

Quantitative Analysis

Cynthia Taylor, CSE 118, October 21 2011

General Feedback

- Milestone Feedback
- Research vs Product
- What is a research contribution?

Why are we giving you so much feedback on milestones?

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- We are jerks

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- We want your projects to be awesome.

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- ~~We are jerks~~
- We want your projects to be awesome.
- So that we can give you As.

Research Vs Products

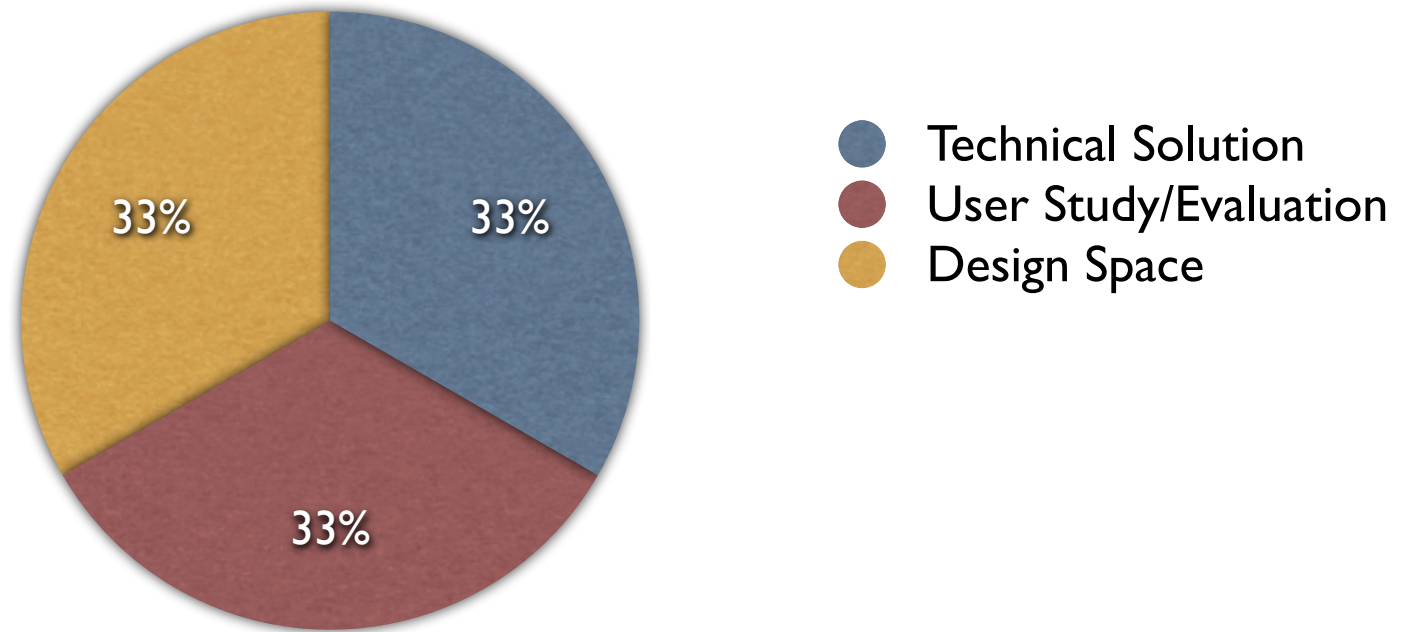
Research Vs Products

- New
- Solves 1 Problem
- “Five Years Ahead”
- Not Perfect
- Doesn't Need To Be Original
- Fits Current World/Tech
- Needs to be Bulletproof

