Rehabilitation Exercises for Environmental Control

Final Presentation
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Outline

- Introduction
- OKRs
- Progress
- Future
- Questions

Introduction

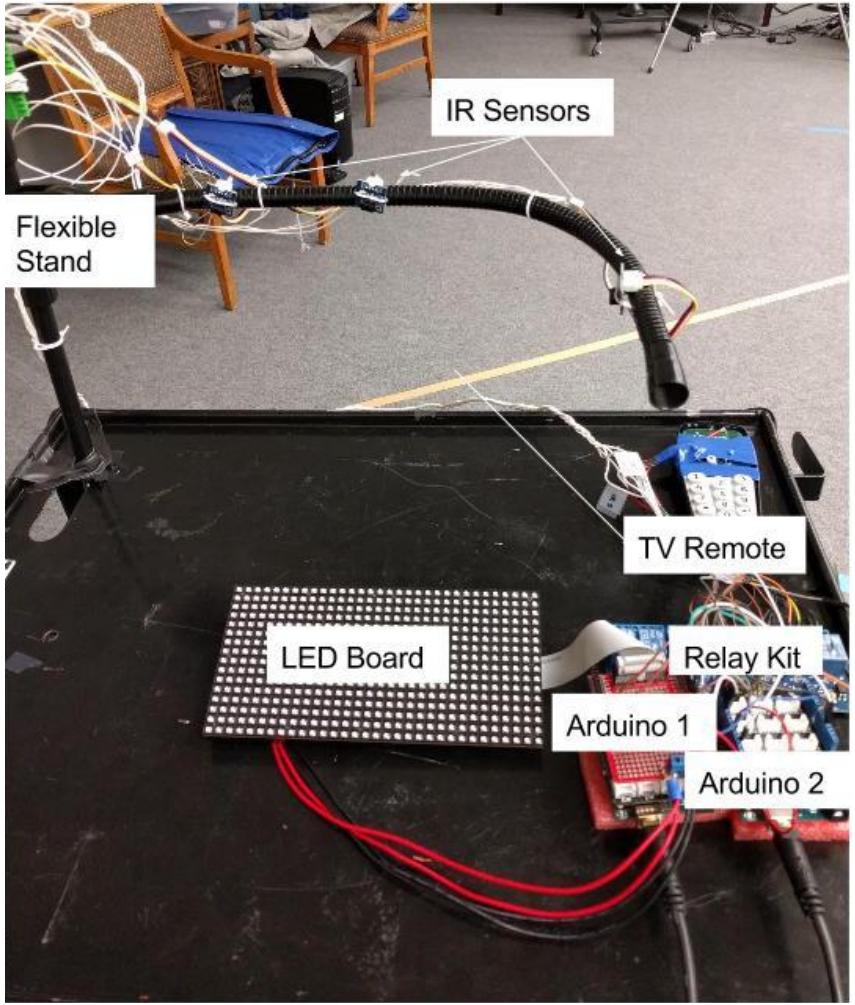
- The Problem
- The Solution
- How?

The Problem

- Rehabilitation for patients who don't have access to constant therapy
- Repetitive exercises are challenging
- Expensive

The Solution

- Home-based rehabilitation system



How?

- Focus on Patients Interests

Table 11. Time spent in leisure and sports activities for the civilian population by selected characteristics, 2014 annual averages

