Social Networks
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Lecture – 55
Homophily (Continued) & Positive and Negative Relationships
Spatial Segregation: Simulation of the Schelling Model

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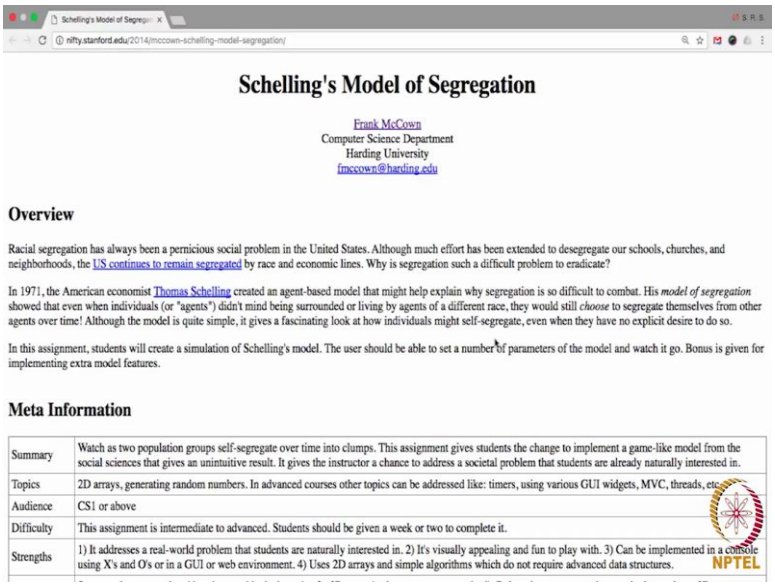

So, here is a website that I have opened, it has a very nice animation of the concept, it is by Frank McCown as you can see it there is a beautiful description of the model and a very nice simulation of the module as well.

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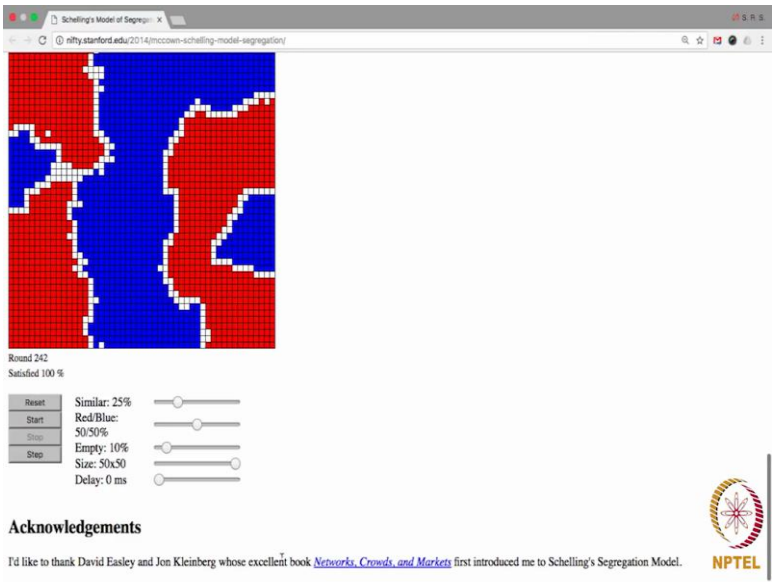

If you can see in the acknowledgement in fact, the creator of this simulation acknowledges the text book that we have we are using for the course network stores in markets, alright.

