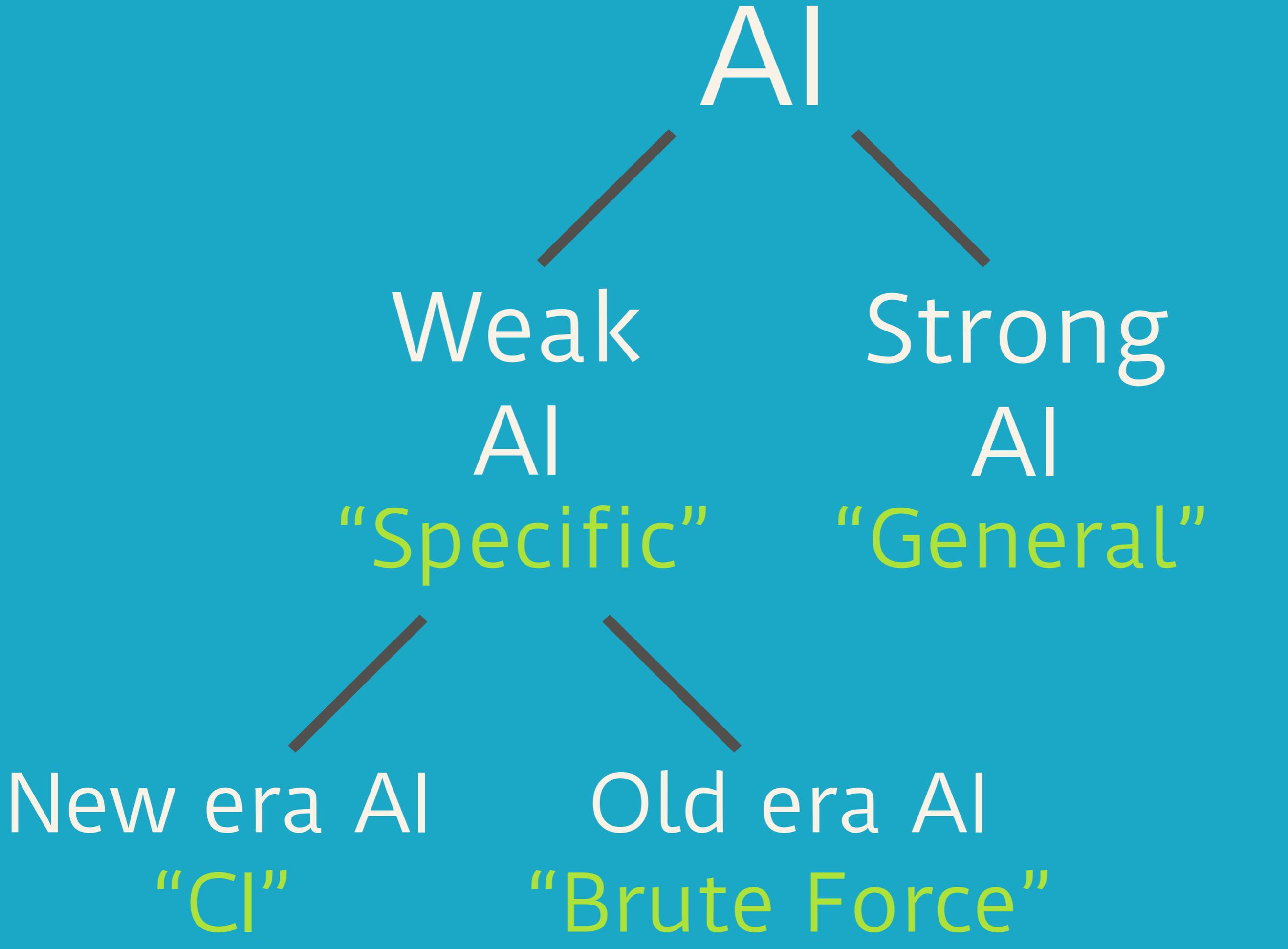
“General”

New era AI

Old era AI

“CI”

“Brute Force”