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Characteristic	Average hours per day spent in leisure and sports activities															
	Total, all leisure and sports activities			Participating in sports, exercise and recreation		Socializing and communicating		Watching TV		Reading		Relaxing/ thinking		Playing games and computer use for leisure		Other leisure and sports activities, including travel(1)	
	Total, all days	Week-days	Week-ends and holi-days	Week-days	Week-ends and holi-days	Week-days	Week-ends and holi-days	Week-days	Week-ends and holi-days	Week-days	Week-ends and holi-days	Week-days	Week-ends and holi-days	Week-days	Week-ends and holi-days	Week-days	Week-ends and holi-days
Sex																	
Men	5.71	5.11	7.10	0.36	0.44	0.56	1.00	2.76	3.73	0.25	0.29	0.32	0.33	0.49	0.68	0.37	0.63
Women	4.93	4.50	5.93	0.20	0.23	0.60	1.04	2.45	2.99	0.35	0.41	0.23	0.28	0.35	0.38	0.32	0.61
Age																	
Total, 15 years and over	5.30	4.79	6.50	0.28	0.33	0.58	1.02	2.60	3.35	0.31	0.35	0.27	0.31	0.42	0.52	0.34	0.62
15 to 19 years	5.74	5.26	6.85	0.60	0.64	0.73	0.90	2.19	2.94	0.09	0.14	0.18	0.18	0.75	1.24	0.71	0.81
20 to 24 years	5.45	5.07	6.38	0.35	0.47	0.77	1.24	2.35	2.77	0.25	0.17	0.13	0.13	0.82	0.92	0.40	0.68
25 to 34 years	4.34	3.70	5.83	0.25	0.39	0.63	1.15	1.81	2.63	0.13	0.12	0.24	0.28	0.33	0.54	0.31	0.72
35 to 44 years	4.10	3.50	5.52	0.23	0.35	0.47	1.06	1.89	2.80	0.14	0.19	0.19	0.22	0.28	0.30	0.29	0.59
45 to 54 years	4.75	4.13	6.19	0.22	0.28	0.50	1.04	2.40	3.33	0.21	0.28	0.28	0.32	0.25	0.40	0.27	0.54
55 to 64 years	5.45	4.93	6.70	0.24	0.23	0.46	0.87	3.00	3.85	0.33	0.46	0.30	0.32	0.35	0.39	0.26	0.58
65 to 74 years	6.94	6.60	7.72	0.28	0.24	0.64	0.96	3.88	4.38	0.59	0.72	0.33	0.39	0.49	0.42	0.38	0.62
75 years and over	8.02	7.89	8.31	0.19	0.14	0.62	0.89	4.41	4.76	1.12	1.02	0.70	0.69	0.51	0.40	0.34	0.42

How?

- Cost effective
- Flexible by patients needs
- Interactive and motivates patients to do exercises

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OKRs

1. Complete Game Mode
   - -Use LED Board to display movements
   - -Connect LED board and sensors
   - -Feedback
2. Complete TV Mode
   - -Sensors detect movements and control TV
   - -Power, Channel Up/Down, Volume Up/Down

