

LightPainter



Team 14

Presenters:

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Project Concept

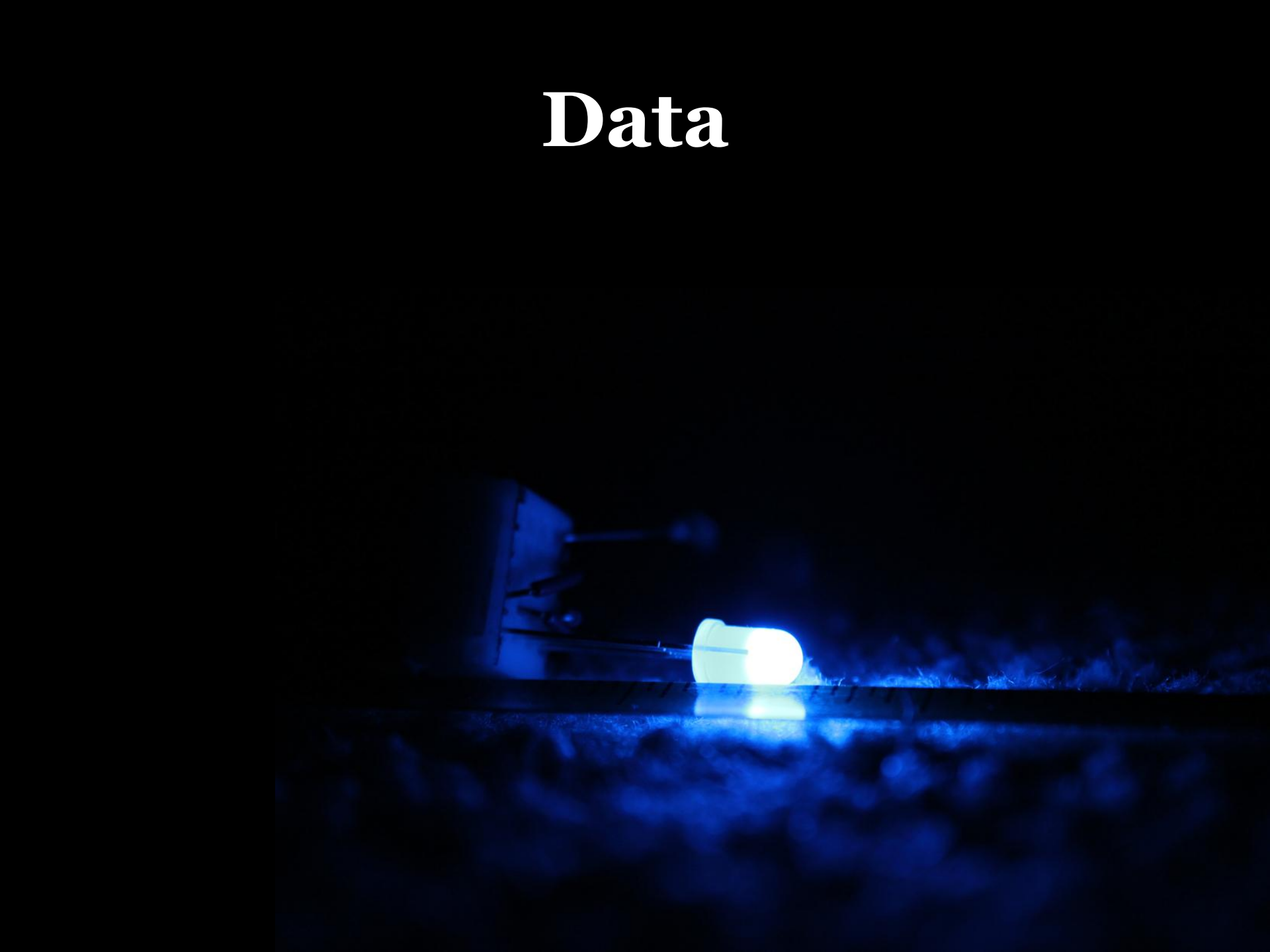
- **Quickly create light paintings**
 - Wand
 - Cameras
- **Create Editable Drawings**

