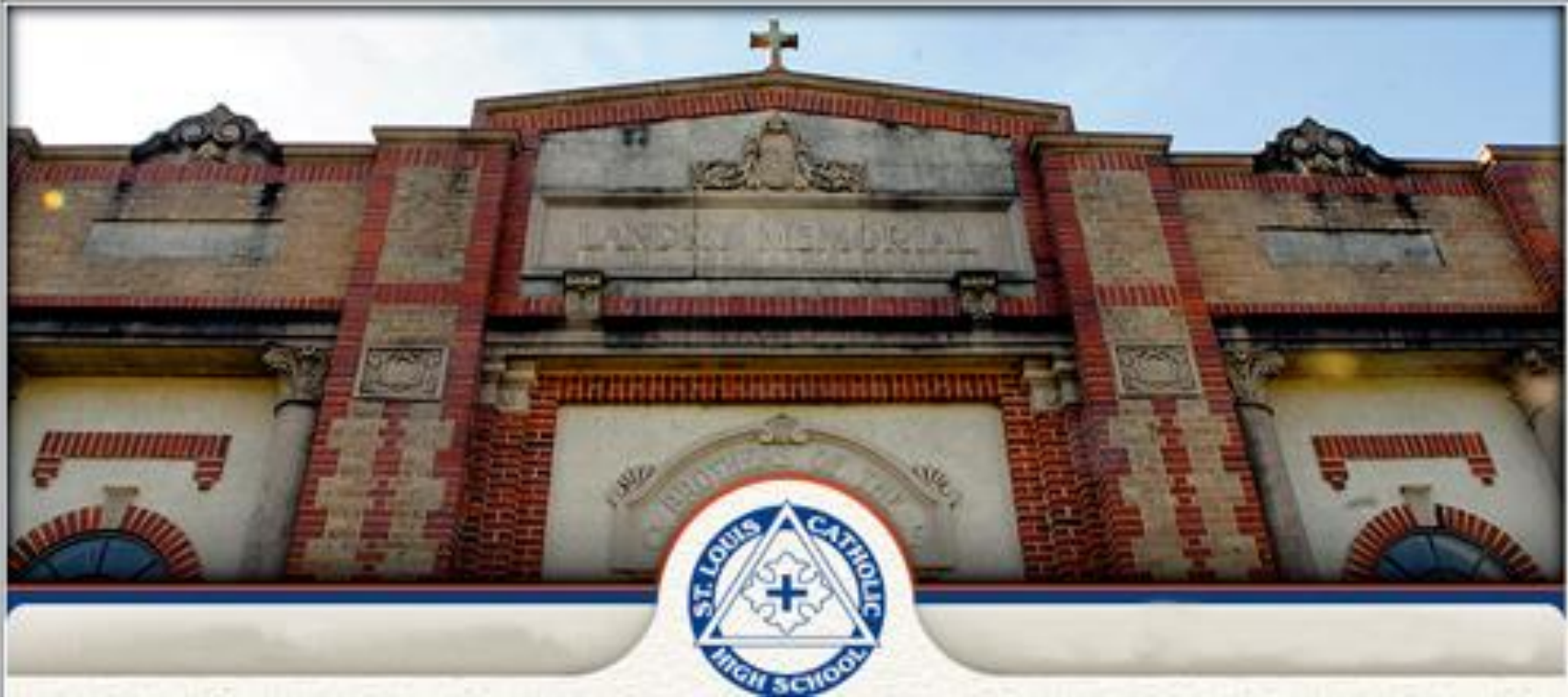


The LA-SiGMA Experience: A Pre- Freshman's Encounter with Research

By Natasha Navejar

Before I Arrived



- Recent graduate of Saint Louis Catholic High School in Lake Charles, LA
- Interests in neuroscience, physics, and mathematics