OKRs

3. Movement Recognition
    -Checking the correctness of movement

4. Finish GUI and Implement it
    -Complete TV mode and implement it
    -Complete Game mode and implement it

5. Use Kinect Sensor
    -Be able to use more challenging movements

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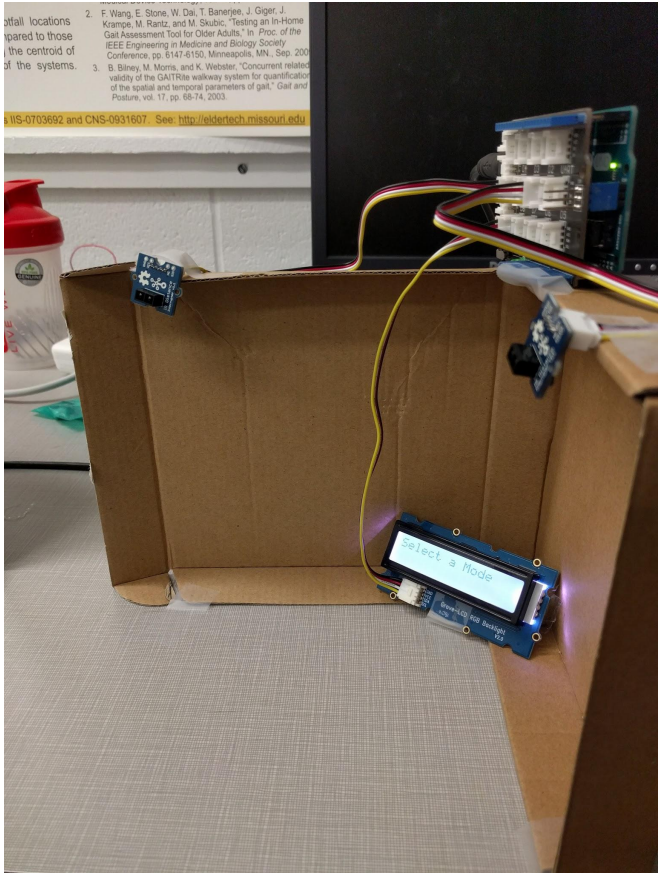
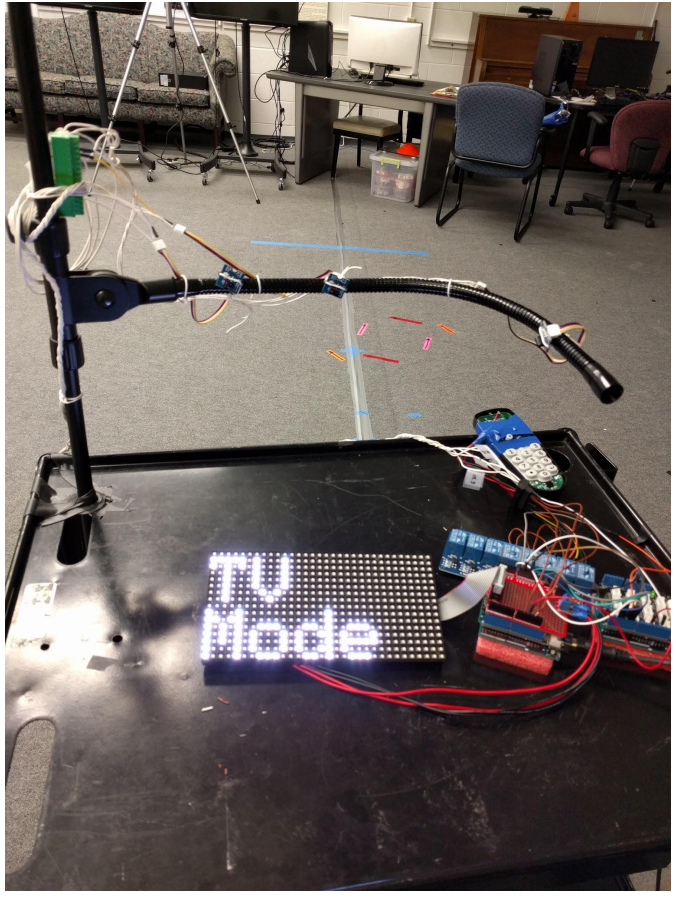
Progress





First Step

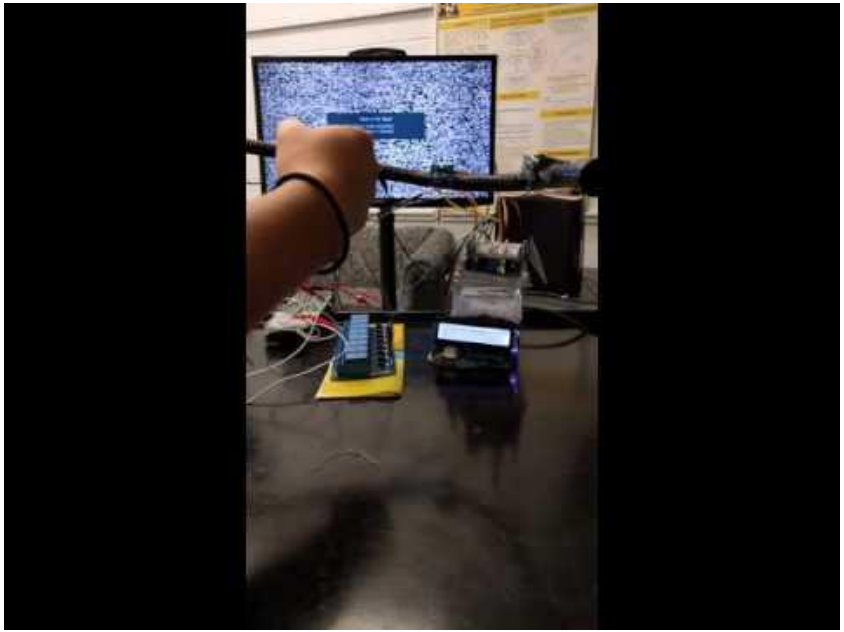
- Understand Arduino
- Understand IR sensors