Important Metrics



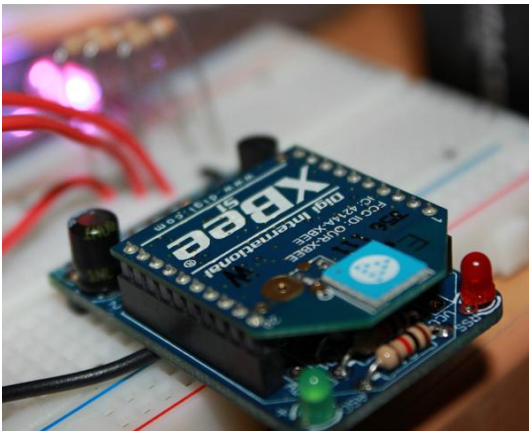
- Distance Tracking Accuracy
- Processing capability
- Battery Life
- Xbee Distance

Data



Xbee Distance

- Tested Xbee command detection distance
- >70 Feet, no obstructions
 - Far beyond expected use distance



Battery Life

- Average Current Draw: 109.46 mA
 - Highest observed: 116.2 mA
- Operation time with 9V battery: 3.65 hours



Distance Detection

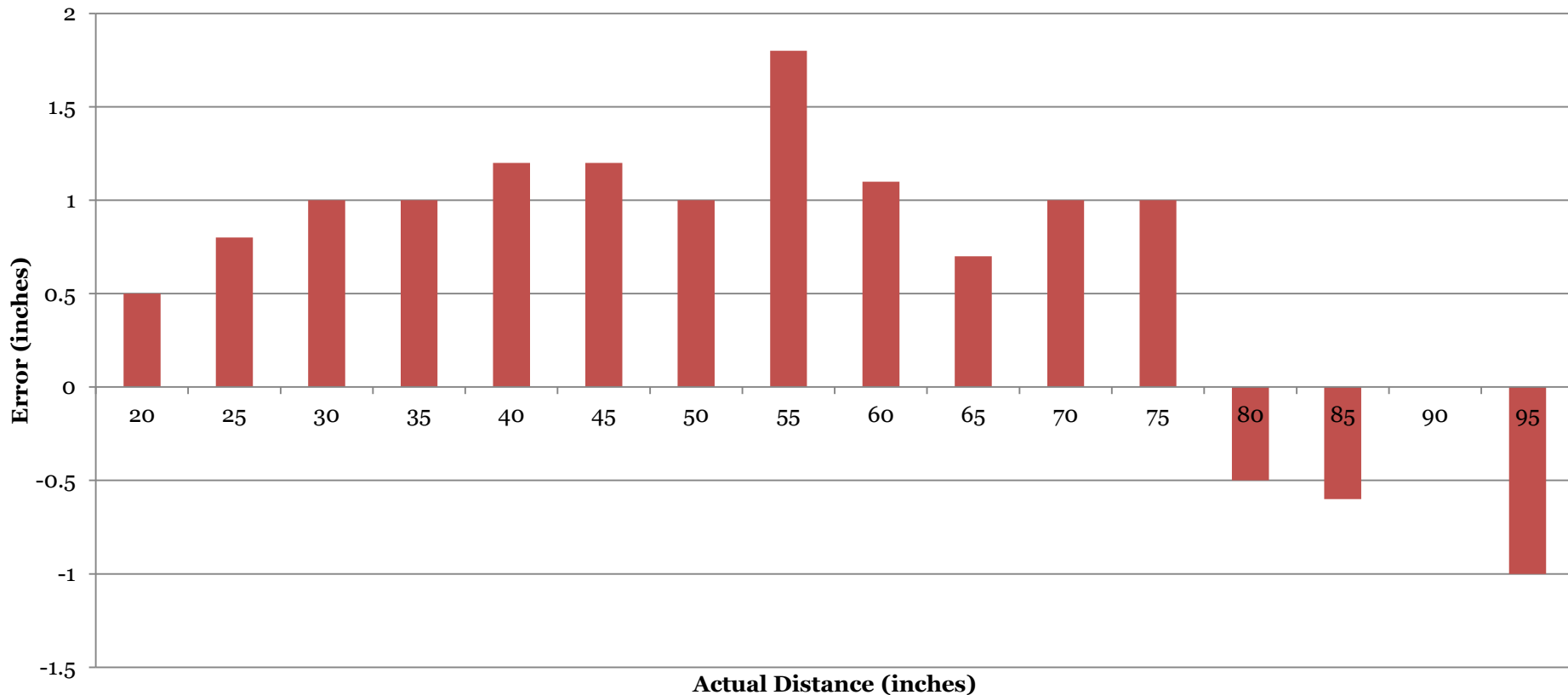
- Placed the LightWand on the floor
 - Measured distance using ruler
 - Compared to output of distance detection system



