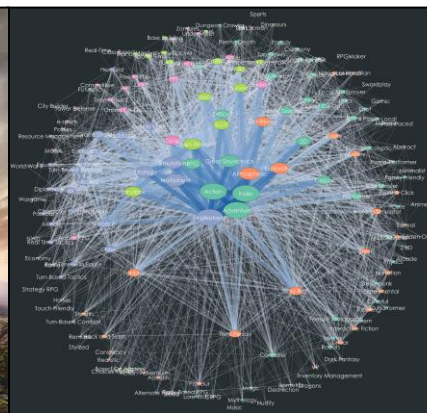




Universiteit
Leiden

Digital Approaches to Historical Inquiries

10th Class



Assignment 7

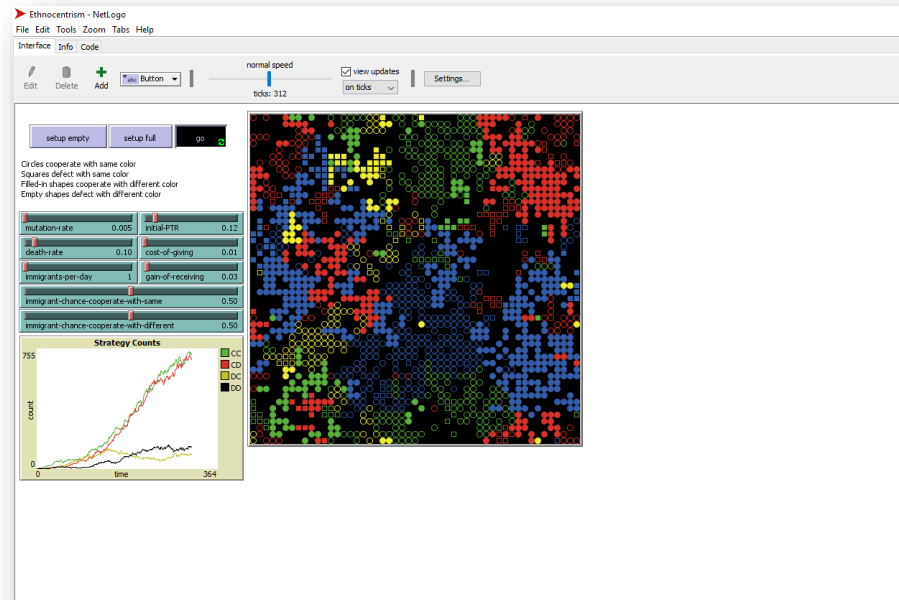
- Work your way through the Netlogo tutorial, from the [Sample Model, Running Models, Commands](#)
 - Suggested: [Procedures](#)
- Next pick a Netlogo model from this list:
 - [Altruism](#)
 - [Mammoths](#) (does not work in browser)
 - [Vision Evolution](#)
 - [Team Assembly](#)
 - [Rebellion](#)
 - [Ethnocentrism](#)
 - [Oil Cartel](#) (Hubnet, multiplayer, remote login)
- Describe the model (300 words max)
- Evaluate the model vs. criteria of Romanowska
 - Each point (300 words max)
 - Focus on if and, if so what, you learned about the phenomenon for the “was the model useful?” criterium.

What makes a good agent-based model? (Romanowska 2014)

- Scope
 - Is the model question driven?
- Appropriateness
 - Is the model (agent behavior and environment) appropriate to the phenomenon under inquiry?
- Resolution
 - Is the resolution (scale) of the model vizaviz the phenomenon it tries to address?
- How complicated (“complex”) is it?
 - Simpler is better
- Parsimony
 - How closely does the model stick to real word observations of the phenomena (“the data”)
 - Were alternatives considered and tested?
- Was the model useful?

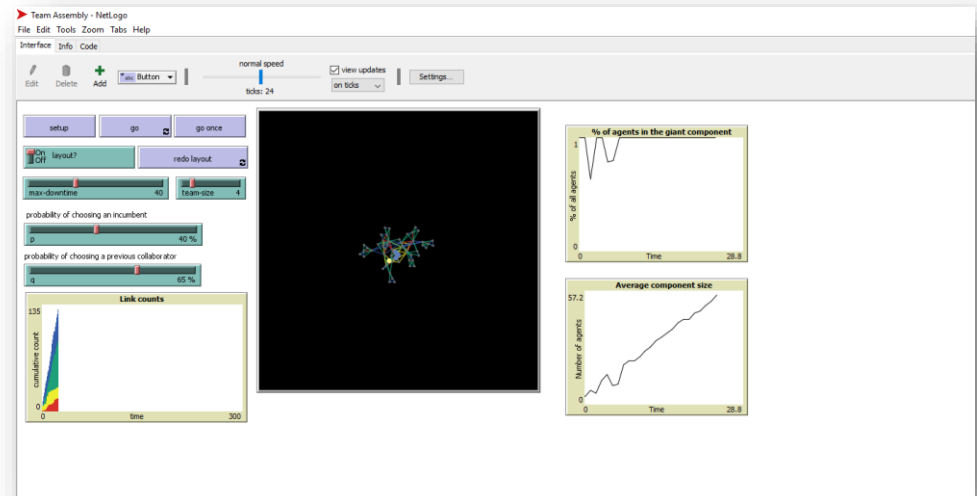
Max on Ethnocentrism

- Scope
- Appropriateness
- Resolution
- How complicated (“complex”) is it?
- Parsimony
- Was the model useful?