CI

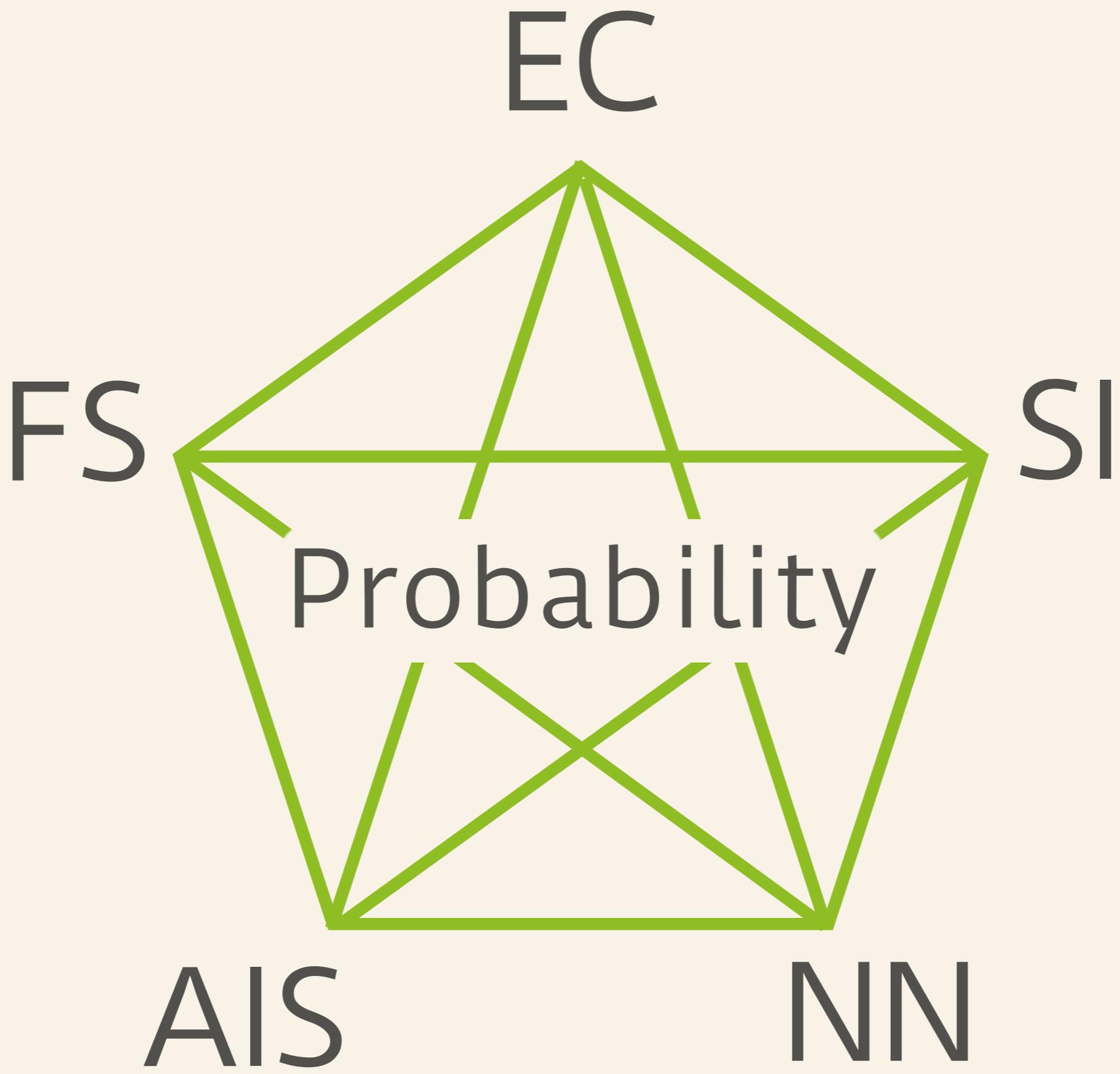
EC Evolutionary Computation

SI Swarm Intelligence

FS Fuzzy Systems

NN Neural Networks

AIS Artificial Immune Systems



Swarm

Intelligence



Swallows flock

A close-up photograph of a large number of ants working together to build a bridge across a gap in a leaf. The ants are carrying small pieces of plant material, likely twigs or fibers, which they are weaving together to create a path. The background is a solid, muted teal color.

Ants
build

A photograph showing a dense line of ants marching along a seed head of a plant in a field of tall grass. The scene is captured in a monochromatic blue-green color scheme. The ants are small, dark, and form a thick, continuous line across the seed head. The background consists of out-of-focus blades of grass.

