

Presenting with Power: Effectively and Dynamically Communicating Technical Info



Kevin Johnson

Based on material by
Christina Bourgeois

Undergraduate Professional Communication Program
Georgia Institute of Technology
School of Electrical and Computer Engineering

80% of Your Presentation Will Be Forgotten

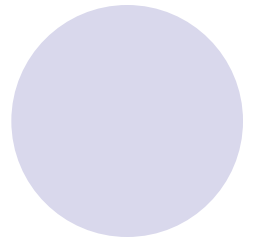
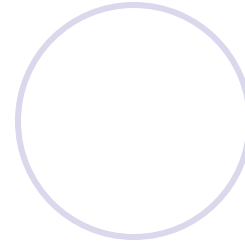
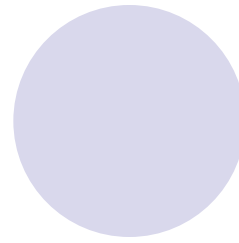
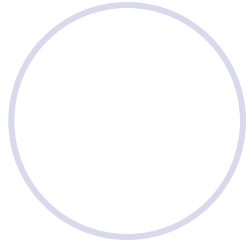
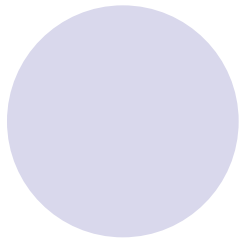


- People tend to remember:
 - Tone
 - Pace
 - Nonverbal expressions
- If you want any of your technical content to be remembered, you need to make it as accessible as possible.

Today's Objectives



- Presentation content
 - What to include and what to leave out
- Slide and speaker aesthetics
 - Aesthetic considerations for slides and speakers
- Performance do's and don'ts
 - Effective presenting tips



Content of a Technical Presentation

What, Why, and How?



- The purpose of a design presentation is to summarize:
 - **WHAT** your technical approach was
 - **WHY** you chose that approach
 - **HOW** you implemented the design
- Notice that the focus is on the **solution**, not the problem.

Customize Content and Style for the Audience

- Who will be the audience?
- What are their expectations?
- Will this material be new to them, or will it build upon prior knowledge?
- How many attendees?
- Will the talk be interactive?
- How much time is allotted for the talk?

Answers to Previous Questions For Your 2031 Presentation



- You are presenting to your peers, TAs, and either Dr. Collins or Kevin.
- We want to hear about your unique solution.
- 15-20 people, in the lab.
- You will not be interrupted; questions at the end.
- You have 10 minutes max (will be cut off).



Planning Your Presentation

- Decide what key points you want your audience to remember.
- Structure your talk around those points and find ways to illustrate them.
- Have a clear beginning, middle, and end to your talk.

Content Guidelines for a Design Presentation

- Title slide (use highly descriptive title)
- Problem Statement or Objective/Goals
- Technical Approach
- Results
- Discussion and Conclusions
- Future Work
- Note that these are guidelines, not slide titles or even fixed sections.



Provide Technical Details

- Quantify!
- Your audience is technically-oriented.
- Show numbers, data, units of measurement, equations.
- Don't just describe what you did,
Explain how and why you did it.

Design Tradeoffs



- Every design involves decisions to use one method over another.
- What are the advantages and disadvantages to your team's design?
- Quantify!
 - Speed, memory/space usage, functionality, robustness, ease-of-use, cost.

Project and Demo Results

- Results are things that can be measured.
 - Seconds, meters, dollars, bytes, hertz, success rates, points, etc.
 - Not whether something is good or bad; save that for the discussion.
- Should include your final demo results.
 - You will have a few minutes to update slides.



Problems Encountered

- An effective design presentation does more than just summarize the technical approach.
- Explain problems or issues with the design.
- Discuss debugging and troubleshooting.
 - These are extremely important engineering skills.
- Your peers likely had similar problems and will be interested in your solutions.



Appropriate Problems

- Good:

- What part of the design was the most conceptually or technically difficult, and how did you solve it?
- What part of the design required the most testing to get right, and how could that have been shortened?

- Bad:

- Blaming tools: “The [thing] just doesn’t work right.”
- Blaming time: see Parkinson’s Law
- Blaming people: awkward and inappropriate

Discussion and Conclusions

- Relate your design back to the project requirements and draw conclusions about the final result.
 - Proposed vs. Actual: what did you change, why, and how did it affect your final product?
 - Strengths and Weaknesses: is your design particularly good in some areas? Are there areas that you know could be better?

