



Hipsteritis

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Problem A

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Problem Summary

Problem A: Group Affinity and Fashion Sense

How do people decide to adjust to the expectations of other people in the group.

Examine the propensity for a person to alter their appearance and conform to particular expectations.

History and Rationale



Gideon Lichfield ✓
@glichsfield

A few days ago we ran a piece in [@techreview](#) about some research purporting to explain the "hipster effect"—the fact that nonconformists often end up nonconforming in the same way. We used a stock Getty photo of a hipster-ish-looking man. technologyreview.com/s/613034/the-h...



The hipster effect: Why anti-conformists always end up lookin...

Complexity science explains why efforts to reject the mainstream merely result in a new conformity.

technologyreview.com



Gideon Lichfield ✓
@glichsfield

In other words, the guy who'd threatened to sue us for misusing his image wasn't the one in the photo. He'd misidentified himself.

All of which just proves the story we ran: Hipsters look so much alike that they can't even tell themselves apart from each other.
/ENDS

Assumptions

- Static Population
- Individuals influence their nearest neighbour the most
- Physical and digital influence is equivalent
- Every individual in a population is influenceable
- N value in our heat equation is set to be one, so each location x would be occupied by one individual
- The coefficient on our heat equation is 1

Modeling Techniques

SIS

- Susceptible Infected Susceptible Model
- Originally used to model diseases

Social Thermal Dynamics

- Heat Equation
- PDE

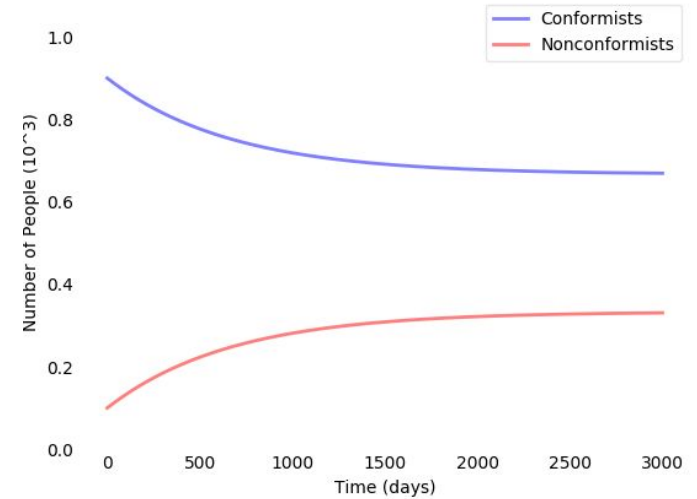
SIS

Modified SIS model

$$\frac{dC}{dt} = -\beta \frac{C}{P} + \gamma \frac{N}{P} \qquad \frac{dN}{dt} = \beta \frac{C}{P} - \gamma \frac{N}{P}$$