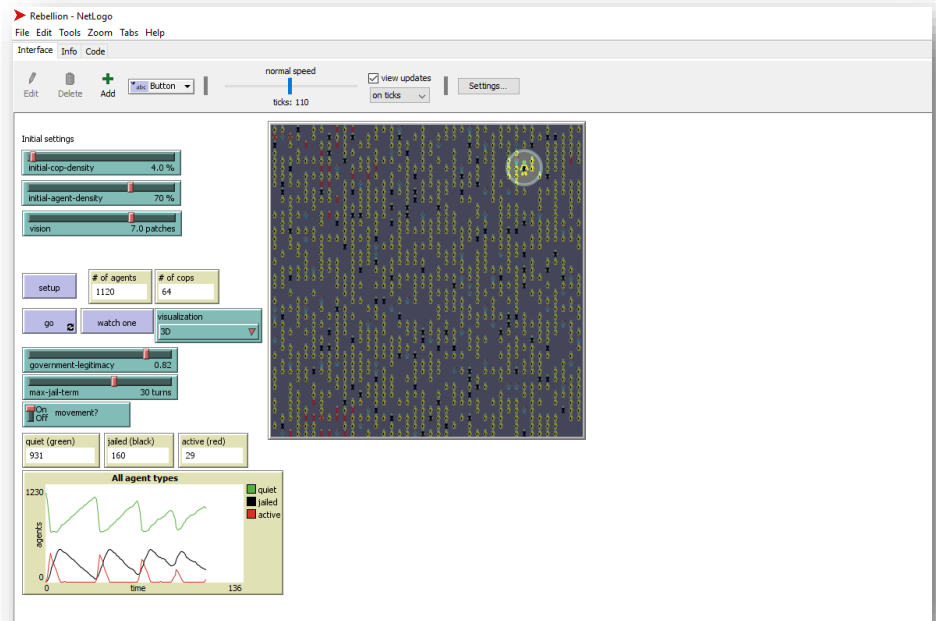
Kaj on Assembly

- Scope
- Appropriateness
- Resolution
- How complicated (“complex”) is it?
- Parsimony
- Was the model useful?



Martine on Rebellion

- Scope
- Appropriateness
- Resolution
- How complicated (“complex”) is it?
- Parsimony
- Was the model useful?



Oil Cartel?

- Everyone with a local install of Netlogo:
 - Connect to RandomNet via Wifi
 - Password: IDigHist!
- Open “Hubnet Client” and login to the game
- Choose a strategy
 - **“Agreement” Strategy:** Always produce and price exactly in accordance with the cartel agreement
 - **“Quota-Plus” Strategy:** Produce a little bit more than the quota and offer the excess amount to the market for a price a little less than the agreement price. (The additional amount produced is set by the “extra-output” slider.)
 - **“Quota-Minus” Strategy:** Produce a little bit less than the quota and offer it to the market at the agreement price. (The amount less is set by the “reduced-output” slider.) A member might do this in an effort to keep prices up and the cartel together.
 - **“Price > MC” Strategy:** Keep producing and offering additional output as long as the price you have to offer to the buyers in order to sell that unit is still higher than the cost to produce it.
 - **“Flood Market” Strategy:** Saturate the market with low cost oil to punish or send a warning to cheaters.

Netlogo as a programming language

- Logo languages (sixties)
- Procedural
 - leans to Object-Oriented implementations
- Netlogo Code is a series of “procedure calls” (to ... end)
 - Can contain if statements, loops, etc.
- “Turtles” (like objects):
 - Variables (“turtles-own”)
 - Are subject to primitives run in procedures (“ask turtles [set pcolor black]”)
- Globals
 - tick



Python :

Object (Classes) have variables and functions

```
class MyClass:  
    i = 12345  
    def f(self): return 'hello world'
```

Netlogo: procedures acting on objects

```
turtles-own [energy]  
  
to setup  
    clear-all  
    setup-patches  
    setup-turtles  
    reset-ticks  
end  
  
to setup-turtles  
    create-turtles number  
    ask turtles [ setxy random-xcor random-ycor  
    ]  
end  
  
to eat-grass  
    ask turtles [  
        if pcolor = green [  
            set pcolor black  
            set energy (energy + energy-from-grass)  
        ]  
    ]
```