Avoid Vague Conclusions

- Bad:

- Hardware design is a complex challenge.
- Teamwork is vital to group project completion.
- We should have started more work earlier.

- Good:

- What improvements, to which part of the design, would have the greatest effect on performance?

Discuss Future Work

- Explain aspects of the design that could be improved (what *and* how). Be specific.
 - How could your design be optimized, given additional functionality, made more intuitive or more robust, etc.
 - Likely based on weaknesses from earlier slides.
- Not useful: “Improve algorithm.”
- Useful: “Taking samples in more diverse lighting conditions could reduce the false-positive rate of the current algorithm.”

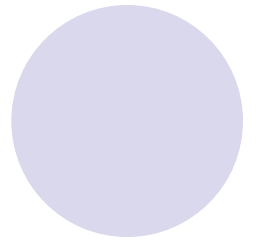
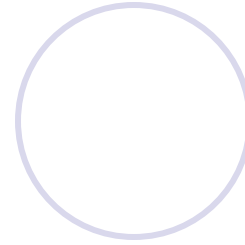
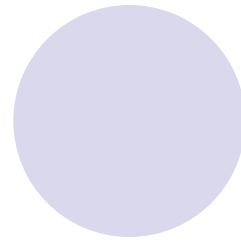
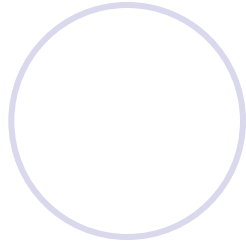
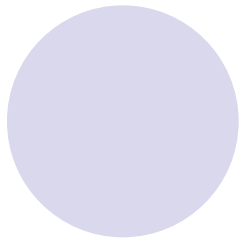
Useful Future Work



- Future work should be both useful and realistic
- Not useful: “Make the robot play music.”
- Not realistic: “Add LIDAR to the robot.”
- Useful and realistic:
 - “Use active control to turn the robot more slowly during sonar acquisition.”
 - “Add audible cues when objectives are completed to enable easier progress monitoring.”

Useful Information in General

- Consider what the audience wants from a brief, 10-minute presentation.
- No: Speed value of 250
 - Better: medium speed / about 0.25m/s
- No: Call subroutine GetSonVal5
 - Better: Get distance from right-side sonar
- No: Send 0x03 to I/O address 0x0A
 - Better: Beep



Visual Style Guidelines for PowerPoint Presentations

General Slide Style




- Include a descriptive title/heading on every slide.
 - Avoid titles with “continued” etc.— reorganize the content and use a descriptive title.
- Keep slides simple and uncluttered.
 - Use short phrases, not long sentences.
- Number your slides.

Slide Consistency

- Use the same capitalization and punctuation on all slides.
 - End sentences with punctuation or leave it off.
 - Capitalize either the first word or every word of slide titles.
- Use consistent verb tense and sentence structure within each slide.
 - Different slides can have different tense.

Choosing a Font

Easy to read:


Sans Serif → 

Bold

Examples:

- Arial
- Helvetica
- Tahoma

Difficult to read:

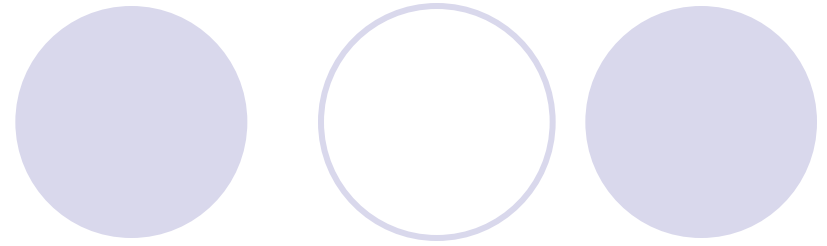
Serif → 

Italics

Examples:

- Times New Roman
- Baskerville Old Face
- Lucida Bright

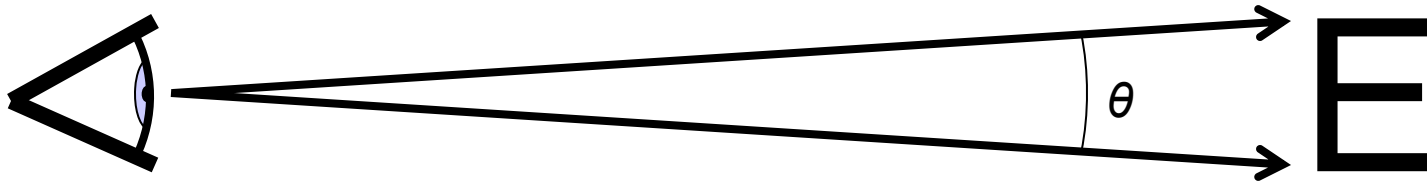
Font Guidelines



- Avoid distracting or unprofessional fonts.
 - E.g. **Comic Sans**, *Papyrus*, or *any script font*
 - These slides use Arial
- Title font size 36-44 (these use 40, bold).
- Body text font size 24-32. This is 32.
 - This is 27.
 - This is 24. Never go smaller than 24.

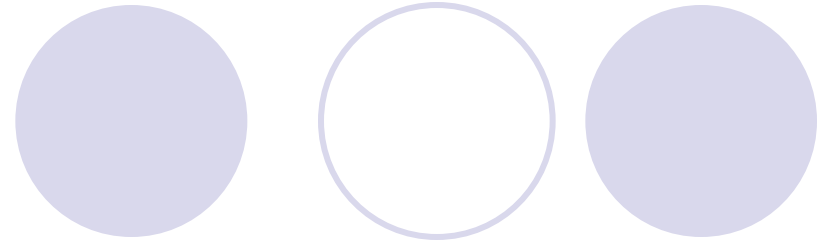
Basis for Font Size

- People with 20/40 vision can read letters at about 0.2° of field of view.
 - Usually around 24pt font.



- Consider that an absolute minimum.
 - Bigger is always more readable.
 - Don't make people squint.
- This applies to figures as well!

Filling the Slide



- If a slide is light on material, spread the bullets out and/or use a larger font.
- Having lots of empty space makes a slide feel top-heavy and leaves the audience wondering if something is missing.

Creating Emphasis

- **Color** is a very useful tool for **emphasis**.
 - But ensure that the color doesn't make it **hard to see**.
- Underline and *Italics* are also effective to pull words out.
 - *Just be careful that your font doesn't get too thin.*
- **Bold** is not very effective for **emphasis**.
 - It's sometimes **difficult** to tell **which words** are bold.

Upper and Lower Case

Five circles are arranged horizontally at the top of the slide. From left to right, the first, third, and fifth circles are solid light purple. The second and fourth circles are white with a light purple outline.

- A MIXTURE OF UPPER AND LOWER CASE AIDS IN READING TEXT QUICKLY AND ACCURATELY.
 - All caps is NOT EFFECTIVE, even for emphasis.
 - And it looks like you're shouting.

Colors and Contrast



- White background with dark text is the norm at professional conferences.
- Dark background with light text is also acceptable, but tends to thin lines, so be careful.
- Never use medium backgrounds, as the contrast will depend on the projector at your venue.
- Gradient backgrounds are even worse, as text will invariably blend in at some point.

Special Effects and Display Speed

- Special effects for no reason are not acceptable in a professional presentation.
 - It is possible to use them effectively, but make sure there's a reason for it before including them.
- They are distracting for the audience, and confusing for you. **Surprise!**
- Also, people don't want to be fed information bullet-by-bullet. Put all the information up at once.

Showing vs. Telling

- Make use of visuals wherever possible!
- People like to see what you're doing:
 - Diagrams, photos, flow charts, tables.
- Use words when a concept can't be shown, or to help describe the visual.
- Make sure the graphics are actually related to your presentation.

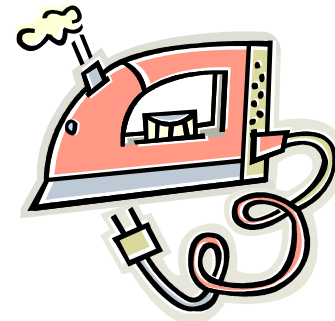


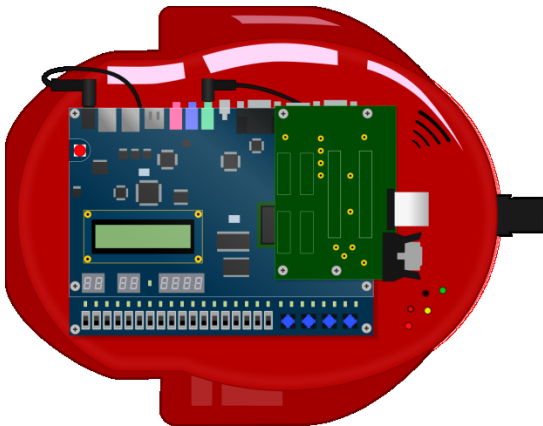
Diagram Considerations



- Keep diagrams simple and easy to understand.
- Ensure that lines are thick enough to be visible when projected.
- Make text large enough to be readable.
- Guide the audience to the important aspects of the diagram by using a pointer or standing by the screen and using your hands.