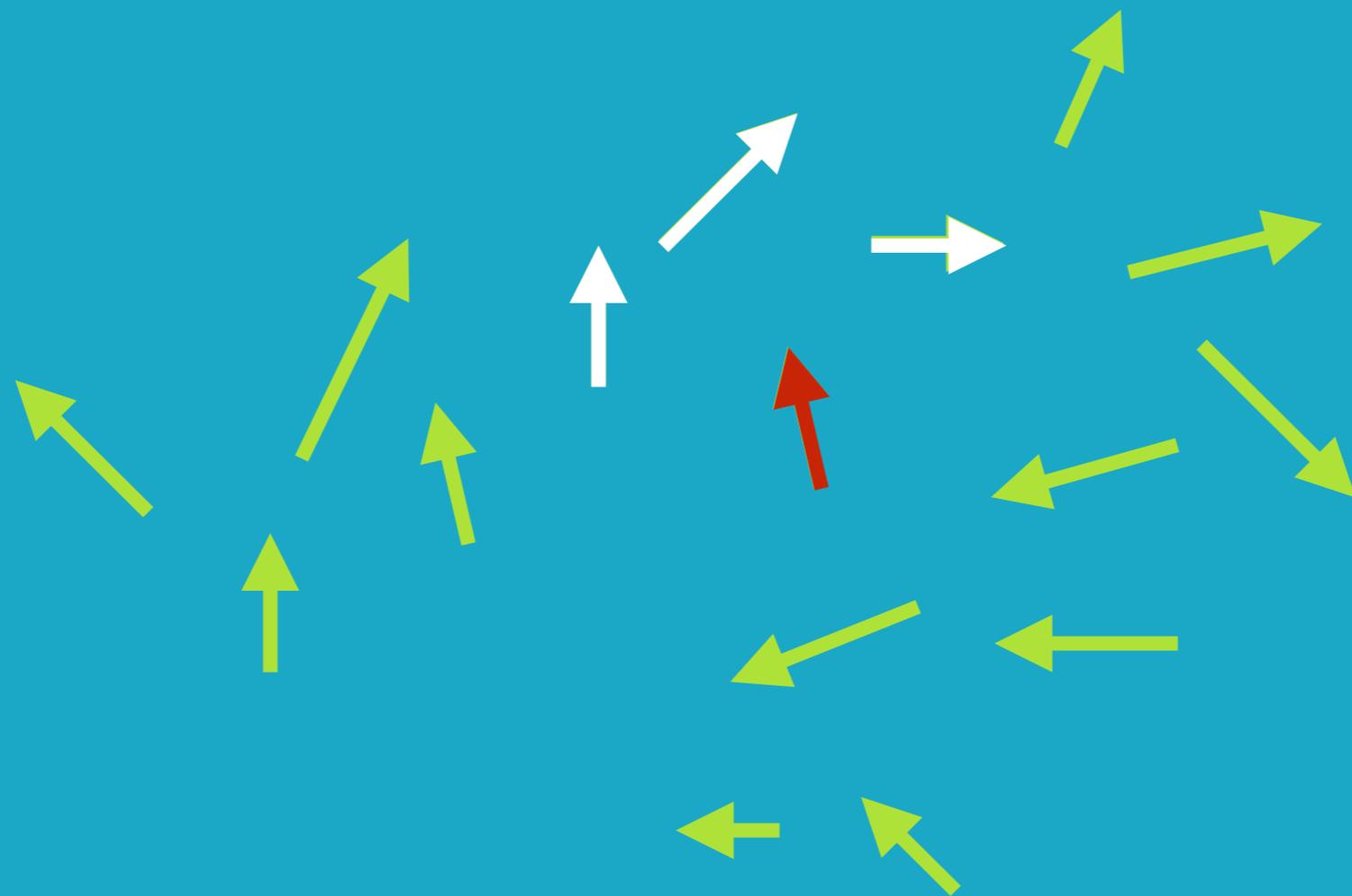
Ants survive

Emergence

complexity from
simplicity



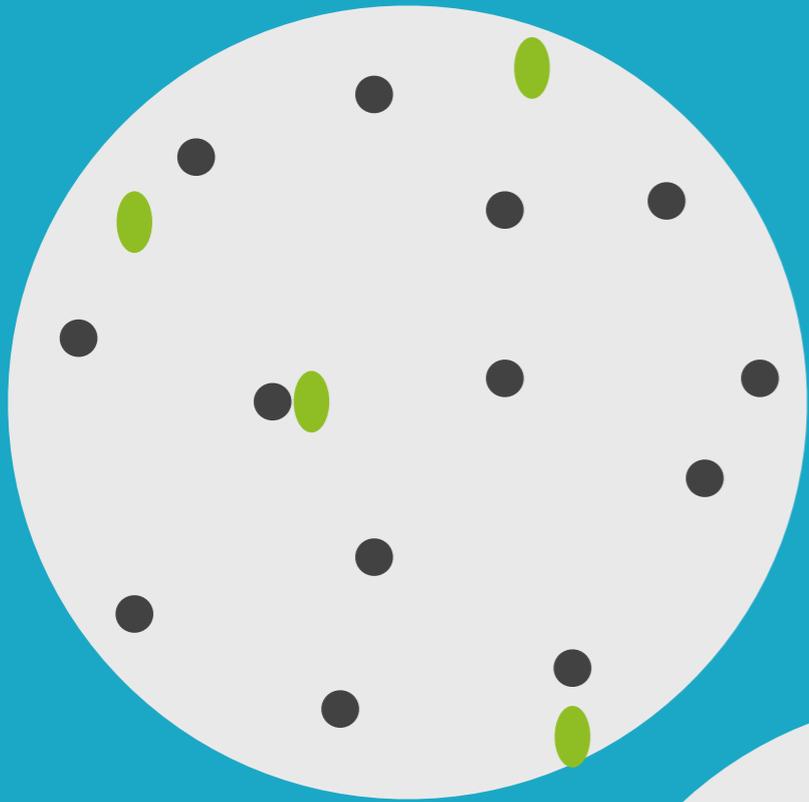
