Neurology and Epilepsy

New Mexico Supercomputing Challenge
Final Report
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Executive Summary

Epilepsy is a growing problem with today's population. Other than just car accidents, and drug addictions there are also birth defects that can cause this some times fatal neurological disorder. This project is not about the disorder but rather a way to explain it. Using StarLogo TNG we have created an interactive model that will help explain what happens in the average human brain, in an epileptics brain, and when the brain has rewired and created a new neuron after having a procedure done to help get rid of the neuron that was misinterpreting the messages it received that made the brain lose control.

1. Statement of the Problem

A lot of People do not understand how one nerve can cause such a huge problem. As we all know everyone has a different way of learning. Most of today's society learns more when they can interact with a program or see it on a screen. Modern day scientists have discovered that a surgery that if done before the age of 10 can trigger the brain to rewire its self without harming the brains development.

The goal of this project is to help explain epilepsy to patients, their families, and students.

2. Introduction

Epilepsy is hard to live with as a patient, or the friends and family of someone with this neurological disorder. This disorder can be even harder to understand to anyone. In this project we have created a model using StarLogo TNG to help show what happens using 3 different settings.

These settings will be used separately to help show what is happening in the brain in the average brain, in an epileptic, and in some one who has had surgery before the age of 10 and has rewired.

During the alarm setting the program will show what is going on during a seizure when the alarm goes off the body has gone into a seizure and lost control. During this each individual brain signal or sphere has either gone over the misinterpreting patch or over a path that has been sent I a miss interpreted message.

During the correction setting although the miss interpretation has continued the brain still has it under control. With each misinterpreted message the neurons have either ignored or sorted it out and sent the correct response.

In the setting for the editing or surgery has taken place the brain has re wired itself to replace that missing neuron and can function normal. In which case the brain would have had to grown out of it over time.

Each brain is different but it basically comes down to the same thing when it comes to explaining seizures.