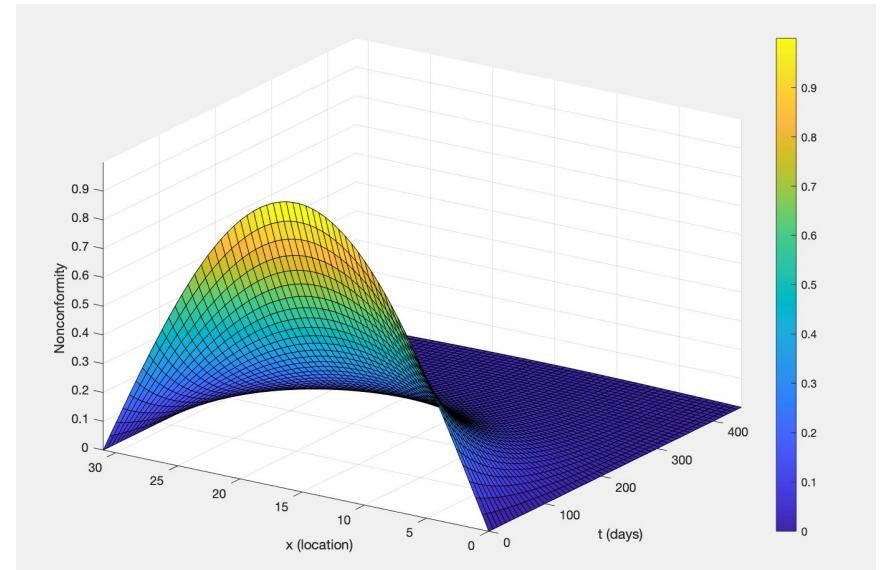
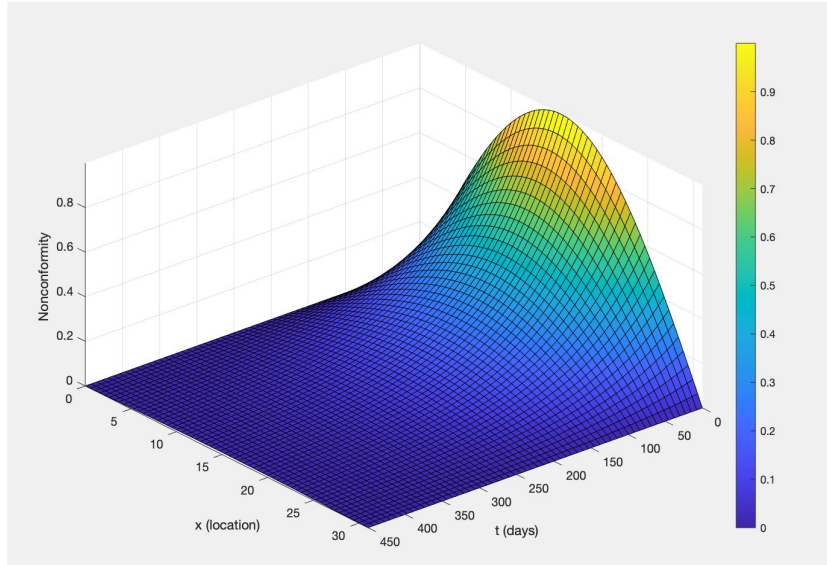
$P = C + N$	Total population
C	Population of conforming
N	Population of nonconforming
β	Rate of converting to nonconforming
γ	Rate of converting to conforming

Figure 1: SIS Model



N

Social Thermal Dynamics



$$U(x, t) = \sum_{n=1}^{\infty} A_n \sin\left(\frac{n\pi x}{L}\right) e^{-\left(\frac{n\pi}{L}\right)^2 kt}$$

$$\frac{\partial}{\partial t} U = K \Delta U$$

$$U(x, t) = \sin\left(\frac{\pi x}{L}\right) e^{-\left(\frac{\pi}{L}\right)^2 kt}$$

$$\lambda_n = \left(\frac{n\pi}{L}\right)^2, \quad n = 1, 2, 3, \dots$$

Conclusion

Social movement stabilizes

SIS model feeds the initial conditions of the heat equation

Nonconformity values converge in heat equation

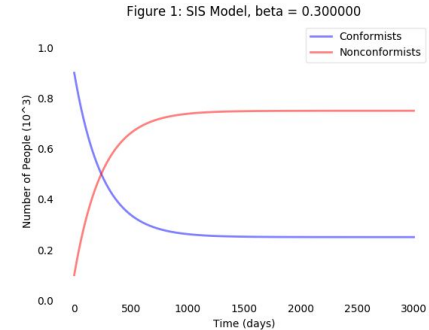
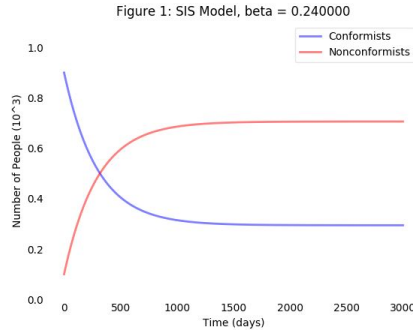
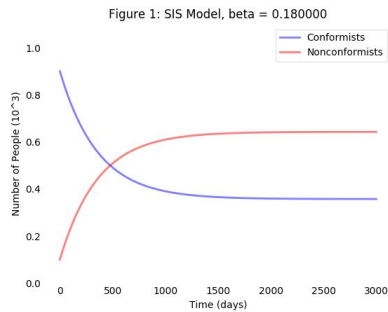
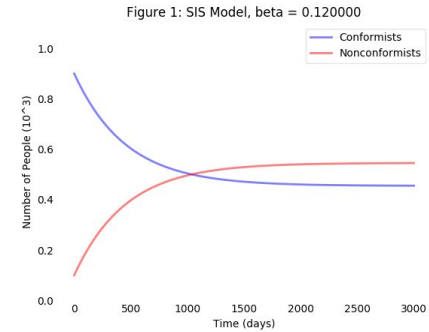
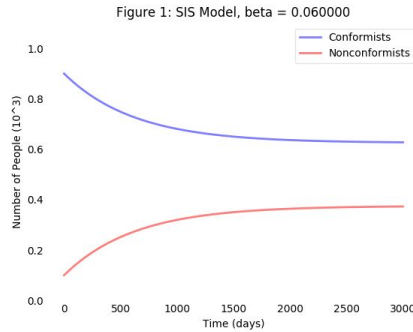
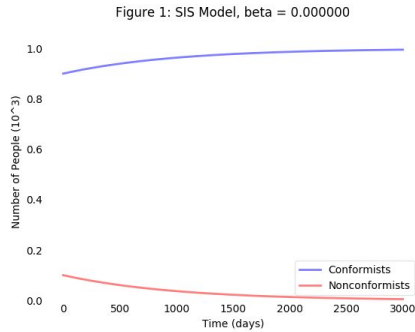
Takes 450 days for all hipsters to look alike