Distance Detection

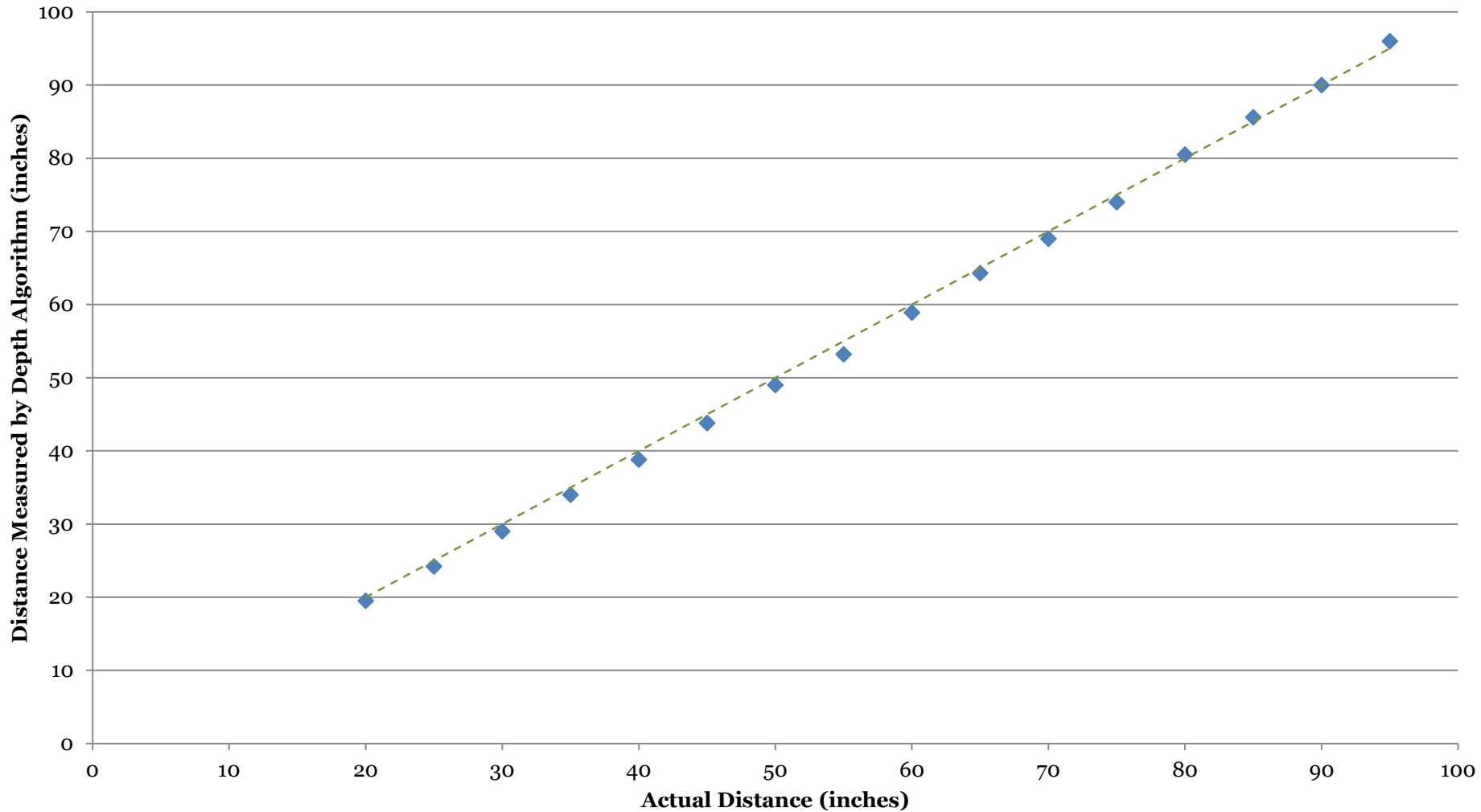
- Avg error: .64 in
- Max Error: 1.8 in

Difference Between Measured and Actual Distance



Distance Detection