Appendix A

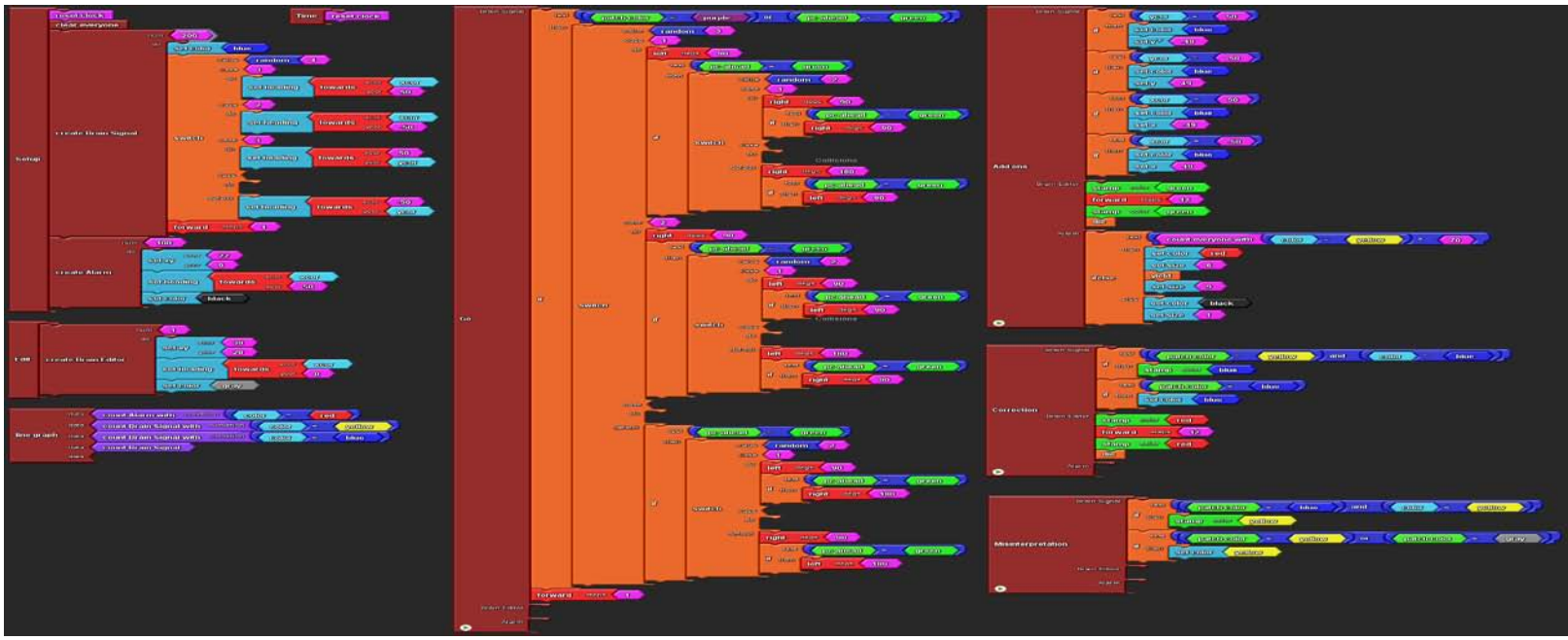

Figure 1

As shown in figure 1 the work behind the project is relatively simple. In here each is either a set up or forever that is simply renamed the brain editor, brain signals and alarm are each given a task. The paths to the patch or neuron is green the gray patch is the misinterpreting neuron and the alarm lets you know when the body has gone into a seizure.

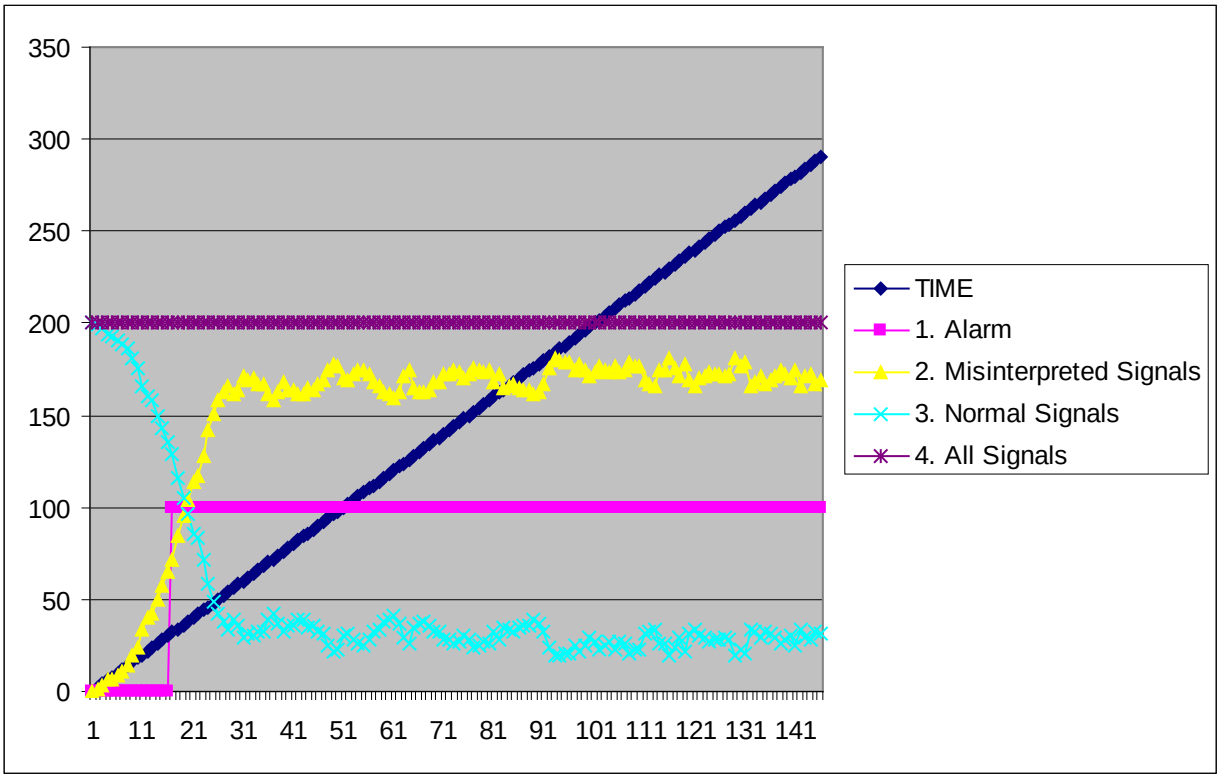

Figure 2

In figure 2 you see as in the body having a seizure as you can see as the number of misinterpreted signals so did the size of the alarm.