Photos vs. Diagrams

- Photographs of shiny or bright things don't show up well.

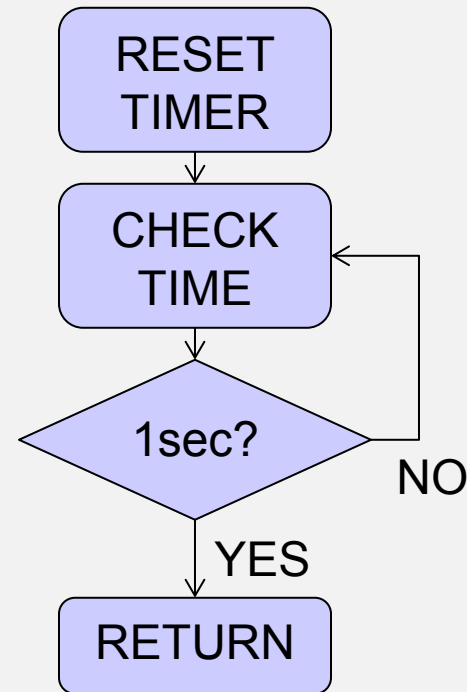


Code vs. Diagram

- Code is too difficult to understand at presentation speeds. *Especially ASM code.*

```
; wait 1 second
Wait1:
    OUT        TIMER
Wloop:
    IN         TIMER
    ADDI       -10
    JNEG       Wloop
    RETURN
```

NO



YES

Showing Data Effectively

NO

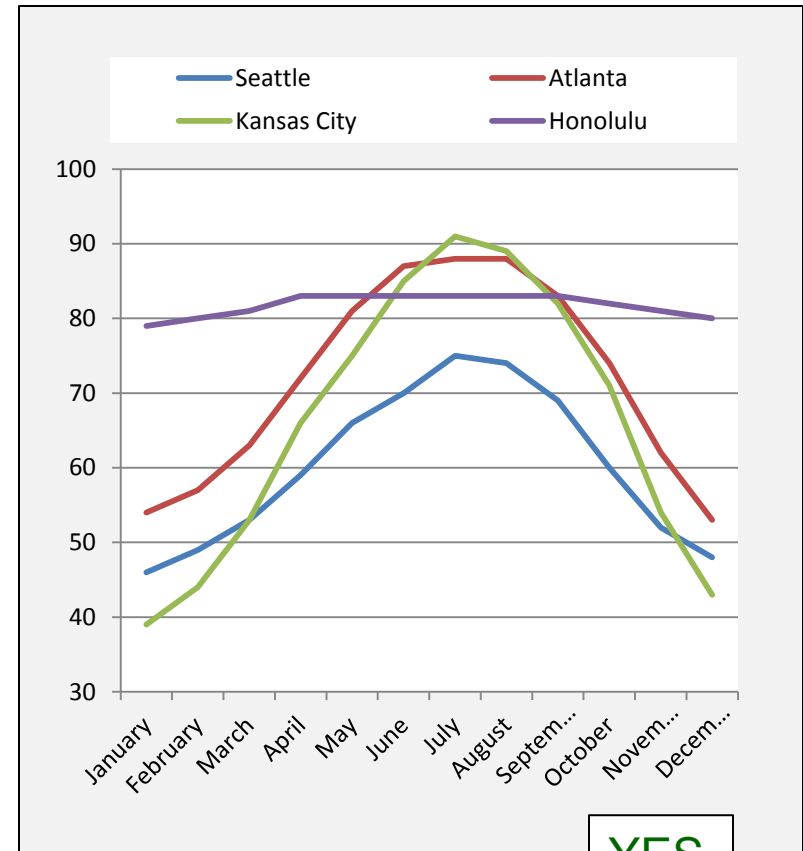
Average monthly high and low temperatures in four U.S. cities

