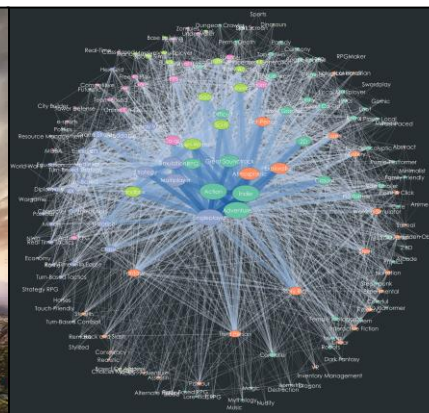# Digital Approaches to Historical Inquiries
9th Class

Assignment 6

- <u>Due on April 10</u> (in two weeks)
- Analyze your own (or mine) Facebook network data using [Lost Circles](#)
- Import the data-set in visone
- Identify the top 5 most central actors using at least two different centrality measures
  - Visualize and explain the measures
  - If personal network: discuss the results from your perspective (keeping in mind anonymity/personal privacy)
  - If my network: provide a discussion of the position of my 5 most central nodes (and, if you like, provide your own guess as to what social role in my life they fulfill).
- Is time present in this flat network? How?
- Does geographic space factor into your network? How?
- Export the visualization(s) of your network (e.g. .png or PDF) and provide a max 700 word report that discusses the outcome of your centrality measures and temporal/spatial dynamics acting on your network via Slack.
- Bonus points if you can connect your own findings to specific network theories (e.g. small worlds, structural holes, weak ties, "robust action", et cetera).

Pepijn
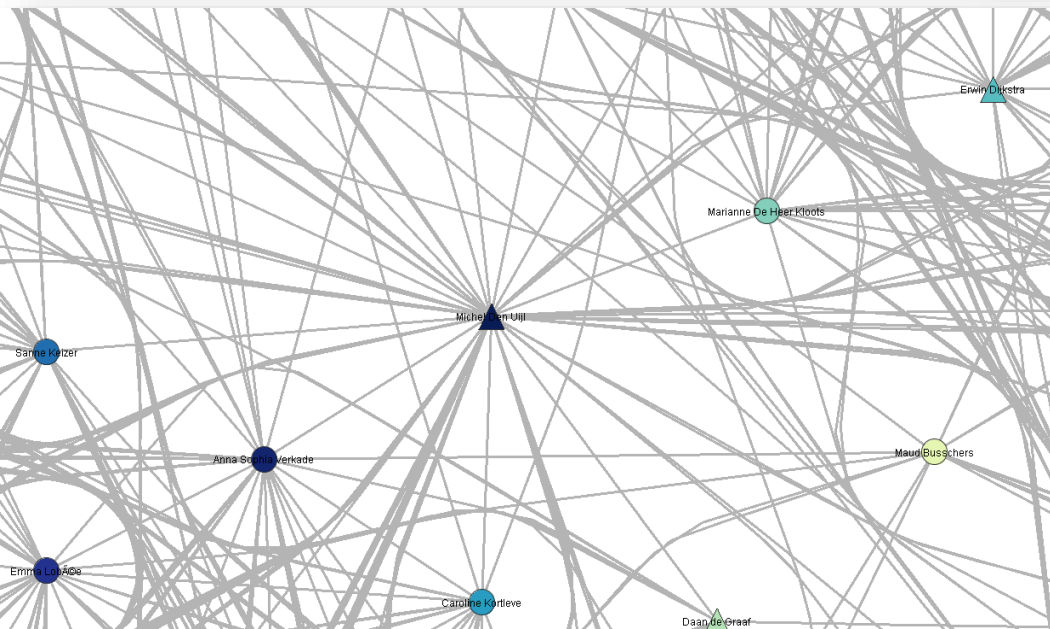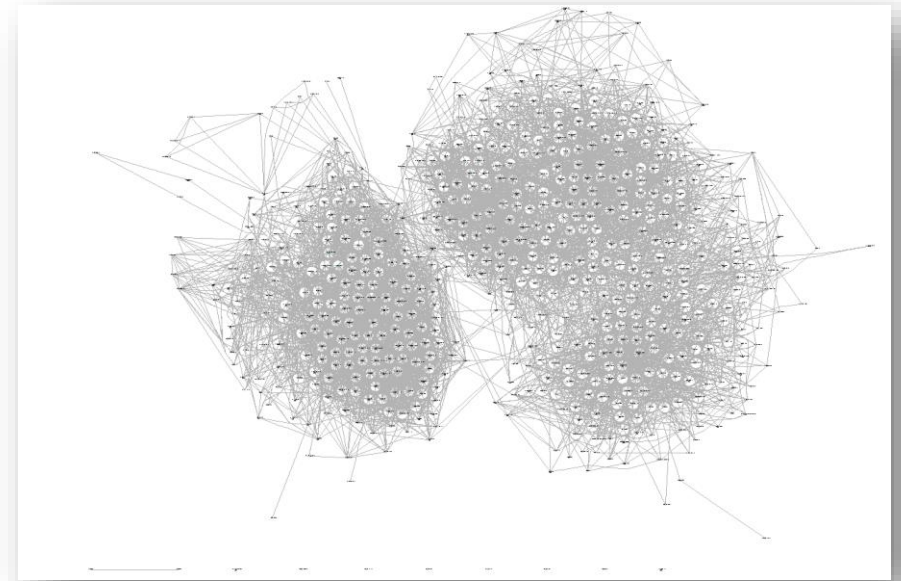
| Name	Degree (percentage)
Michel den Uijl	0.569
Dirck Camphuysen (High School account)	0.567
Anouk van Hasselt	0.556
Maaike Reinhoudt	0.519
Mark Lonissen	0.504