Second Step

- Movement Recognition

Third Step

- Implementing TV remote with arduino
- Combining TV and Game mode

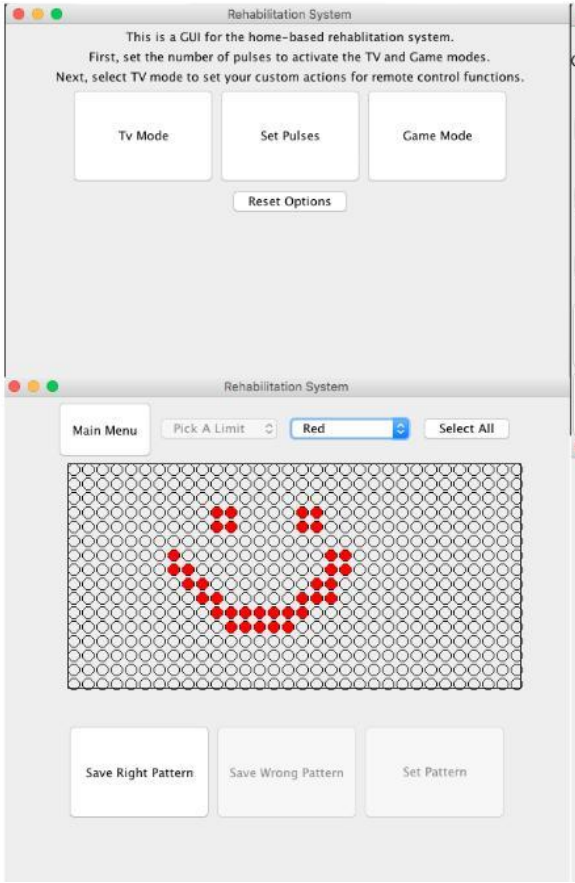


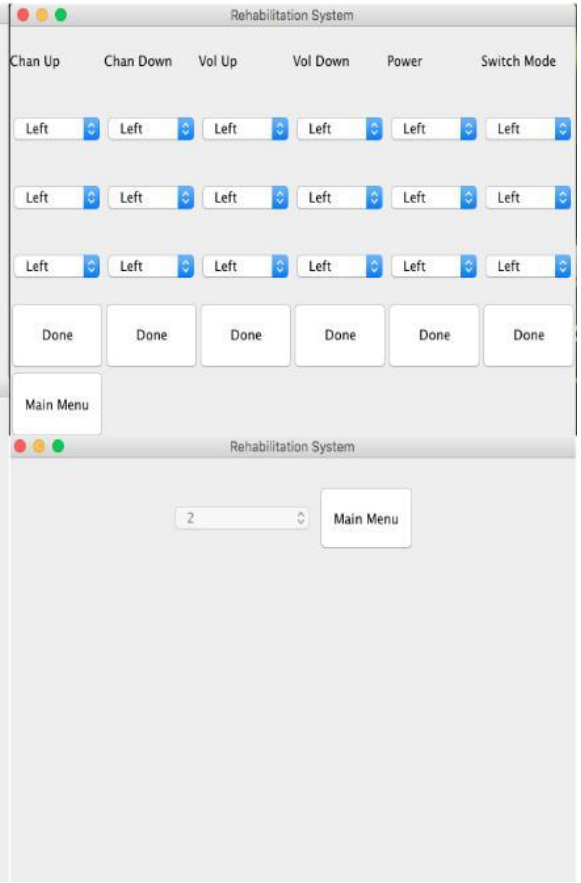