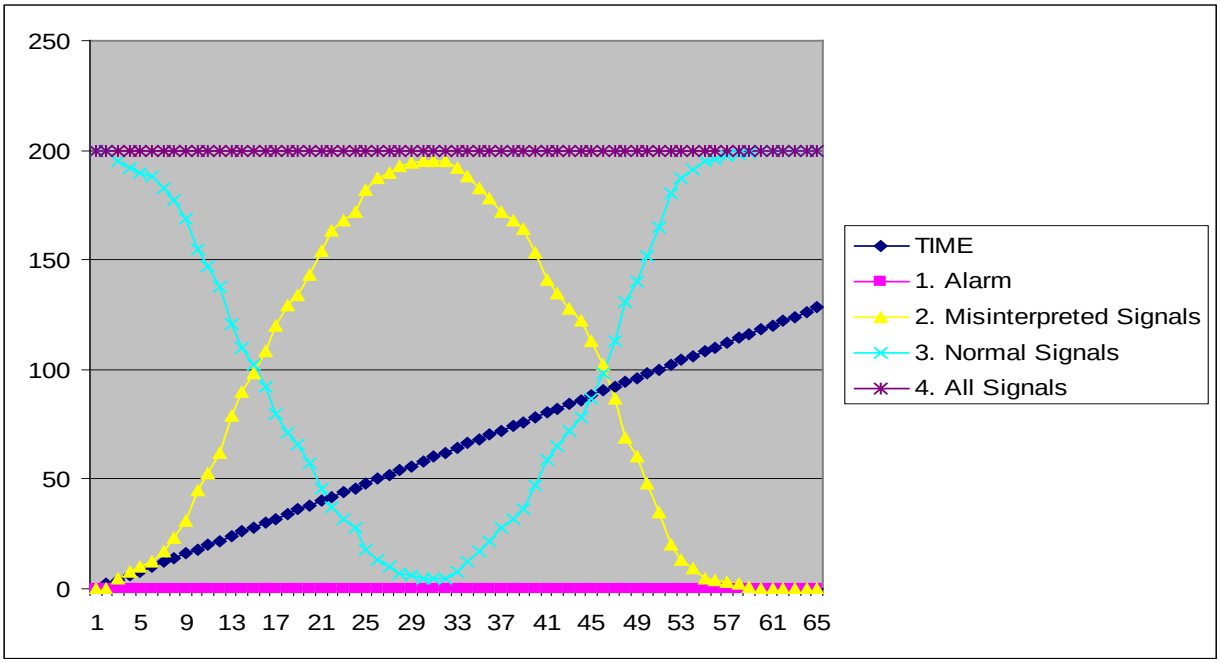

Figure 3

In figure 3 the brain has control rather than losing it. The fact is the brain is acting average.

In the average brain there are misinterpretations but they are more controlled by the surrounding nerves.