Communication on some channel



Ants for data
clustering

Cemetery Formation

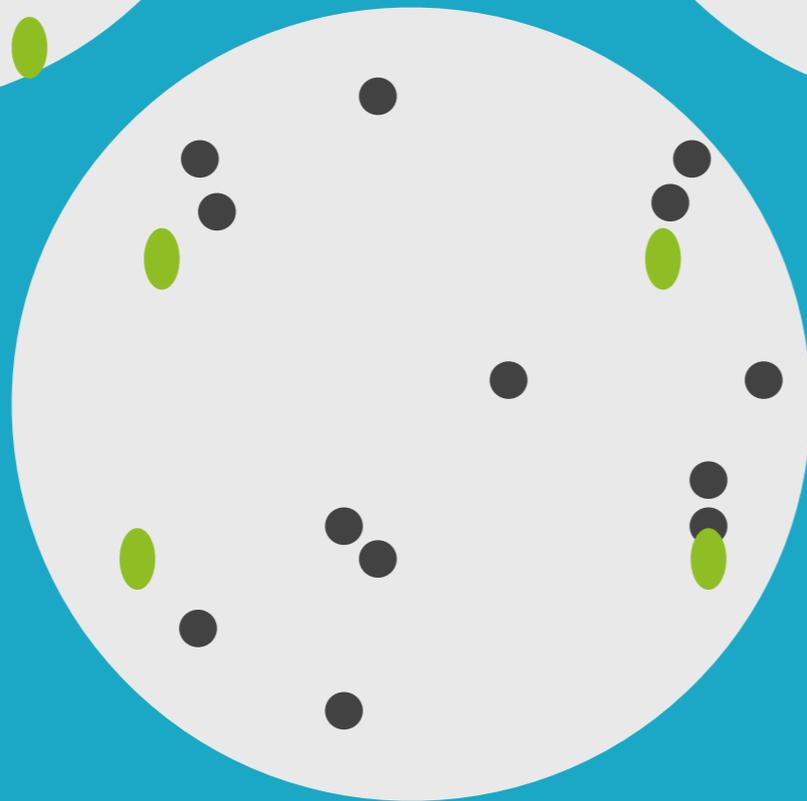
1