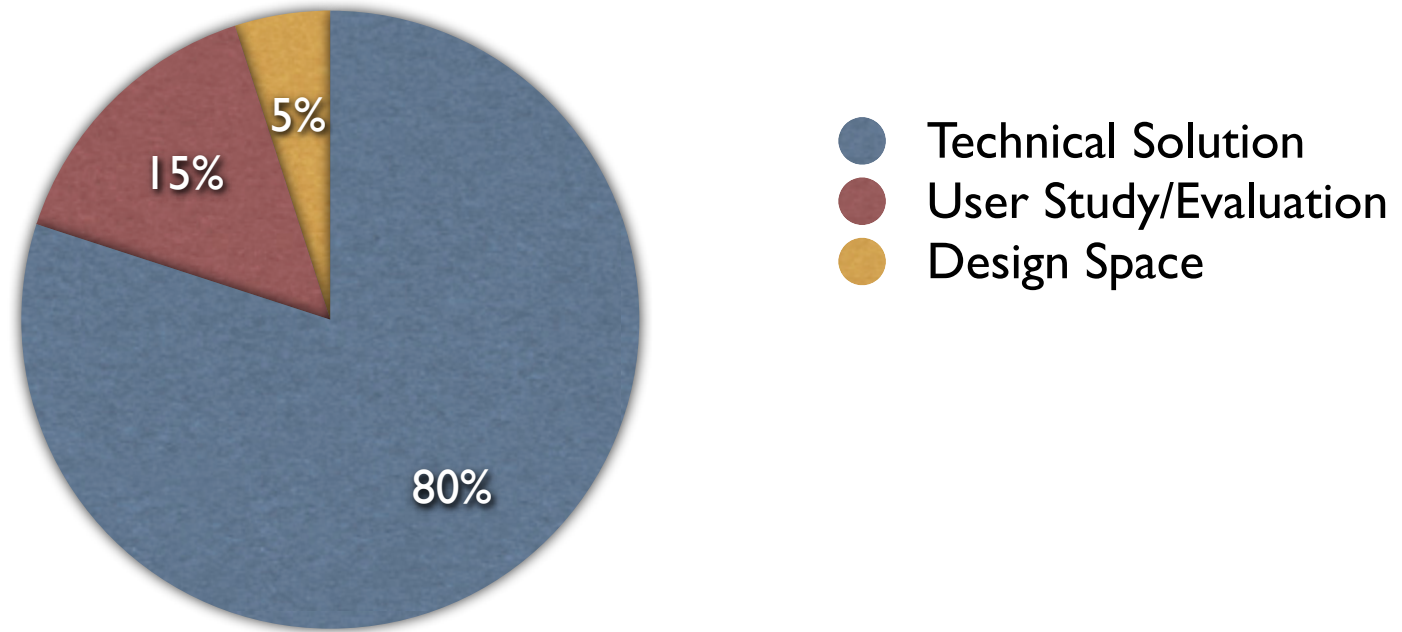
Research Vs Products

- Add New Idea to Academic Discourse
- Sell Things To People

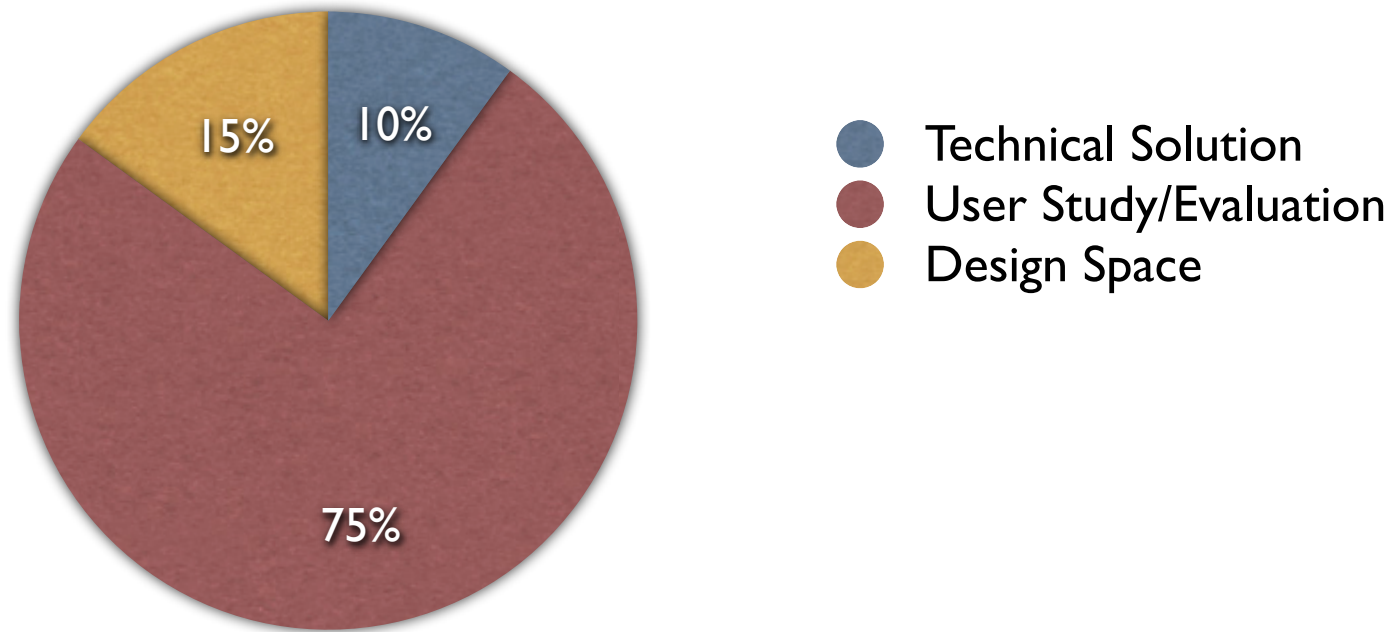
Research Contribution



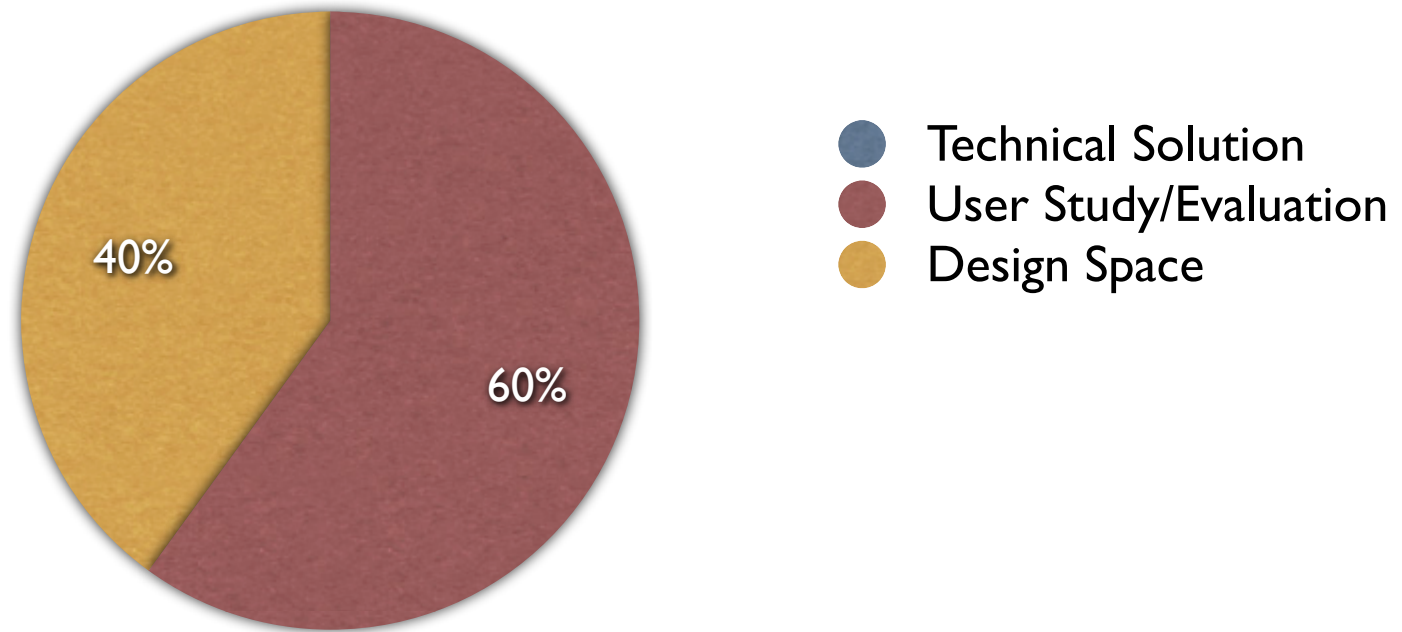
ZebraNet



Where Abouts Clock



Natural Sensing



Quantitative Analysis

- What is quantitative analysis?

Quantitative Analysis

- What is quantitative analysis?
 - Results where you measure something (with numbers!)
 - Statistical analysis of those measurements

Quantitative Analysis

- What are some good things to measure?

Quantitative Analysis

- What are some good things to measure?
 - Time
 - How long it takes something to run, how long a user interacts with something
 - Number of Interactions
 - Number of clicks, number of times a user performs an action
 - Bandwidth, Throughput, etc . . .
 - Numerical Ratings from User Studies

Mean/Median

- Mean
- Median

Mean/Median

- Mean
 - For values $\{a_1 \dots a_n\}$, $(a_1 + \dots + a_n)/n$
- Median
 - For (ordered) values $\{a_1 \dots a_n\}$, $a_{n/2}$