Fourth Step

- Implemented LED Board for Game Mode
- Complete Hardware Prototype

Final Step

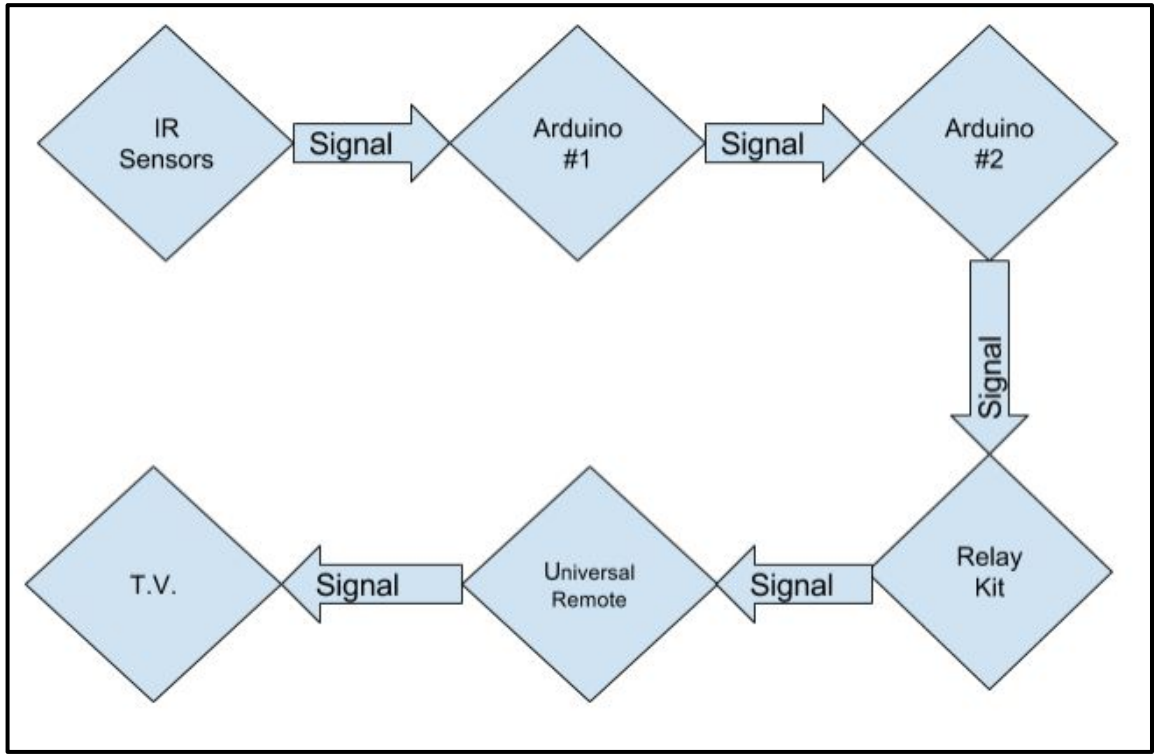
- Making a Graphical User Interface (GUI)