On my network and Facebook

- Femke:
  - "If you are not paying for the product, you are the product"
  - Since the data is anonymized it is hard to put its outcome into perspective.

- Max:
  - If Mr. Mol posts something on facebook it will probably take more time for the outlying nodes to pick up on this particular post ,because they are not as interconnected as closer lying nodes.

- Wouter:
  - For this assignment, the data about the facebook network of the tutor was used, as my own Facebook account had been deleted several days before the assignment due to the Cambridge Analytica scandal.
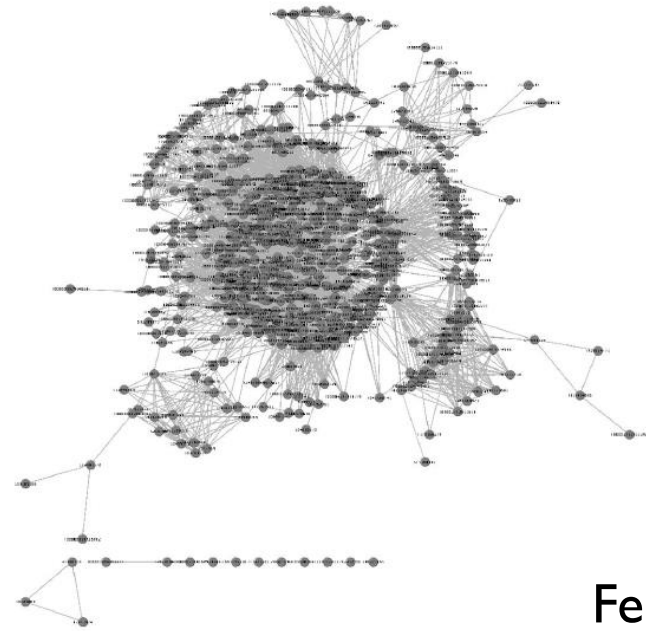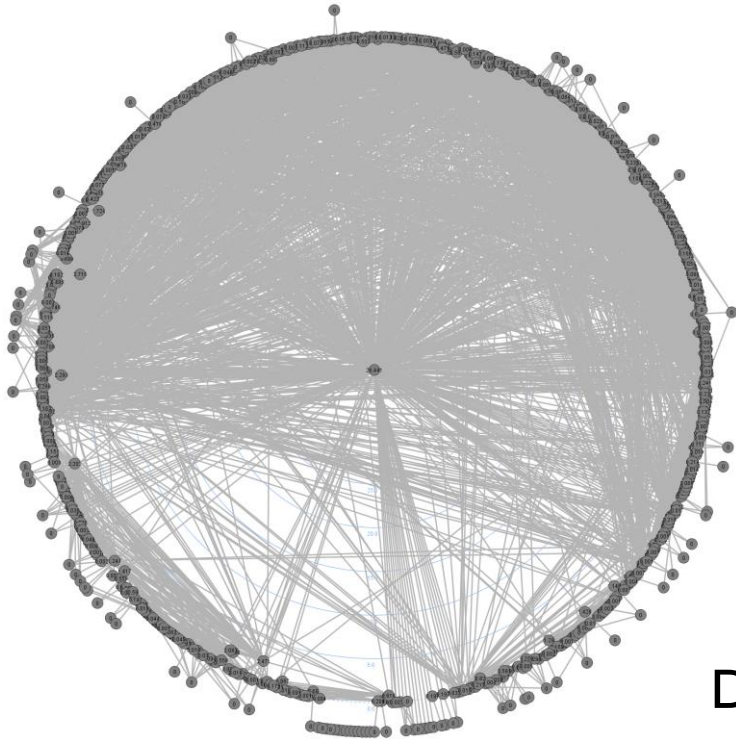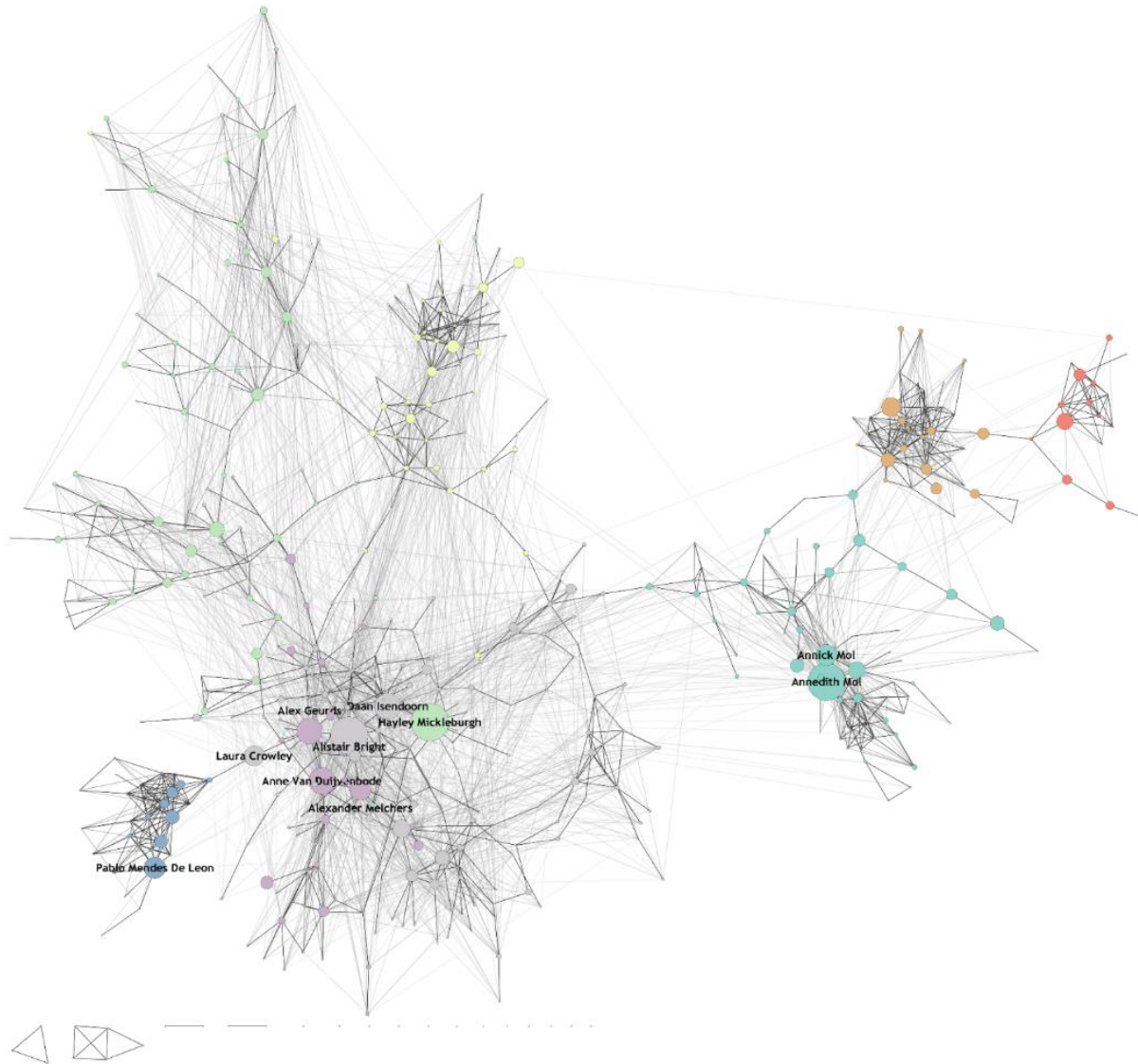
Rosa
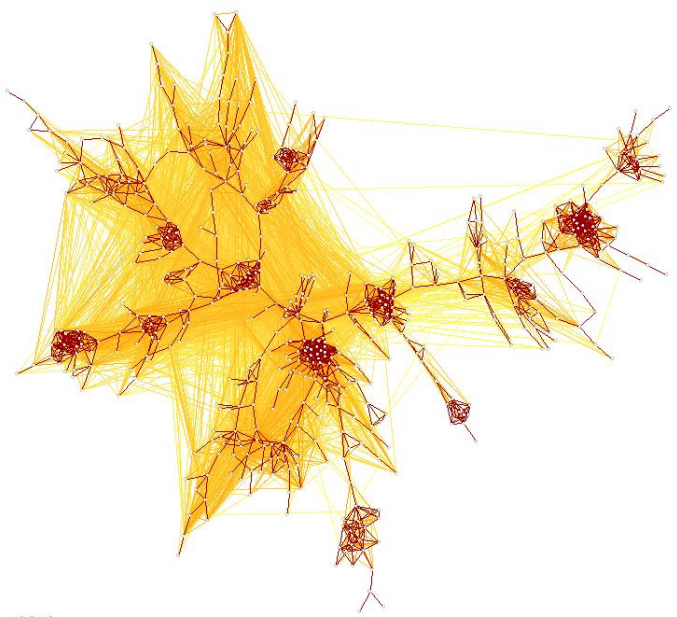
Layouting:
My network