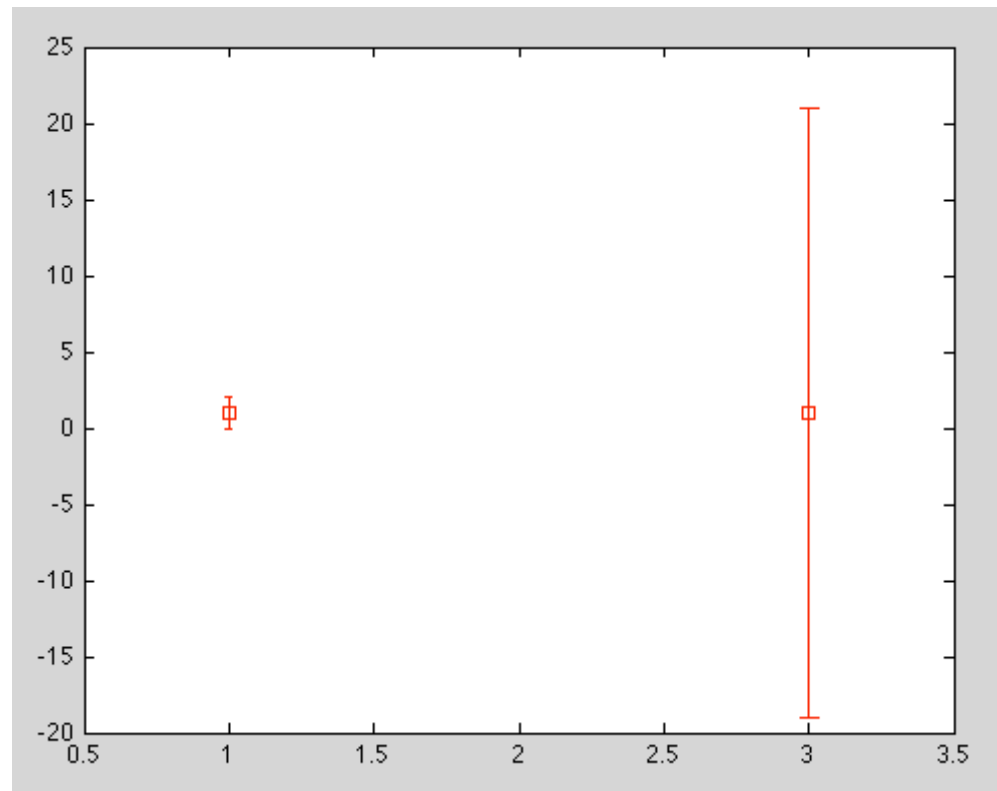
Standard Deviation

- Tells you how much variation there is in your data

Standard Deviation

- For values $\{a_1 \dots a_n\}$, with mean a_m
 $\text{sqrt}(((a_1 - a_m) + \dots + (a_n - a_m))/n)$

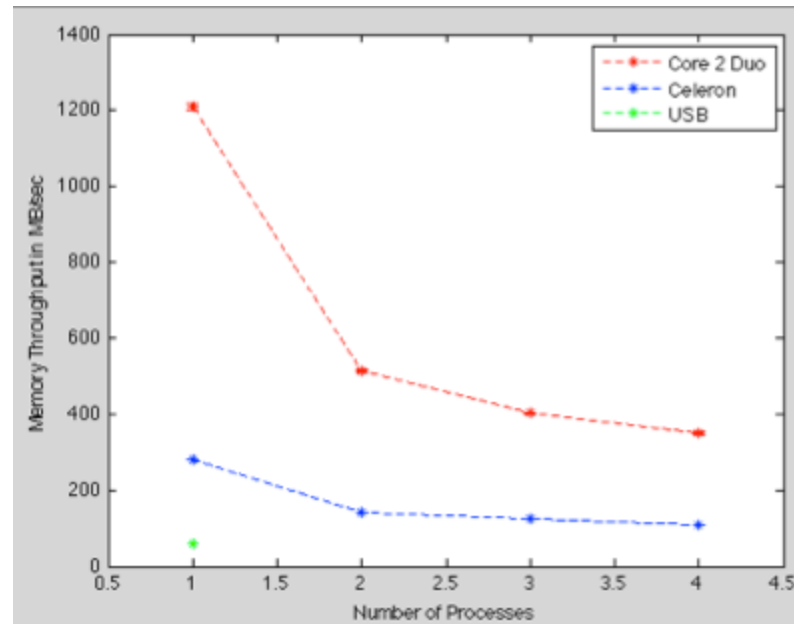
Standard Deviation



Other Metrics

- Min/Max
 - Explain outliers
- Probability Distribution of Data
 - Normal, Power law, Binomial
- T-test
 - Test for significance of results

Show Trends



Contextualize Your Results

- “It took 30 milliseconds to display a frame of video”
- “It took 30 milliseconds to display a frame of video, which is in keeping with current video rates of 30 frames per second”
- “It took 30 milliseconds to display a frame of video, in comparison to other current systems which take 50 milliseconds.”

Always Include

- Sample Size
- Standard Deviation/Variance
- How you performed the experiment