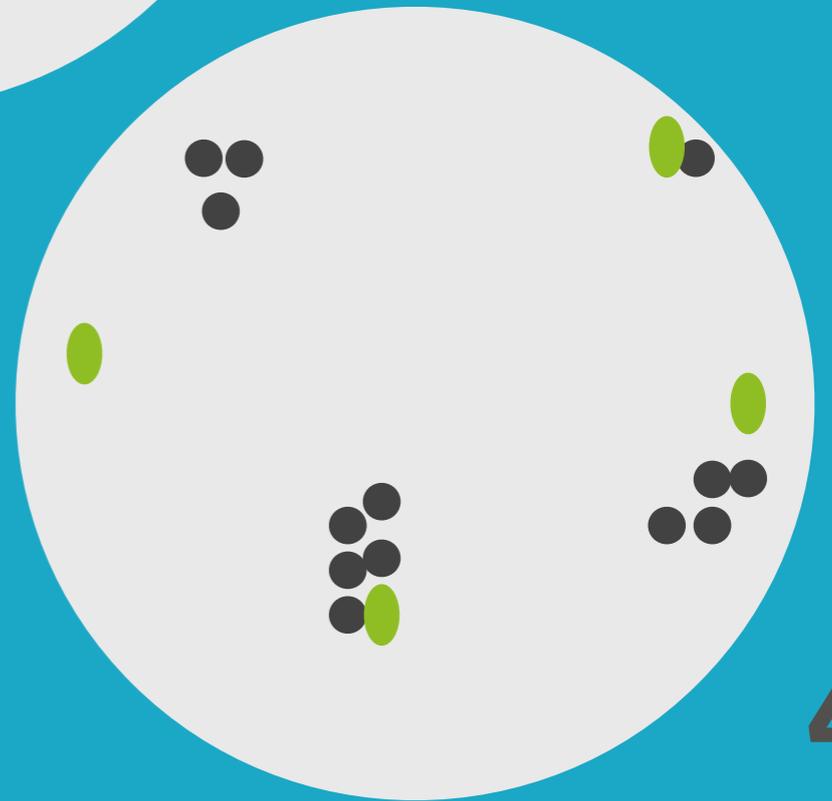
3



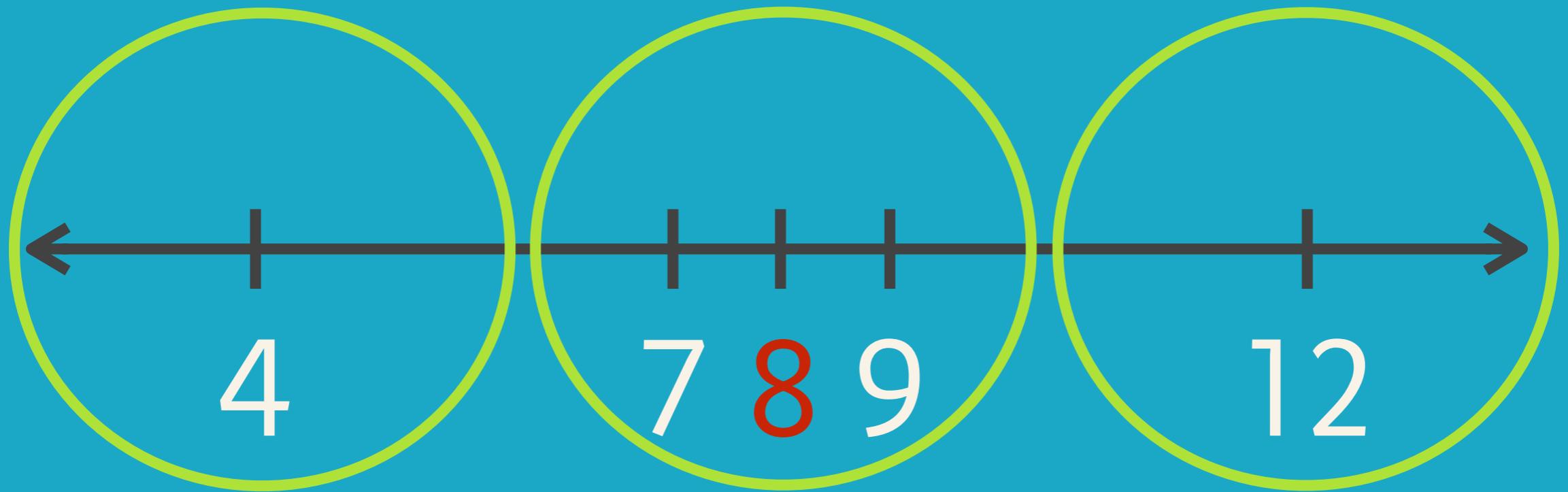
2



4



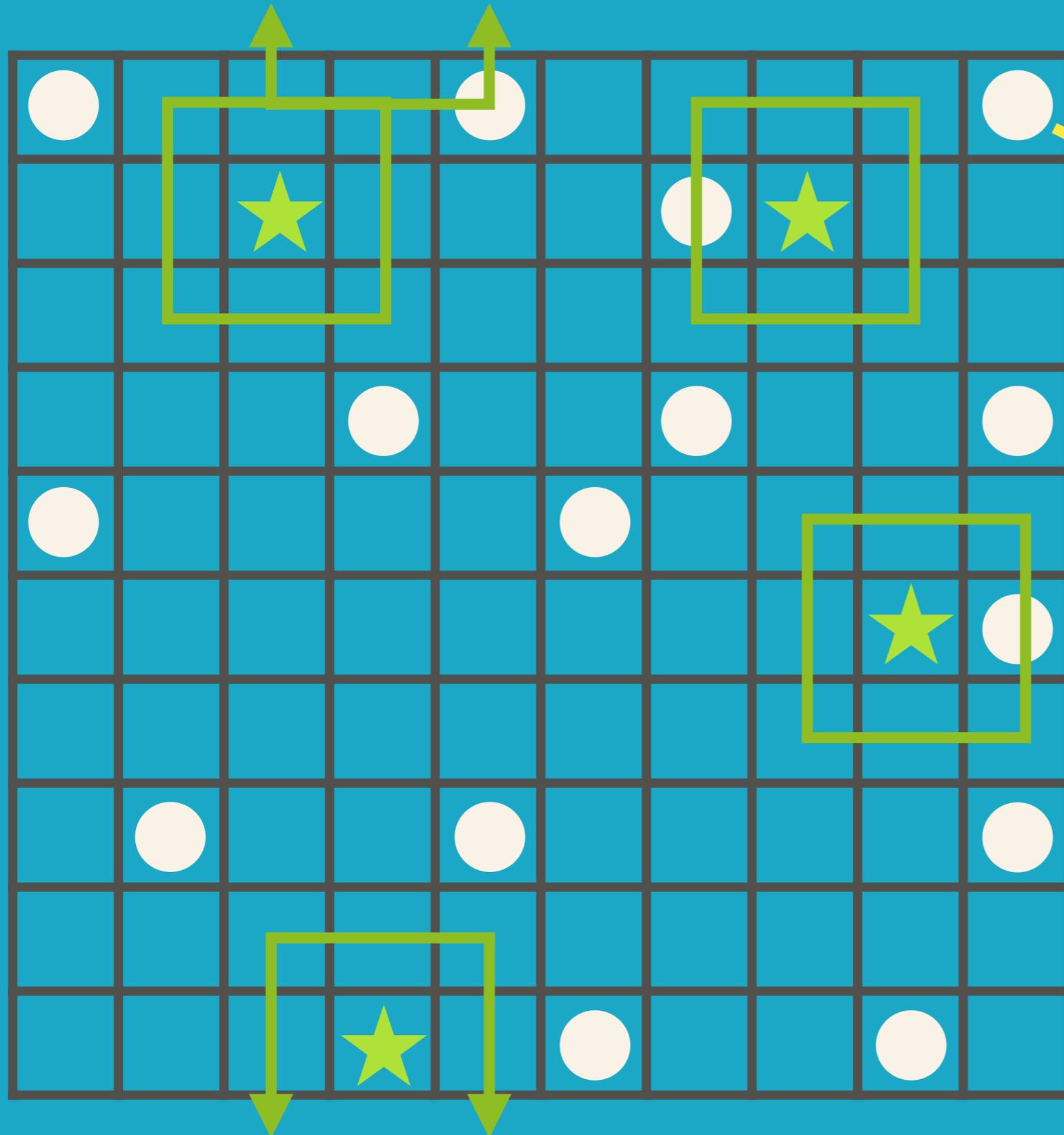
Data Clustering



```
dataset = [d1..d2] too large
cluster = dataset.select do |d|
  d.is_similar_to(cluster.centroid)
end
```