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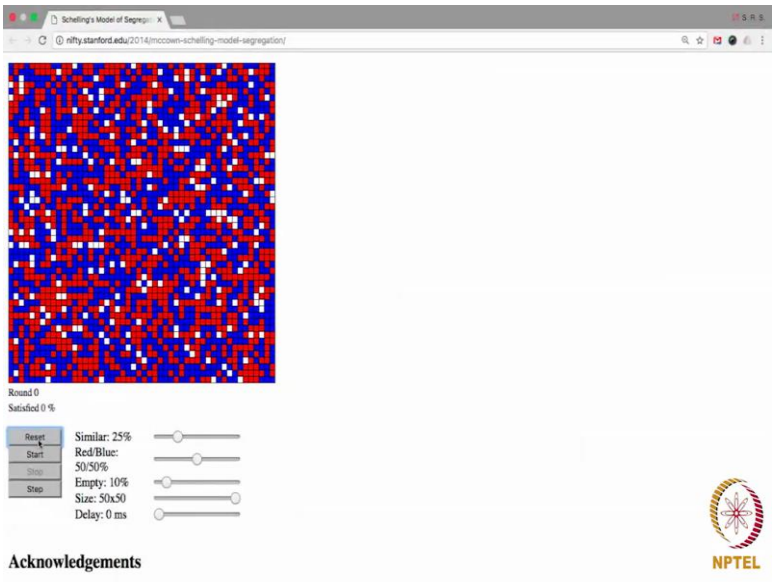

So, here is the simulation facility let me hit the reset button and as you would have guessed that red and blue here denote 2 different types of people who have populated this city and white represents blank where anybody can shift. So, here have some parameters

which are again, which are again quite self explanatory all though I will try explaining them for you.

So, this is this time for how similar do you expect the how similar do each node expect their neighbours if I put 25 percent here it is the t value that I explained just now, the t value I say t = 3. If its 25 percent I am surrounded by as you know 8 people 25 percent of 8 people is how much - 8 * 1/4 which is 2. So, if any person has 2 neighbours of the same colour then he is deemed to be happy and satisfied he will not shift and anyone who is not surrounded by at least 2 people of the same colour that person will try to shift to a blank space. And the rest is the distribution of red and blue it is the same when I say 50-50 you can in fact change it. Empty space I have kept some ten percent you can in fact, change these 2 sizes is 50 ka 50 grid delay is the delay between 2 steps of the animation I have kept it is 0.

So, let me reset it once again and then let me start the simulation as I start you will see that the number of people who are satisfied will be displayed here as of now nobody is satisfied it says 0 percent people are satisfied which means nobody is surrounded by at least 25 percent of people who are happy. Now basically once you start the animation only this will start counting as you can see I hit the start button and you see 100 percent people are satisfied it took just 8 rounds as you can see every single person is surrounded by at least 2 neighbours of its type. That is the similarity percentage that I gave t equals basically 2 now it will make t equals 4 which is 50 percent out of 8 people who my know I would expect half of them to be of my type if the reset and then start the simulation and see the beautiful convergence of segregation that happens here right now.

I hit the start button now please observe look at this they are getting segregated and you see there is some beautiful segregation happening here right. Then you expect half the people to be of your type you observe segregation happening right let me try increasing it all the more reset and increase this to let us say 75 percent what you expect now whether lets pause for a minute and then see what I am doing here I am saying 75 percent of my neighbourhood should be of my type which means if you take a blue red cell here I should have at least more than what is 75 percent of 8 neighbours it is 6. This red person should have 6 people surrounding him only then he is redeemed happy otherwise you would want to shift which means as you can see none of them are happy here, right. Let me start the simulation and see what happens.

