The Spread of Gang Activity in a Typical High School

New Mexico

Supercomputing Challenge

Final Report

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Team 97

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Executive Summary

We, Team 97 of Miyamura High School, have chosen to investigate the problem of how youths get involved in gangs, and what can be done to reduce the problem. One of the main reasons that youths join gangs is the influences that they get from their family and peers. In our research, the influences are what drive the youth to join gangs. People that are in gangs will come to others, and try to influence them to become gang members, not knowing what they are getting into. When youths get into gangs it is also because they have nothing else to occupy their time. Sometimes they try to find a place where they are wanted and cared about. If youths were given more positive influences and extra-curricular activities, they would not feel the urge to join a gang.

To find a solution to the problem and see how people might react to certain situations, we may put the total number of students at twelve-hundred, and have the influences of positive and negative equal to each other. We will see how the students will interact with each other, and see how the influences will affect the students' behavior. With the outcome of how the students interact with each other, we can study the outcome. If the outcome had shown that most of the students were involved in gangs, we would then know the impact of negative influences.

Using a model similar to the one we have created, we can see what can be done to help youths stay out of gangs, how some youths might interact with each other, and how some are involved in gangs. The influences that are put on youths affect how they behave, and what path they may follow. How big the influence is, being negative or positive, can affect the way youths think of what they are doing or involved in.

Background

Gangs have been around for years in America, and they have caused problems to people by way of thievery, killing, and drug dealing. Gangs have stolen from others' homes and also from stores. They have also stolen items such as cars, money, electronics, and personal materials. The things they steal are sold to people to make money for themselves. Gangs have killed people in other rival gangs or innocent civilians who are not involved and minding their own business. Gangs also take and sell drugs to youths. The drugs could ruin the lives of the youths and their families.

Gangs have affected all fifty states in America, and they can affect youths as young as nine years old. The age where most gang activities take place is from ages nine to twenty-four years of age. At one point in time gang activities had decreased by sixteen percent between the late 90's to 2001. In 2001, the gang activity began to rise, than it stabilized to where it would fluctuate. Overall, from 1996 to 2011, the gang activity had declined.

People get involved in gangs when the community is poor and people living in poverty. Some things that could contribute to this are poor school conditions, poor families, and low economic systems. This means when school is not conducive to teaching where they should be, students will try to find a way to survive. The school may not have activities that other schools have, and this could lead to youth joining gangs. When families are not close or there is not much care, one could go find a place, or people, who will care for them such as gangs. When the economic system is down, youths may join gangs to make money for their family by stealing or selling drugs.

Statement of the Problem

Gang membership has increasingly been affecting several high school students in a negative manner. Youths get involved in gangs at an early age due to lack of guidance. As a consequence, the gang members who have grown up in the gang life struggle to make a living. The options that seem to work for them are stealing and drug dealing which can affect their demeanor and the communities in which they live.

In a typical high school, there are activities for students to participate in and guidance counselors who they can talk to; these activities are considered safe havens and therefore reduce the influence that gangs have on the student body. Our goal is to observe how youth gang members would interact with other individuals and influence them to become members or get out of the gang life. We are using the NetLogo program to create a model to show how the students' behavior can be affected by other students who may be involved in gangs. We want to see how gang influences might affect a high school, how the student body might get affected by gang influence, and how gang influence spreads throughout a high school over time. These are the three things that we are hoping to quantify in the data that we receive from running our simulation.

Method

We gathered data from the discipline office and calculated the total number of students that were involved in fights, possession of weapons, and gang-related activities (aggressive confrontations and misbehavior). Due to student confidentiality, we had to assume that each of these factors was done by a new individual; meaning to say we did not know if a student involved in one thing was also involved in a different gang-related incident. We also acquired the total population of students in a typical high school in New Mexico, and with this population we added the data we received from the discipline office.

