## 1. Purpose

*Question*: What is the purpose of the model?

## Analyze how bias evolves in time in a group of agents, considering the influence of personal or close experiences and the predisposition of the individual on the perception of objective statistic data.

## 2. Entities, state variables, and scales

*Questions*: What kinds of entities are in the model? By what state variables, or attributes, are these entities characterized? What are the temporal and spatial resolutions and extents of the model?

The agents that participate in the model are:

**Citizens:** They are connected to fellow citizens through links that represent the closeness they have with them. They have the following characteristics:

-On/off status.

-Predisposition: How much external information affects current opinion. Can be positive, negative or neutral.

-Memory: They will remember to some extent information about past rounds

-Current opinion: Is calculated having into account information received from other nodes this round, the official (global) statistic data, memory, and predisposition. Opinion can saturate (has maximum value).

**Social Links:** They represent the social connection between agents. They have different levels of intensity.

**Global variables:**

-Off rate: probability of a currently “off” citizen to turn “on” that round.

-On rate: probability of a currently “on” citizen to turn “off” that round.

-positive/negative/neutral initial distribution rate for predisposition.

-official global statistical data of the current situation. (Real information)

## 3. Process overview and scheduling

*Questions*: Who (i.e., what entity) does what, and in what order? When are state variables updated?

## Each round, the following things happen:

-It is decided if any citizen changes status

-It is decided which social links are “active”.

-Information spreads through active links. “cada nodo recopila info de su sub grafo”

-Citizens calculate their opinion that round. “opinion: valor que sigue una formula que viene dada por el profe

-Global variables change.

## 4. Design concepts

*Emergence*. What key results or outputs of the model are modeled as emerging from the adaptive traits, or *behaviors*, of individuals?

We are expecting a non-linear relationship between the actual average status and the perceived one.

*Sensing*. What internal and environmental state variables are individuals assumed to sense and consider in their decisions? What state variables of which other individuals and entities can an individual perceive; for example, signals that another individual may intentionally or unintentionally send?

Nodes calculate their opinion each round based on:

-Own status

-Personal predisposition.

-Global data. “ratio estado de nodos”

-Memory. “int de 0 a x”

-Information from other nodes.

Possible formula for opinion:

Perception=alpha\*(active network information) + Predisposition value +”noise” noise = sumar valor aleatorio.

*Interaction*. What kinds of interactions among agents are assumed?

The intensity level of the links is modeled as a probability of activation each turn, representing the probability that two nodes will contact each other in a period of time. The node will have access to every other node on the “active” sub-network the node belongs.

*Observation*. What data are collected from the ABM for testing, understanding, and analyzing it, and how and when are they collected?

The initial data we want to analyze and compare is the real status percentage of nodes with the perceived percentage.

## 5. Initialization

*Questions*: What is the initial state of the model world, i.e., at time *t* = 0 of a simulation run? In detail, how many entities of what type are there initially, and what are the exact values of their state variables (or how were they set stochastically)?

Initial conditions will be random in the way agents are connected and the distribution of predisposition. Depending on the method to calculate opinion for each agent, we may need to crate “artificial opinions” for the first round.