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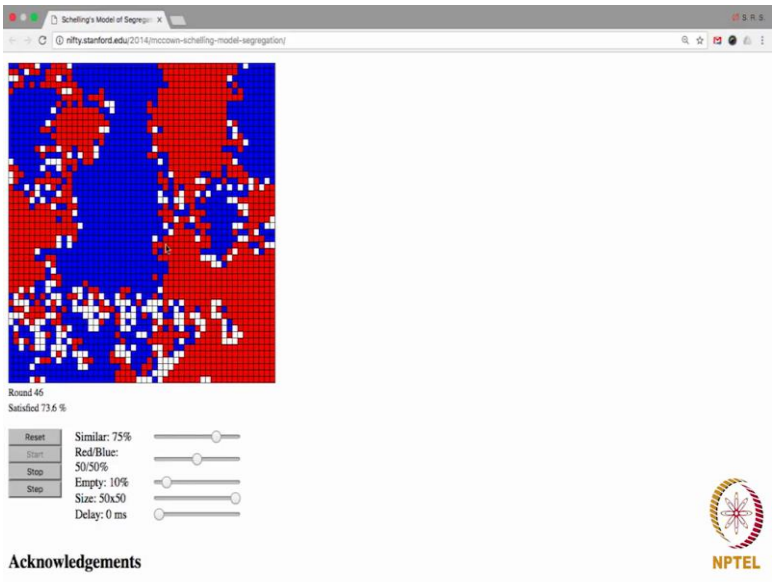

See, they are now moving to the empty spaces now roughly if 50 percent of the people are happy and then it goes on and on look at the beautiful segregation that is happening.

See more and more people get segregated and there are clusters that are emerging you see of huge blue cluster here and a red cluster here and you see 80 percent people are happy you see the stick more and more correct you see that is the segregation is beautifully going towards 100 percent. Now very soon you will see all of them are happy as you can see the number of rounds here in this case when similarity percentage is high when t is high seems to take a lot of time. You see the some problem in the boundary now with converges beautifully you see there is basically simply three clusters cluster 1; I am sorry 4 clusters cluster 1 cluster 2 cluster 3 and cluster 4 of course, you have clusters here as well, but I think we can ignore it, right.

So, basically there are 4 big clusters. So, the simulation says that more the similarity that you expect better is the segregation. If you actually I am sure you would know what we can guess what will happen if I make it 89 percent it will probably take a long time, but let us see what happens from here.

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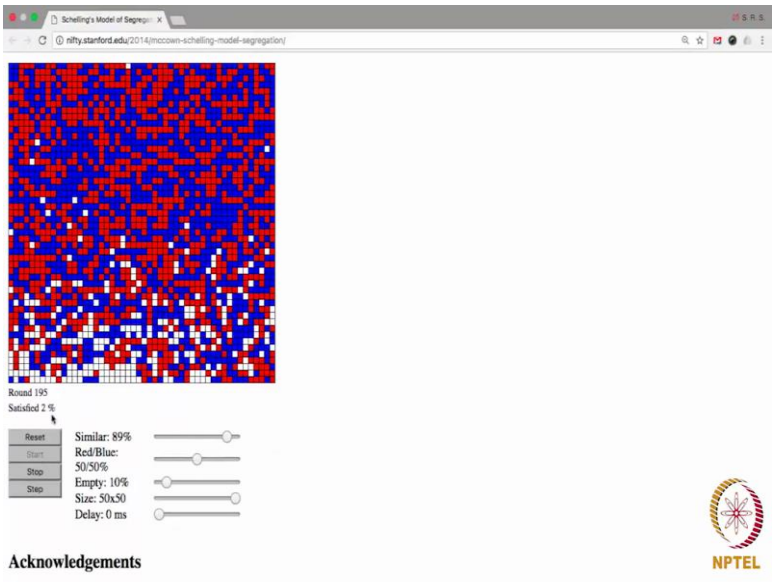

You see you see the people become less and less satisfied because 89 percent is what it is not achievable as you know 89 percent is more than 7 people should be of your type I mean that is not possible right not even more than 7 almost 8 people all your neighbour should be of your type that is not possible. So, it is a sort of simulation gets confused this might even go forever.

So, if you sort of reduce it you will observe that the convergence happens very quickly. Reset start for 30 percent which very quick yeah thanks to the create of this simulation we can explain this very easily with the simulation than verbal explanation, also it is interesting to note that the people have not understood this mathematically really well how exactly this happens how is it a function of this similarity percentage and how does the clustering combined although it is common sensical, but the exact mathematical details of it is not very well known.