Additional Issues

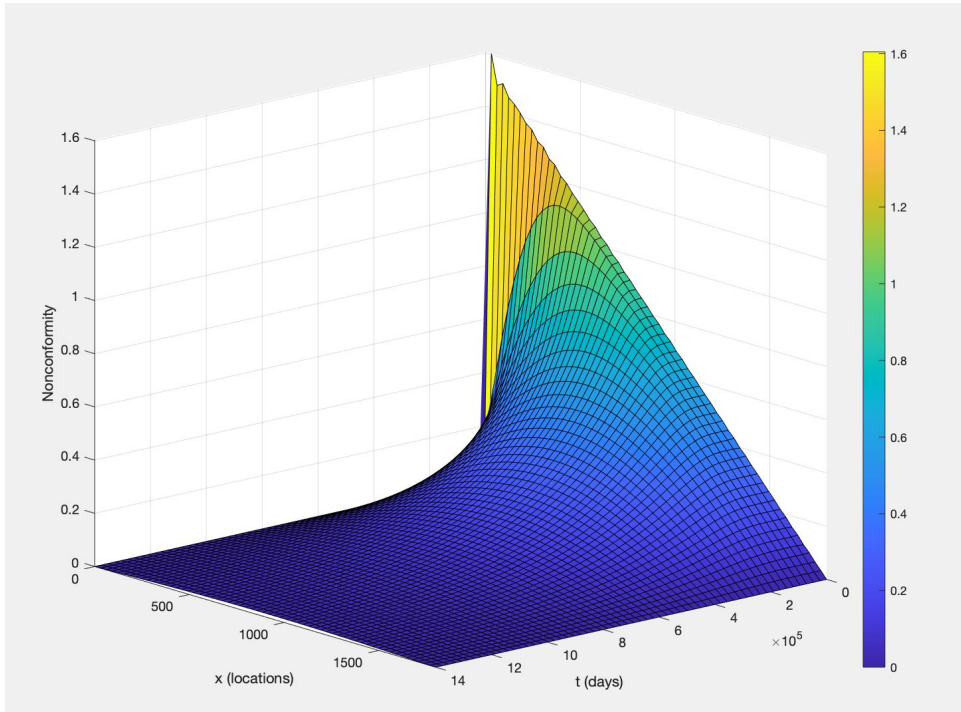
How does your model depend on the initial condition? For example, will it always behave the same or is it possible to determine an initial condition that will yield a different end behavior? What does your answer to this question indicate about this model?

Additional Issues: SIS Model

Sensitivity analysis on beta, the rate of converting to nonconforming



Additional Issues: Heat Equation



$$U(x, t) = \sum_{n=1}^{300} A_n \sin\left(\frac{n\pi x}{L}\right) e^{-\left(\frac{n\pi}{L}\right)^2 kt}$$