We used the data to determine the initial gang influence in the school. That number, 13%, was used as the initial gang members in the setup procedure. We created three sliders for the links which represent friendships and peer-to-peer relationships. As the sliders increase there is a greater pull between each turtle and their "friends". Changing the values in one of the sliders changes how closely grouped the whole school is. The other two sliders determine the maximum number of friendships a student may have and the length of time they last. The final main slider, world influence, changes the size of the white and blue cubes. These cubes represent positive and negative influences respectively in terms of the world the turtles are in. In reality, the white cubes would represent after school clubs, activities, sports, as well as counseling. The blue cubes would represent gang influences from family, friends, and other factors we cannot measure.

Results

World Influence	secondary links	200 ticks		400 ticks		600 ticks		800 ticks	
		students	gangmembers	students	gangmembers	students	gangmembers	students	gangmembers
	0	1017	183	1003	197	1004	196	1019	181
	1	999	201	1017	183	1012	188	1000	200
	2	1006	197	1006	194	1008	192	997	203
	3	1001	199	997	203	979	221	1043	177
10	4	984	216	1006	194	990	210	1017	183
	0	1021	179	1019	181	1014	186	997	203
	1	980	226	945	205	991	209	995	205
	2	999	201	1001	199	1002	198	1004	196
	3	991	209	1005	195	1003	197	1011	189
5	4	1004	196	987	213	1011	189	1015	185
	0	1025	175	1031	169	997	203	1018	182
	1	1015	185	986	214	1003	197	1013	187
	2	1024	180	1006	194	1026	174	986	214
	3	1006	194	1014	186	1010	190	1010	190
0	4	999	201	1017	185	999	201	996	204
	0	1004	196	995	205	997	203	979	221
	1	1015	185	997	203	996	204	1029	171
	2	1001	199	1009	191	987	213	967	233
	3	989	211	986	214	994	206	1005	195
-5	4	1006	194	975	225	998	202	1004	196
	0	984	216	972	228	996	204	958	242
	1	971	229	985	205	976	224	987	213
	2	960	240	982	218	1012	188	1000	200
	3	965	235	965	235	993	207	982	218
-10	4	979	221	992	208	981	219	945	205
Total Average		998	202	997	203	999	201	1001	199
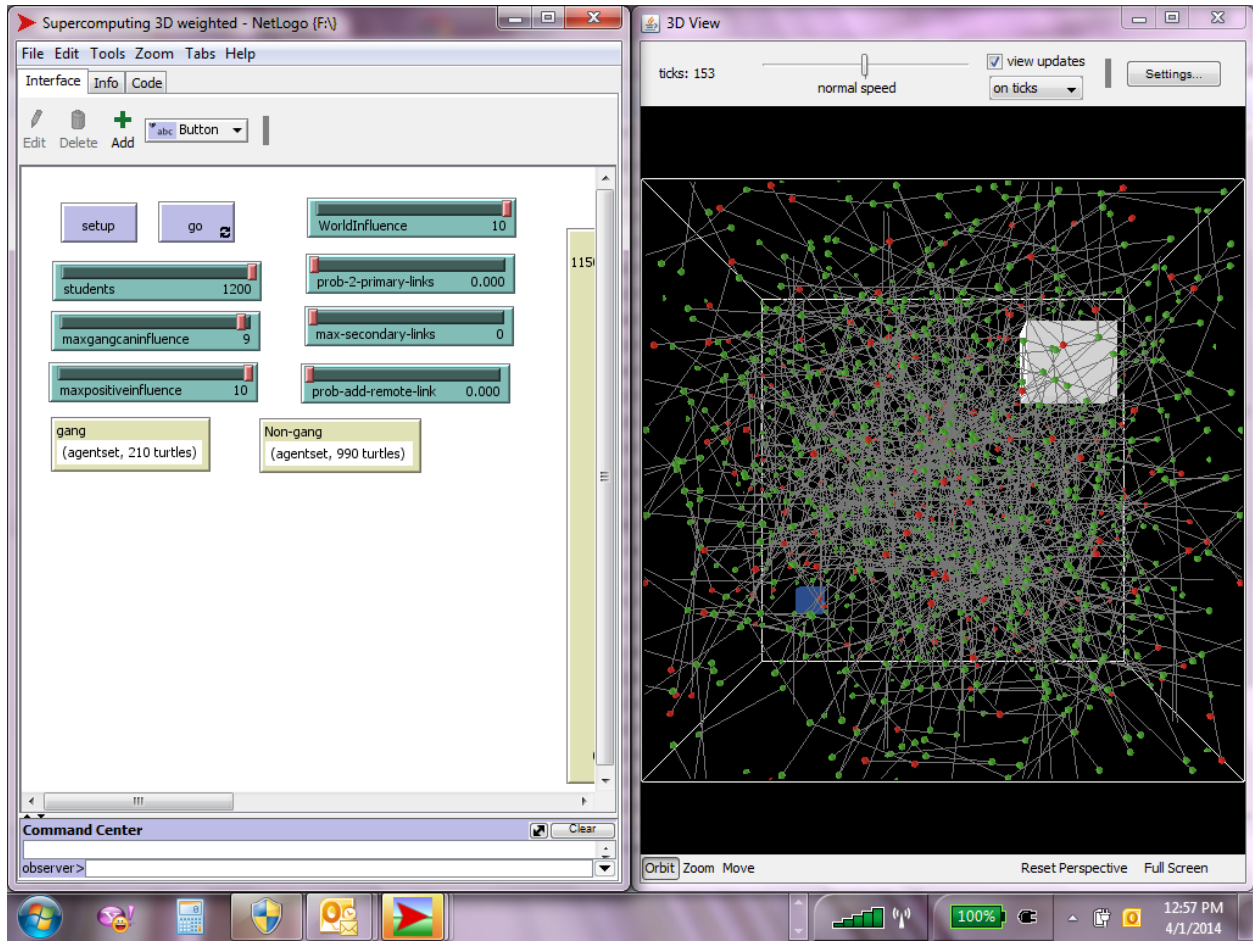
Discussion of Results