Dr. Butler's Lab



AJ Pisano

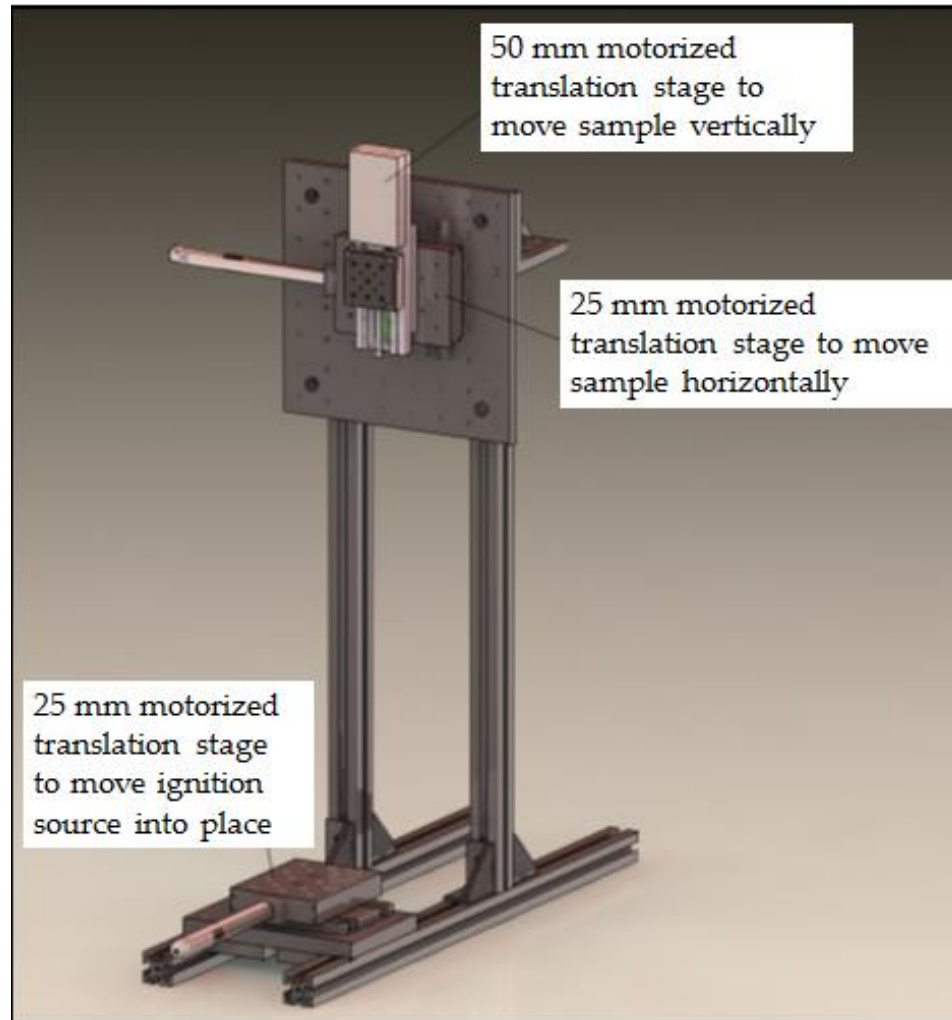
Zack Daniels

The Research Problem

Engineer a machine with the capability of tracking moving samples and attaining chemical data from them efficiently despite an extremely small field of view



Initial SolidWorks Design



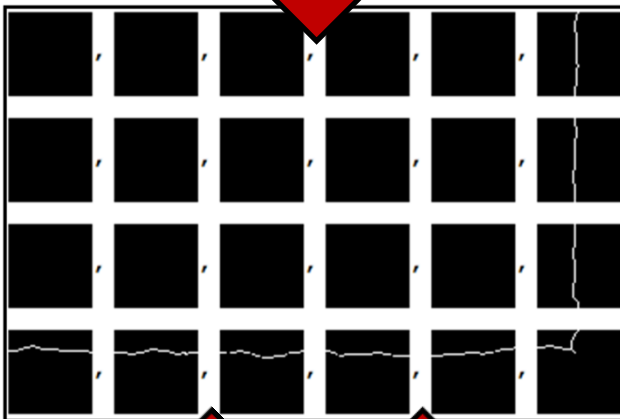
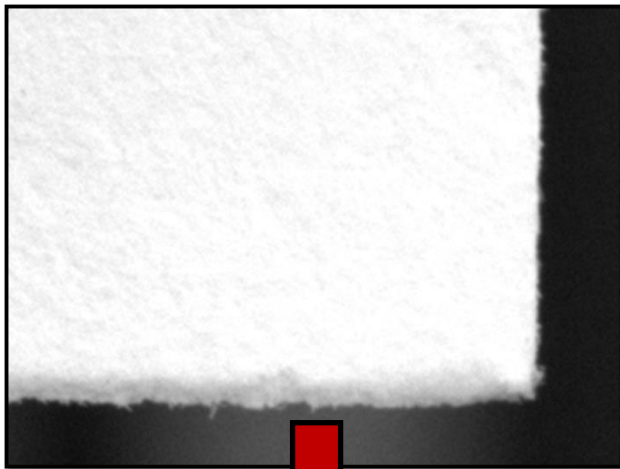
Field Trip to Burn Test Lab