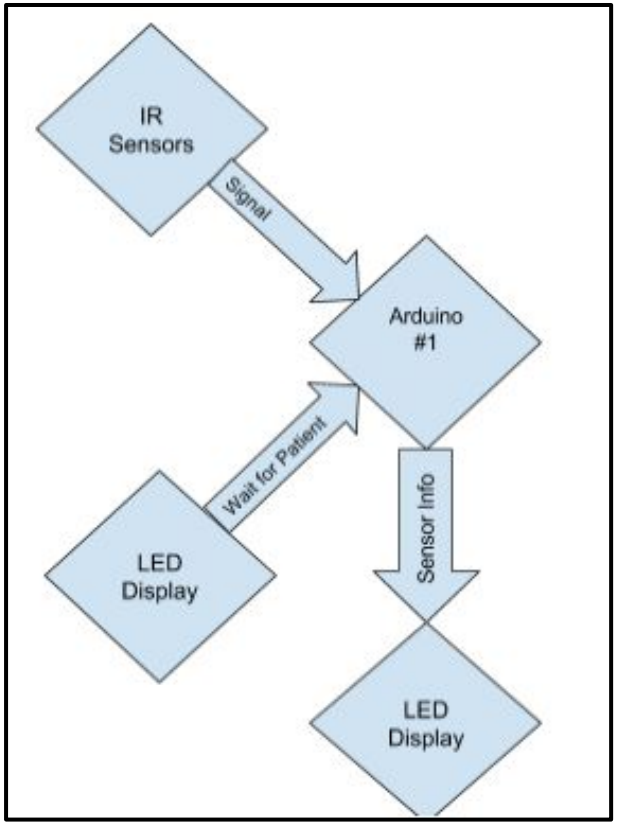
Flow Charts

- TV Mode



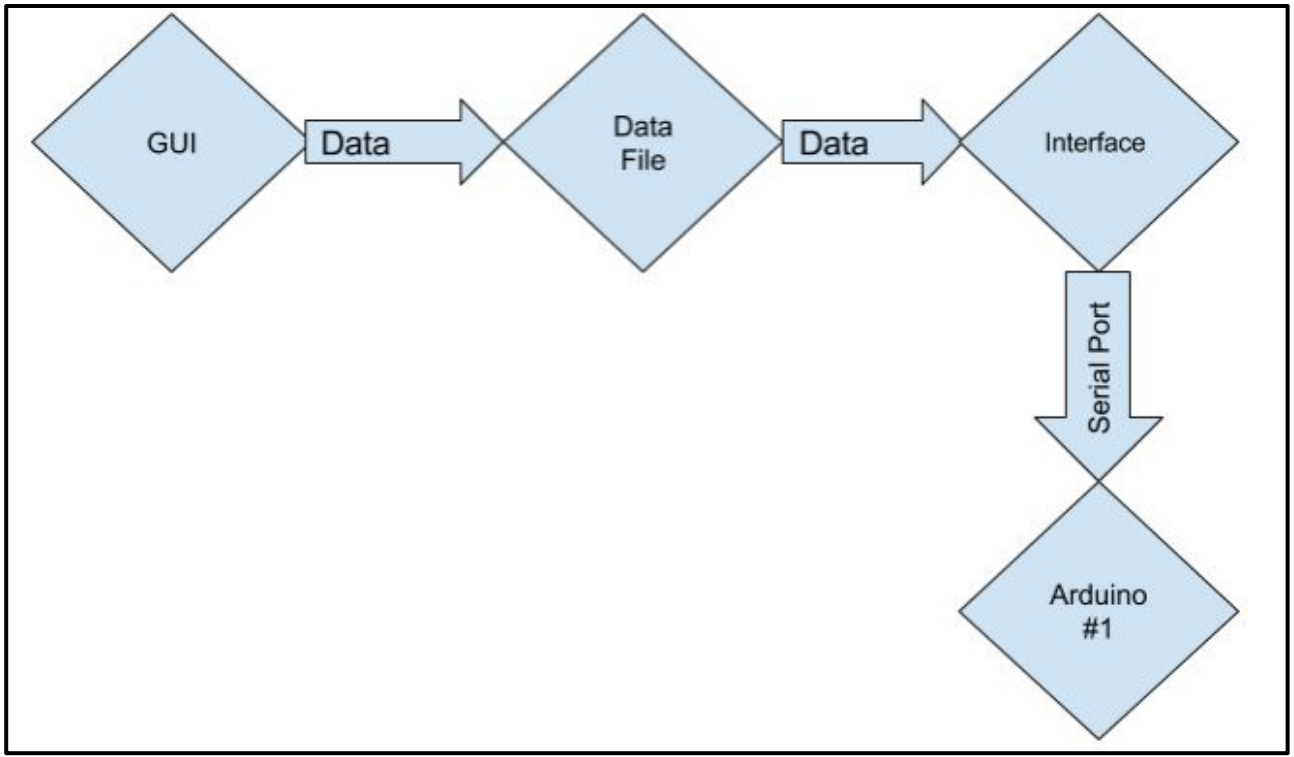
Flow Charts

- Game Mode



Flow Charts

- GUI



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Future

- Meet with Patients
- Fix memory issue and finish implementing GUI
- Use Kinect sensor

Questions?