Distance Measured by Depth Algorithm at Various Distances



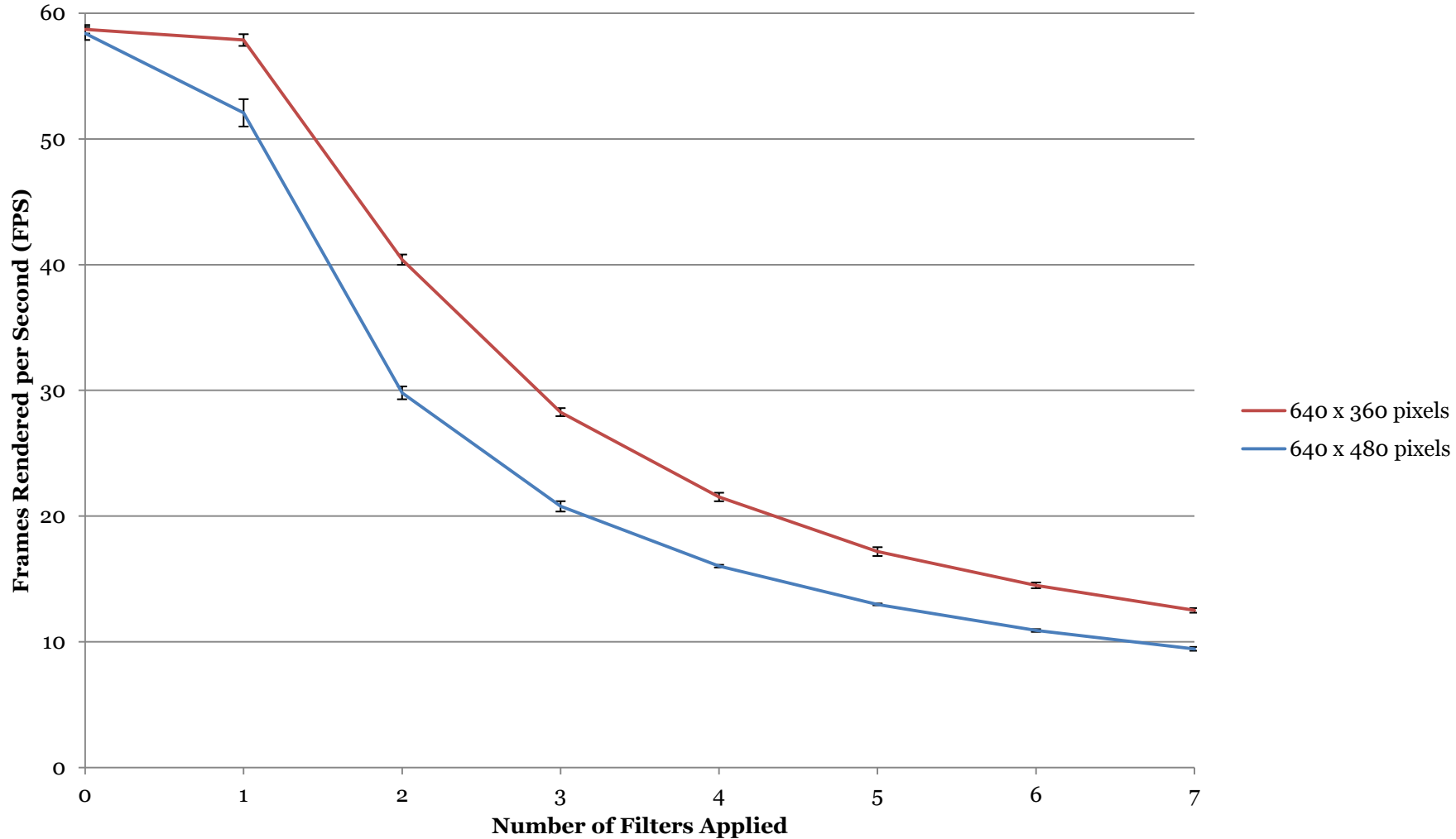
Processing Capability

- Ran a very intense video calculation
 - Varied image dimensions