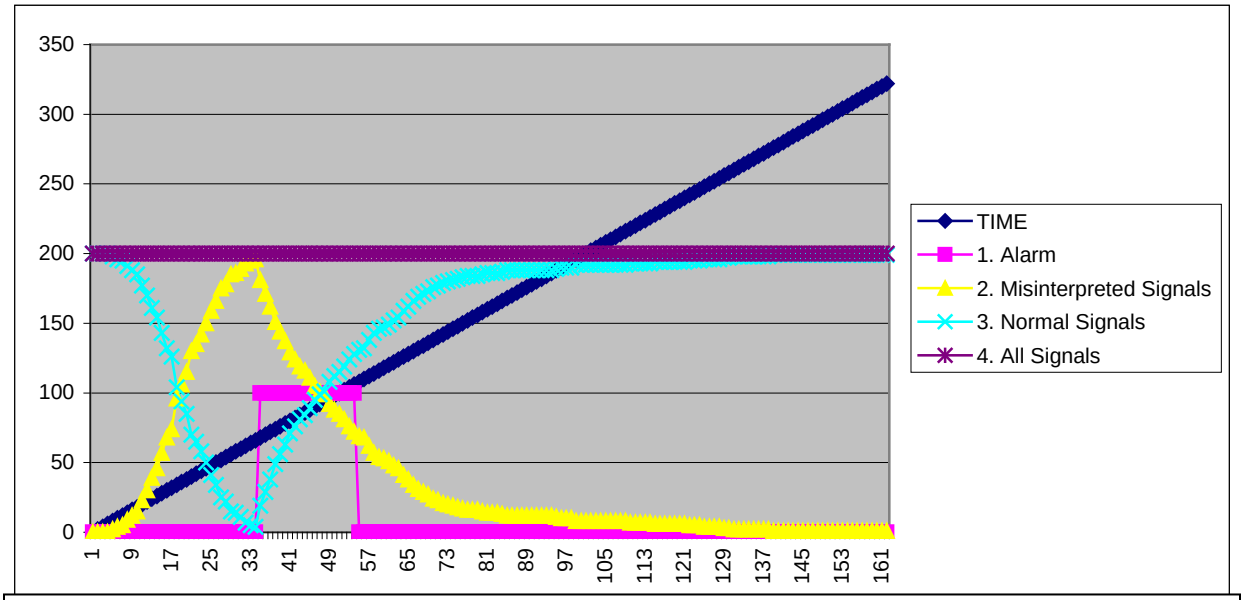

Figure 4

In figure 4 the brain editor has come in after a few seconds have passed and destroyed the faulty nerve and has created a new path or neuron for the messages to go through.

Figures 2,3,and 4 are line graphs created from data collected during the time the program was running.

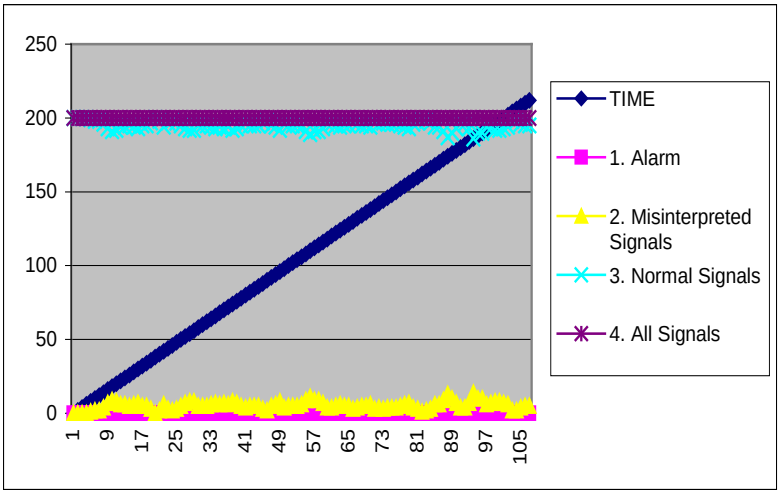

Figure 5

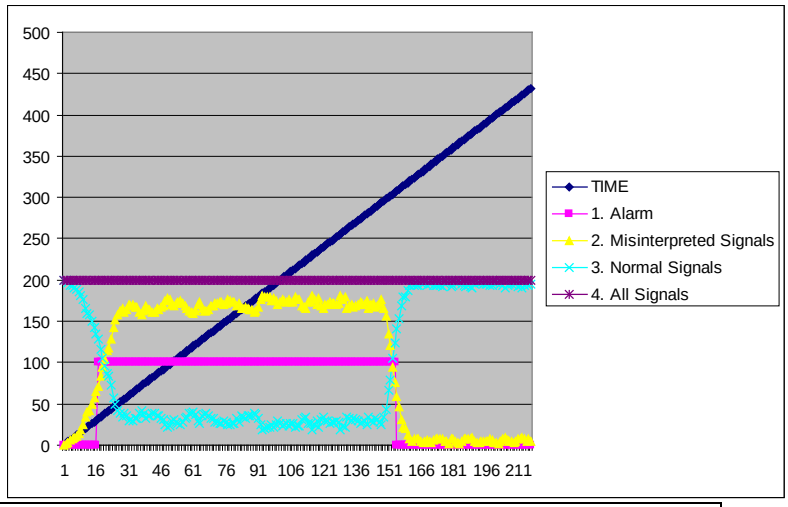

Figure6

In figure 5 the data collected is where the brain was all no longer receiving messages from the gray patch or the problem neuron.

In figure 6 as the seizure was triggered the brain either by outside help through medicine or just by letting it happen corrected the problem and stopped the seizure through the help of the brain editor in this case the brain editor would represent medicine or it would have stopped just for the time being.

Bibliography

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Dr. L Longfield

Dr. Roper

Katelynn's scans and test results

Mrs. Rowen
Mrs. Velarde

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past doctors and nurses