 ALBEMARLE®

Image Processing

Computer #1 (Mac)



(Debug) Out[1]= {

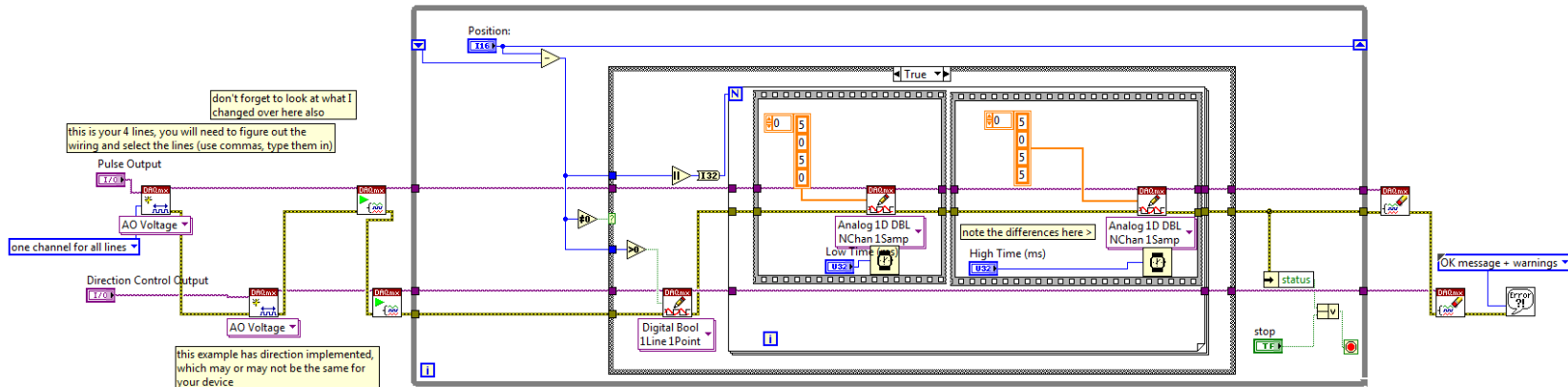
(Debug) Out[2]= 355
(Debug) Out[3]= 1

(Debug) Out[1]= {

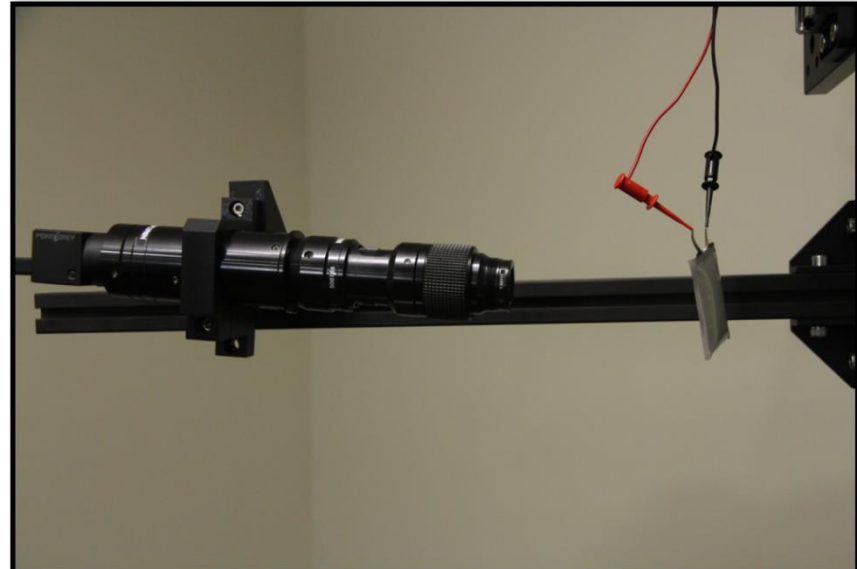
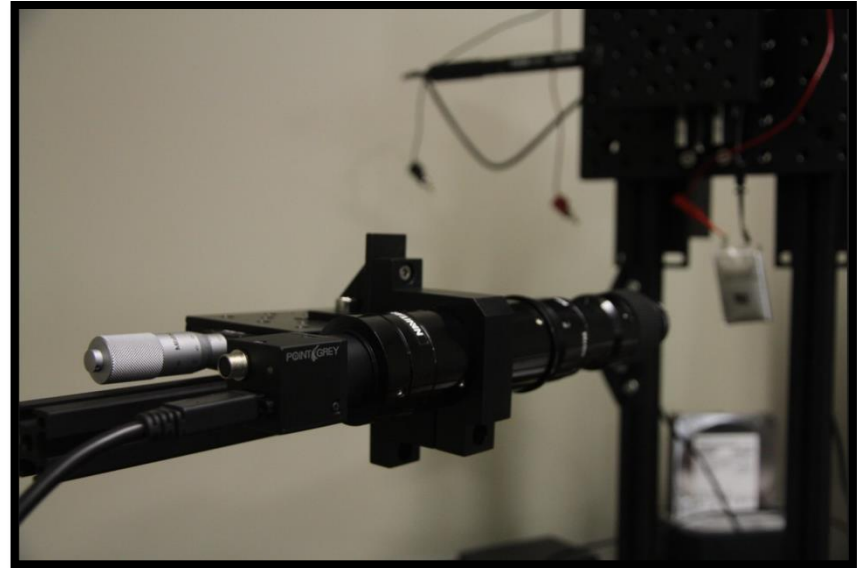
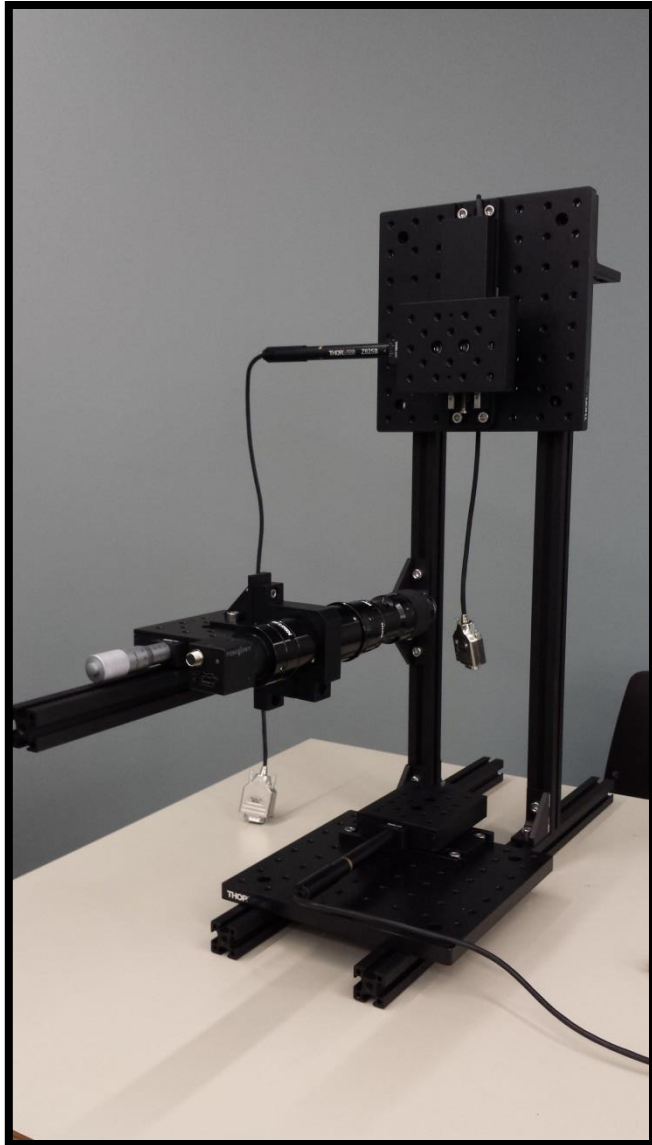
(Debug) Out[2]= 98
(Debug) Out[3]= 0

Motor Control

Computer #2
(Windows)



Finished Product



Challenges

- Mac
- Mechanical Engineering
- Computer Programming
 - SolidWorks
 - Python(initially)
 - Mathematica
 - LabVIEW
- System Integration



```
for (int j = 0; j < loci.length; j++) res[j] = bi
return res;

public void decodeMessage(int[] res) {
    for (int i = 0; i < res.length; i++) {
        res[i] = checkRes(res[i]);
    }
}

decodeMessage(
    0; i < MAX_RES_LEN; i++) buf
    i = 0;
    s.length) {
        i) buf[loc
        RES_LEN)

    errCode
    return null;

    extractMessage(

public int[] extractMessage(int[] res) {
    for (int i = 0; i < MAX_RES_LEN; i++) buf
    int loc = 0, i = 0;
    while (i < res.length) {
```

Future Plans

- Neuroscience major
(possible minor or double
major in engineering) at
Tulane University
- Research in college



Acknowledgments

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Louisiana Alliance for Simulation-Guided Materials Applications