Femke

David

My network

| Rank	Name	Type
1	Hayley Mickleburgh	Partner and colleague
2	Annedith Mol	Sister
3	Alistair Bright	Friend & Colleague
4	Anne v. Duijvenboden	PhD student, friend of #1
5	Daan Isendoorn	Friend & Colleague
6	Alex Geurds	Mentor
7	Pablo Mendes	Co-student and sports team
8	Annick Mol	Sister
9	Alex Melchers	Co-student
10	Laura Crowley	Friend

Ego-network

1. Choose an Ego
2. Only include those nodes with which ego has a direct relation (alter)
3. Tie all nodes that are also in direct contact with each other.
4. Remove Ego (and therefore all ties of ego with alters)
5. Betweenness Centrality

1, 2, 3, 4

Ego
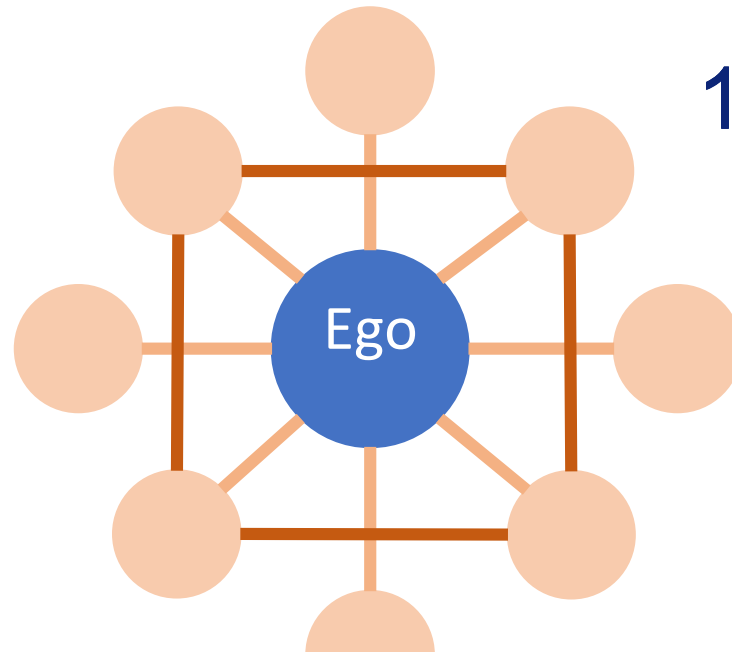
Complex Systems: Crowd-movements

- How do crowds move out of spaces?
  - Phenomenon in which people self organize (or not) based on a given set of behaviors ("want to get out ASAP"), their interactions with others (cannot move through others), and their environment (layout of the space)
  - Real life use: e.g. evacuation, controlling flow in buildings
- Real life experiment in 2013 by Jülich Forschungszentrum
- Cameras were filming about 1000 individuals with QR codes stuck on their heads moving through a space
- Results in PLOS One ([link](#))
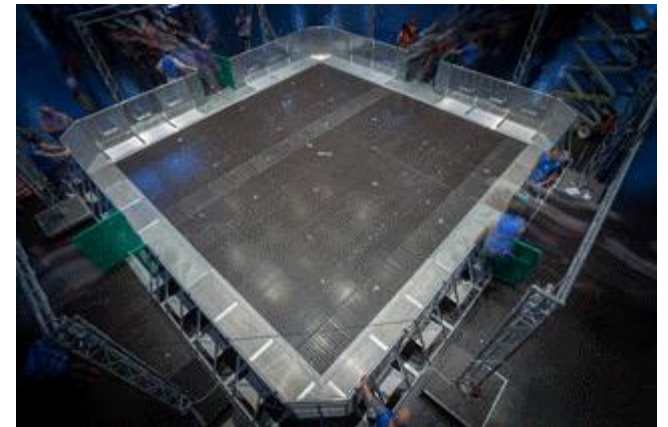
Agent-Based Models ([Macal and North 2010](#))

- [Crowd movements as ABM](#)
- A class of modelling focused on autonomous 'agents' ("micro-level" entities)