don't know this

The Models



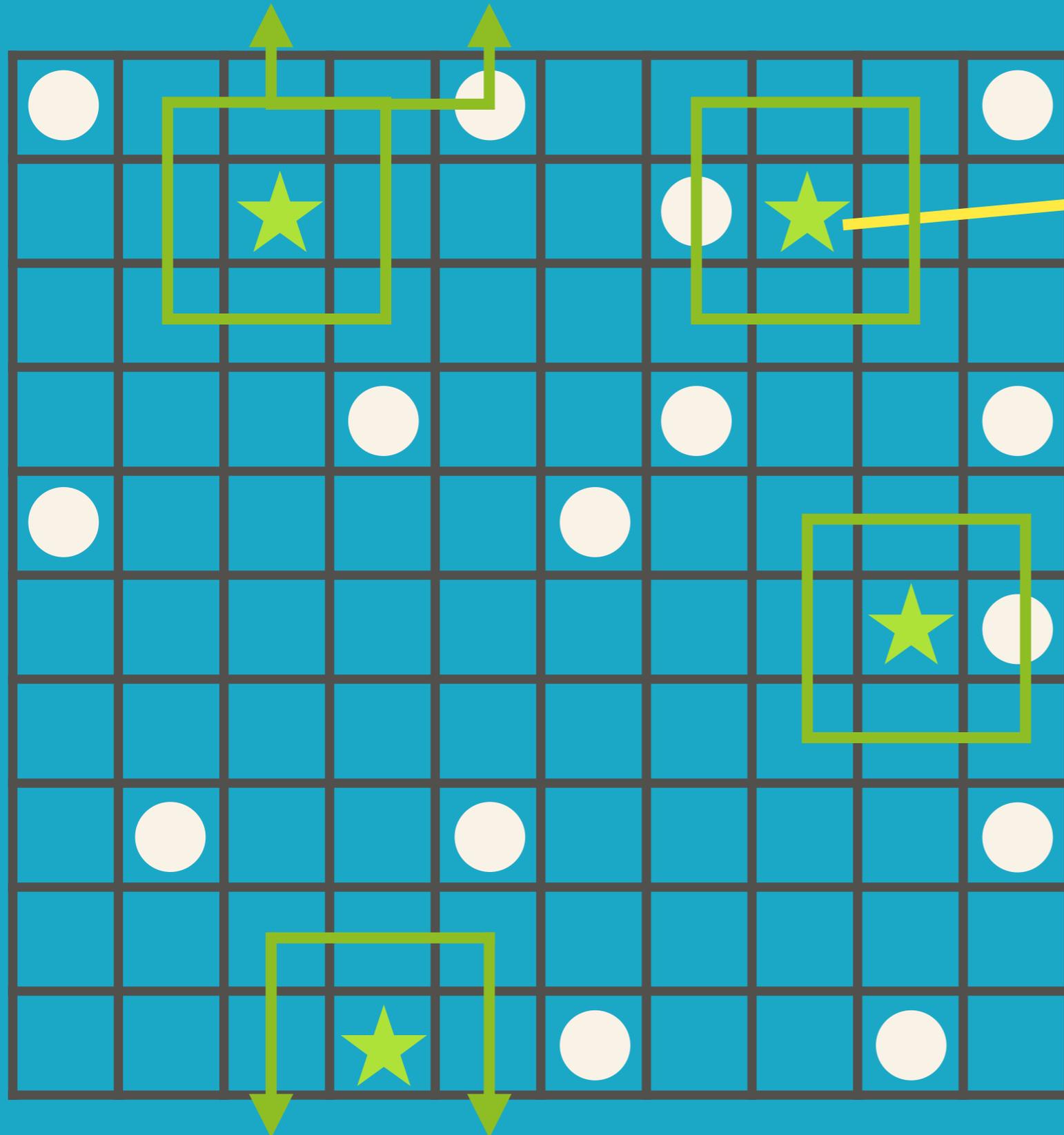
User 123

```
data:  
  interests: {  
    music: [],  
    sport: [],  
    food: [],  
    tech: [],  
  }
```

```
behaviour:  
  similar()
```

...

The Models



Ant 456

```
behaviour:  
  perceive()  
  act()  
  move()  
  
...
```

The Algorithm

```
place_items
place_ants
ITERATIONS.times do
  ants.each do |ant|
    ant.perceive_and_act
    ant.move
  end
end
```

The Ant

```
def perceive_and_act
  similarity = [
    neighbors.inject do |result, neighbor|
      result += similarity(item, neighbor)
    end / neighbors.length, 0].max
  random = Random.rand

  if unladen? and position.kind_of?(Item)
    pickup(item) if random < pickup_prob(similarity)
  elsif laden? and position.empty?
    drop(item) if random < drop_prob(similarity)
  end
end
```