Let's create the tutorial model! (30 mins)

<http://netlogoweb.org/>

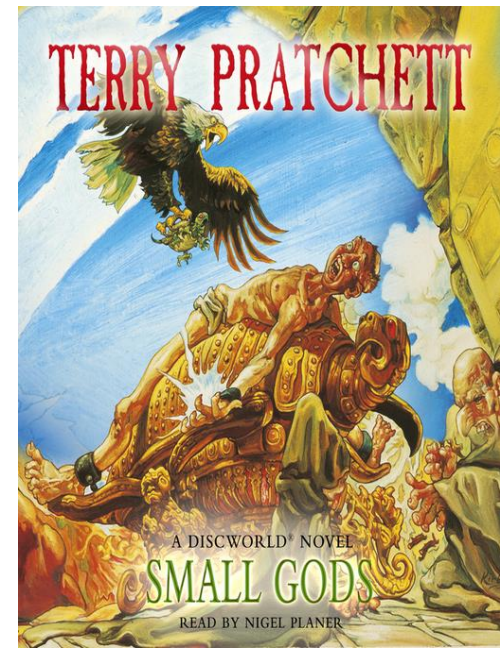
<https://ccl.northwestern.edu/netlogo/docs/tutorial3.html>

(google netlogo tutorial 3)



Done this already? Try and add another grass eater to the mix that behaves differently from the turtle (e.g. moves slower; gets more energy from grass) or... better yet: a predator that eats weak turtles

Don't expect to be done with this in half an hour, but still... try and learn!



Population Modelling

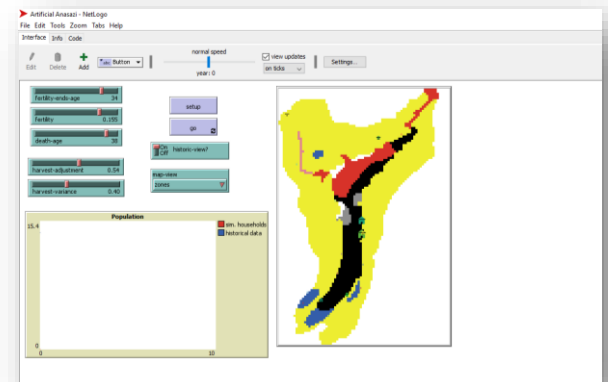
- Artificial Anasazi
 - Ancestors of the Pueblo peoples
 - Anasazi means in “ancestors of our enemies” in Navajo
 - Large populations, rich ceremonial and material culture
 - Major population dispersal, movement to south and group fissioning in 13th century.
 - Did population displacement arise from environmental factors?
 - Model: no
 - Behaviorspace (many iterations)
- Alternative hypotheses



Chaco Canyon's Great Kiva

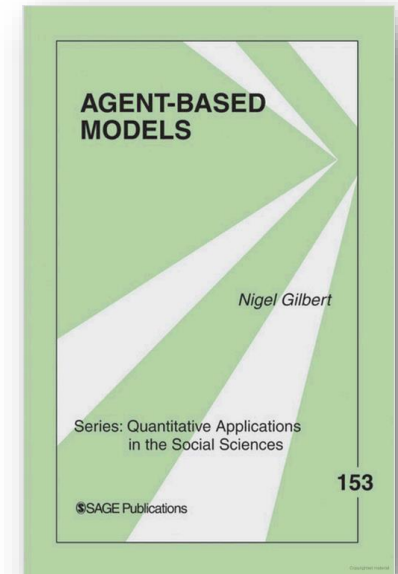


Chaco Style Bowl



ABM: A few take-away points

- ABMs are seldom the end of an inquiry, but can be a start or intermediate check.
- Evolutionary framework
 - Emergence of a system through time
- Good way to explore how single agents and their decisions can affect systemic change
 - Structuration theory, Annales school, complex systems
- Force formalization of complex questions in “simple factors”
 - Pre-supposes rational agents
 - Match perception of agents? Very “Etic”, numbers-driven
- Netlogo is a great start, but do check out other modelling frameworks:
 - [Mesa](#) (Python)
 - Extensive list on [Wikipedia](#)



Presentations

- Two classes: 9 and 16 May
- Hand in at start of class on Wednesday 9!
 - Randomly decided who will present when
 - Let me know if you can't make it on either days
- 10 minutes talking, 5 minutes for feedback/question/handover
- Presentation contains:
 - What is the inquiry?
 - Literally: spell out the guiding question!
 - Context of the inquiry?
 - What is/are the digital approaches you employ?
 - Why?
 - How?
 - What is the public-facing aspect of the project?
 - Intended audience
 - Dissemination?
 - Current project status
 - Planning
 - Challenges encountered/foreseen
 - Solutions found/feedback sought
 - Take-aways
- Don't forget to give feedback/ask questions of others!