- Agents have behavior
  - Behaviors (can) have parameters
- Agents (can) have interactions
  - Agents can have ties
- Agents (can be) influenced by environment
  - Agents can influence environment
- Diversity of effects creates an emergent system
  - Looking for working ones ("self-ordering")
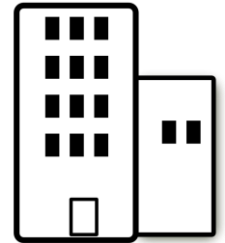
Why is ABM-driven simulation useful for historical inquiry?

- Temporal: Very good at modelling (evolutionary) processes
- From micro-scale behaviour to systemic effects
  - Agent vs. Structure
- Interfaces with the multi-discipolinary field of complexity science
- Simulations are an opaque thought experiment.
  - From fuzziness to formalization
  - Repeatable and falsifiable!
- Simulations can be surprising
  - make us re-consider cherished believes about the past (Romanowska 2014)
- We may have a theory, but we may only have second-hand observation, incomplete data, and coarse-grained inferences (Rogers and Cegielski 2017)

Emulation

Exploration

- Realistic, mega models
- Goal: hypothesis testing
  - How closely do behaviors match empirical data
- Reproduce high-level patterns computationally

- Elegant, heuristic models
- Goal: Theory building
  - Modelling simple behaviors generates theoretically derived expectations that can be tested with empirical data
- Investigate "lower-level components"
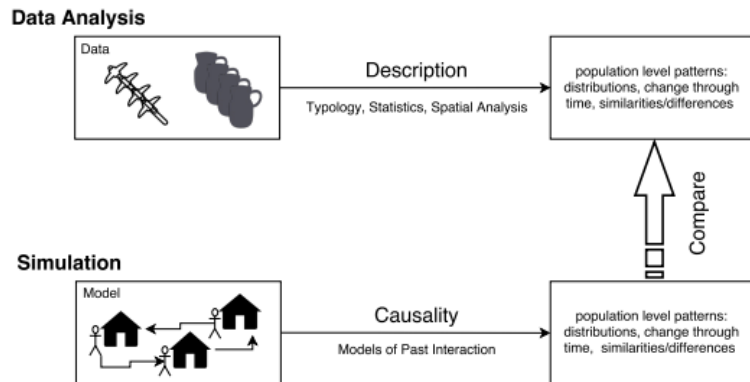
What-if histories!