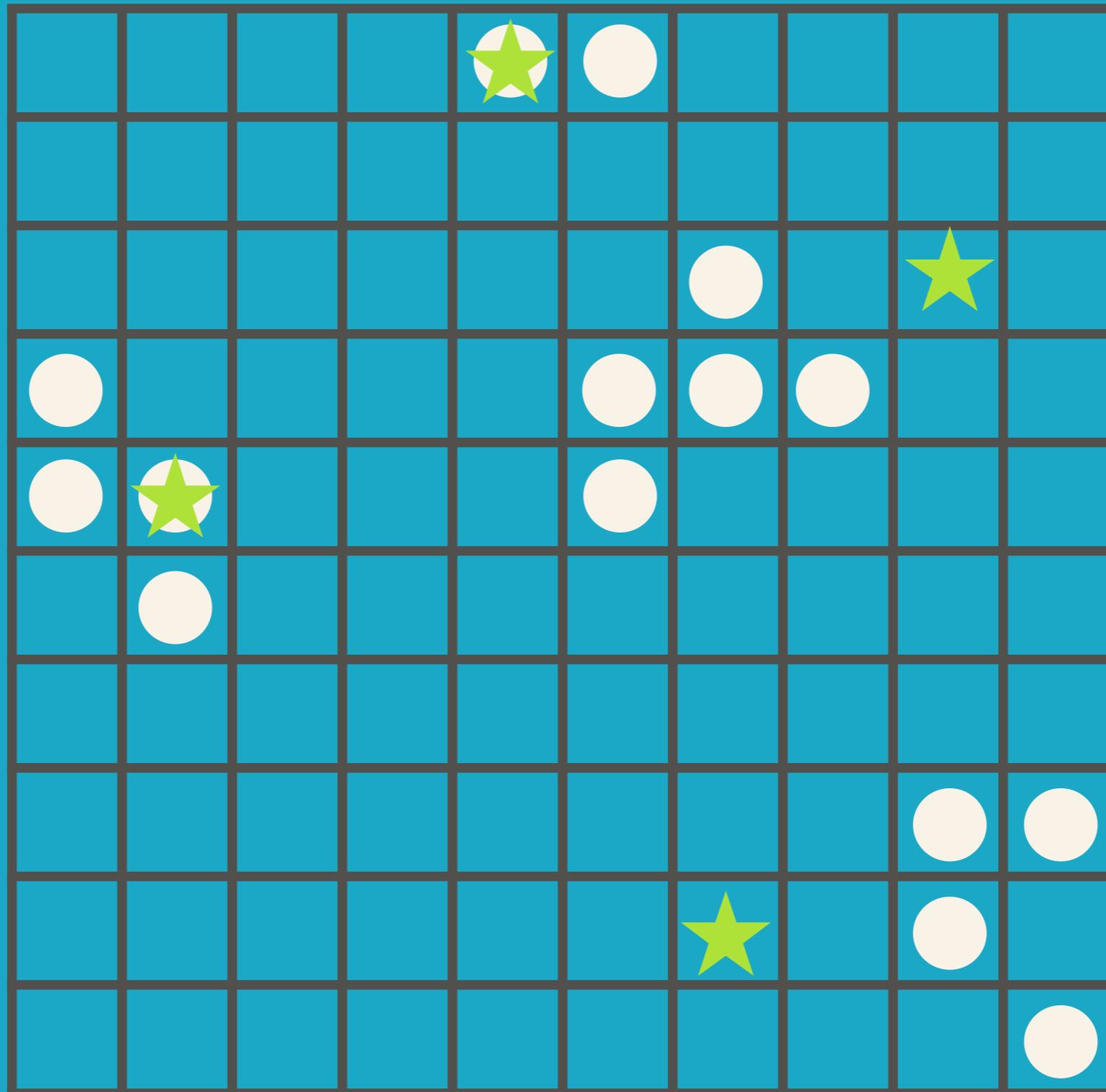
The Ant

```
def move  
  # select random adjacent position and move  
end
```

The Item

```
def similarity  
  # num interests in common  
end
```

The Result!



'Picks'

7min

npr.org

"how ants bury their dead"

2min

<http://indianapublicmedia.org>

"ants and their dead"

Thank you!



@siefi



sighmin/birds-and-bees



simon@platform45.com

Questions?



@siefi



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simon@platform45.com

fin.