We hypothesized that adding a greater positive influence into a community would decrease the amount of gang activity that takes place. Our model proved our hypothesis to be correct but not as drastically as we had hoped. Our constant (when the "WorldInfluence" slider was equal to zero), showed a range between one-hundred eighty-two and one-hundred ninety-seven "gang" turtles. When the maximum amount of positive influence was reached (WorldInfluence = 10), the range became one-hundred eighty-nine to two-hundred one-gang turtles. This shows a small growth in gang activity through positive influence, but not as great as when there was a larger negative. At the peak of the negative slider (WorldInfluence = -10), the range of gang turtles became two-hundred thirteen to two-hundred twenty-four. It does not seem like much throughout a group of over one-thousand turtles, but if we could keep those twenty-seven to thirty students away from gangs, this project would be a success.

Another factor that played a role in our results was the amount of links or friends a turtle had. When there was a greater positive influence, it was better for a turtle to have less links, but when there was a greater negative influence, less links led to more gang members. This shows that individuals with fewer friends are more susceptible to world around them, positive or negative. Now we know that if we want to decrease gang influence, we need to provide more positive influences such as enticing and motivating sports and other activities that youths find worthy of their time and effort which would decrease the time that they spend around gangs.

Accomplishments

We learned that gangs in schools do not necessarily stem directly from activity within the school itself, but from the area that surrounds the school. With this information, we can now develop a method to directly attack the outer poverty in order to keep the inner peace. With our code, we can implement a model of multiple schools throughout the state and graph a projection of the outcomes that community projects would have on the well-being of the student body it would affect. This code may become an invaluable tool for administrators, school principals, assistant principals, and counselors to deal with gangs in a more effective manner than they are in the present. It also provides the community tools to use in order to minimize gang membership and maximize positive societal contributions. We can then push the results from solely school-based to a more community-wide agenda which would then decrease gang membership in the older members of society.

Acknowledgment

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