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?

# Let's Play! The Evolution of Trust by Nicky Case

http://ncase.me/trust/

Take 20 minutes to play this game and evaluate it as an agent-based model
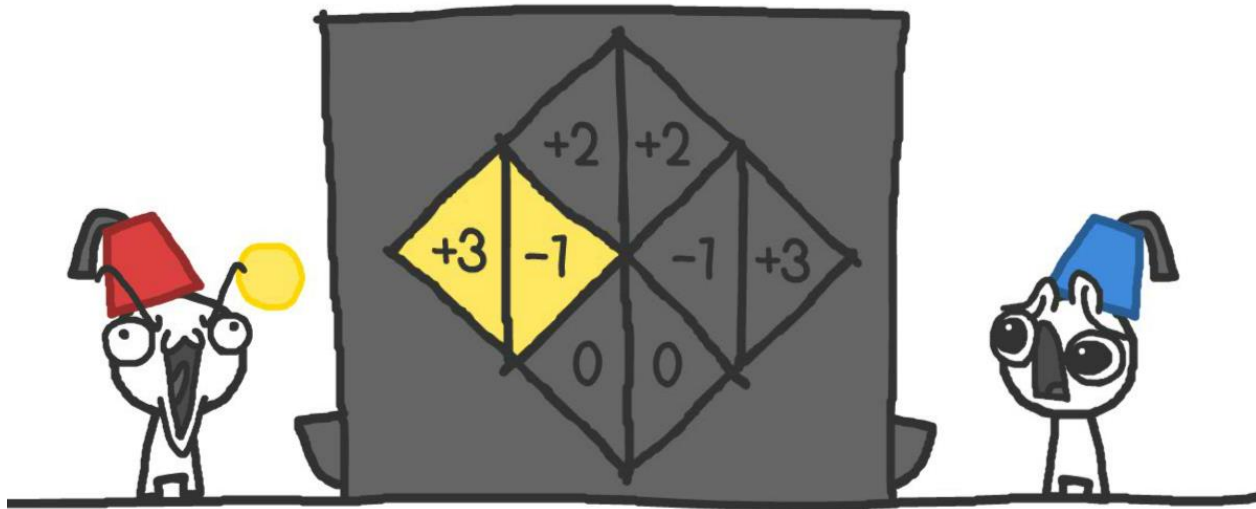
Netlogo

- Developed by Uri Wilensky in 1999
- Free, open source
- Interface, Model Info, Code fields
- Visual
- Fully programmable, based on Logo language
  - Relatively easy to pick up
- Additional features: plugins, hubnets, behaviorspace, 3D, headless mode, browser-based
- Large collection of models for many different fields, including the [Prisoner's Dilemma](#)
  - In Netlogo
  - Other repositories
  - In the "wild"
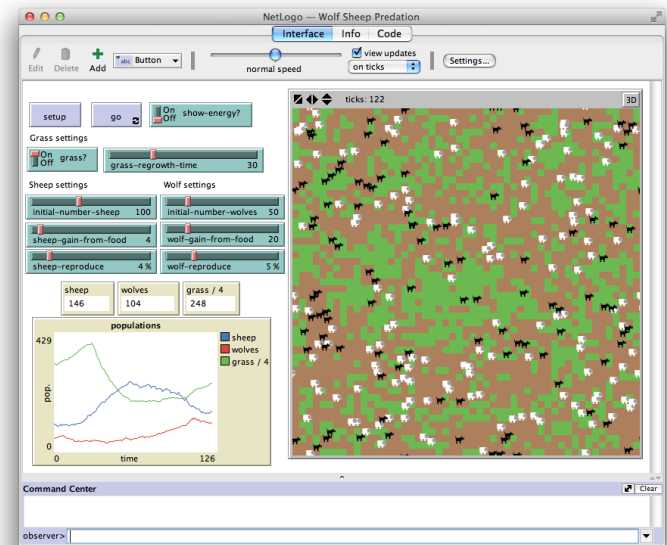
Netlogo vocabulary

"The observer is filled with turtles on patches, linked together"

- Oberserver = "model window"
- Agents = Turtles
- Patches = environment
- Links = ties

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.

See you next week!

Survey is still live.

Please take the time to fill it out before end of this week.