 - Ran on average laptop
 - Received an average FPS



Processing Capability

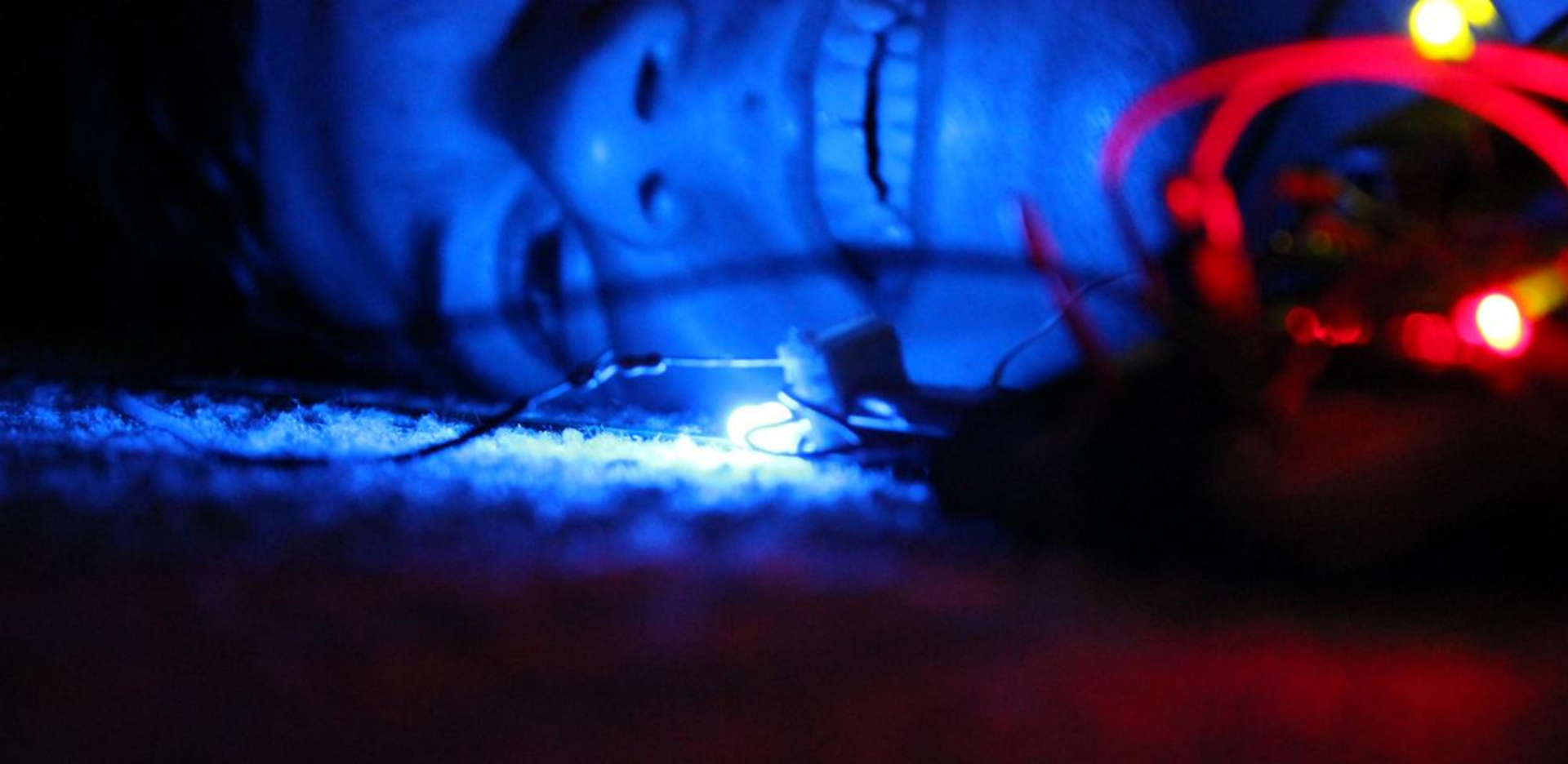
Frames Rendered versus Number of Filters



