General Feedback

• Milestone Feedback
• Research vs Product
• What is a research contribution?
Why are we giving you so much feedback on milestones?
Why are we giving you so much feedback on milestones?

• We are jerks
Why are we giving you so much feedback on milestones?

- We are jerks
Why are we giving you so much feedback on milestones?

• We are jerks

• We want your projects to be awesome.
Why are we giving you so much feedback on milestones?

- 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

- Technical Solution: 33%
- User Study/Evaluation: 33%
- Design Space: 33%
ZebraNet

- Technical Solution: 80%
- User Study/Evaluation: 15%
- Design Space: 5%
Where Abouts Clock

- Technical Solution: 15%
- User Study/Evaluation: 75%
- Design Space: 10%
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 \( \{a_1 \ldots a_n\} \), \( (a_1 + \ldots + a_n)/n \)

- **Median**
  - For (ordered) values \( \{a_1 \ldots a_n\} \), \( a_{n/2} \)
Standard Deviation

- Tells you how much variation there is in your data
Standard Deviation

- For values \(\{a_1 \ldots a_n\}\), with mean \(a_m\)

\[
\sqrt{\frac{(a_1-a_m) + \ldots + (a_n-a_m))/n)}
\]
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