Conclusion

- Xbee communication is reliable
- Long Battery Life
- Accurate Distance Tracking





Questions?

Appendix: Processing Capability Data

640x480: Trial\Filters	<i>0</i>	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>	<i>6</i>	<i>7</i>
#1	58.41	50.03	30.37	20.33	16.03	13.03	11.02	9.04
#2	58.62	51.89	29.69	20.82	16.14	13.00	10.96	9.52
#3	57.97	52.88	29.73	20.66	16.16	13.00	10.88	9.50
#4	59.03	51.47	29.92	20.82	16.02	12.92	10.71	9.42
#5	57.60	52.58	29.99	19.90	15.93	13.07	10.80	9.42
#6	58.48	52.97	29.75	21.08	16.07	12.96	10.78	9.58
#7	59.00	52.47	30.16	21.31	16.09	13.02	10.94	9.43
#8	57.57	52.77	29.90	20.75	15.89	13.06	10.92	9.49
#9	58.65	53.19	28.48	20.95	15.83	12.88	10.93	9.57
#10	58.51	50.51	30.02	21.14	16.06	12.85	11.07	9.49
<i>Avg</i>	58.38	52.07	29.80	20.78	16.02	12.98	10.90	9.45
<i>Stdev</i>	0.52	1.09	0.51	0.41	0.11	0.07	0.11	0.15
640x360: Trial\Filters	<i>0</i>	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>	<i>6</i>	<i>7</i>
#1	58.69	57.60	40.49	27.92	21.13	17.09	14.59	12.60
#2	58.58	57.24	40.06	28.11	21.73	17.42	14.03	12.55
#3	59.10	58.45	41.02	28.93	21.66	16.31	14.45	12.68
#4	59.28	58.17	40.47	28.49	21.45	17.04	14.18	12.58
#5	58.93	57.41	40.75	28.04	21.62	17.02	14.43	12.66
#6	58.93	57.24	40.54	28.18	21.66	17.35	14.65	12.08
#7	58.21	58.07	40.77	28.64	21.79	17.32	14.50	12.27
#8	58.69	58.31	40.13	28.29	20.87	17.29	14.75	12.57
#9	58.41	58.34	39.65	27.96	21.31	17.53	14.66	12.52
#10	58.38	57.80	40.11	28.18	22.01	17.44	14.69	12.52
<i>Avg</i>	58.72	57.86	40.40	28.27	21.52	17.18	14.49	12.50
<i>Stdev</i>	0.34	0.47	0.41	0.32	0.34	0.35	0.23	0.19