	Seattle	Atlanta	Kansas City	Honolulu
January	46/37	54/36	39/22	79/70
February	49/38	57/37	44/26	80/71
March	53/40	63/41	53/33	81/73
April	59/44	72/50	66/45	83/74
May	66/49	81/59	75/55	83/74
June	70/53	87/66	85/66	83/74
July	75/56	88/69	91/71	83/74
August	74/56	88/68	89/69	83/74
September	69/53	83/63	82/60	83/73
October	60/48	74/52	71/49	82/73
November	52/48	62/40	54/35	81/72
December	48/39	53/35	43/27	80/71

Average high temperatures for winter months in four U.S. cities

	Seattle	Atlanta	Kansas City	Honolulu
January	46	54	39	79
February	49	57	44	80
November	52	62	54	81
December	48	53	43	80

MAYBE



YES

Figure Borders and Backgrounds

- Figures with no border, background, or outline can be difficult to distinguish from other information on the slide.

Average high temperatures for winter months in four U.S. cities

	Seattle	Atlanta	Kansas City	Honolulu
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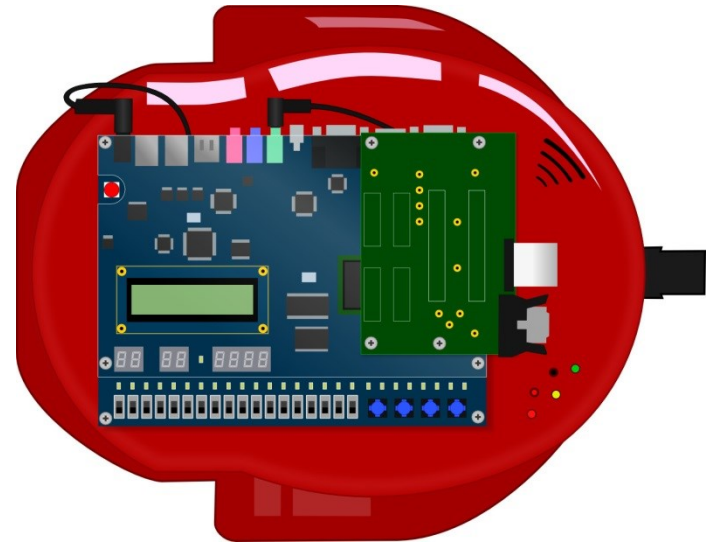
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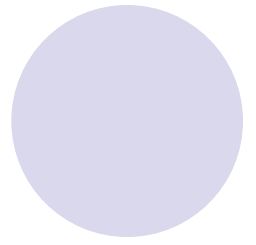
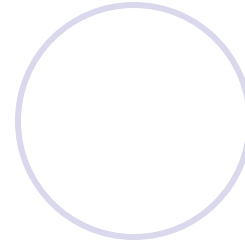
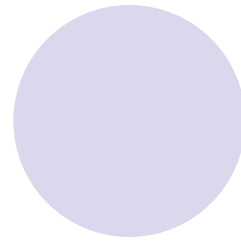
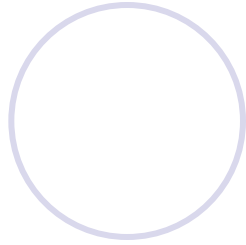
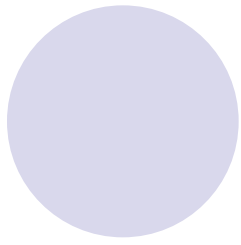
Citing Sources

- Most information will be your own, but if you need to cite something, you can do so informally.

-Kevin Johnson, *Effective Technical Presentations*

- Images are also easy to cite.





Examples of Good and Bad Slide Content

Methods for Quantifying Changes in Diffuse Ultrasonic Signals with Applications to Structural Health Monitoring

**Jennifer E. Michaels, Yinghui Lu, and
Thomas E. Michaels**

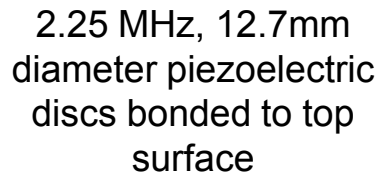
Good

Georgia Institute of Technology
School of Electrical and Computer Engineering

10th SPIE International Symposium
Nondestructive Evaluation for Health Monitoring and Diagnostics

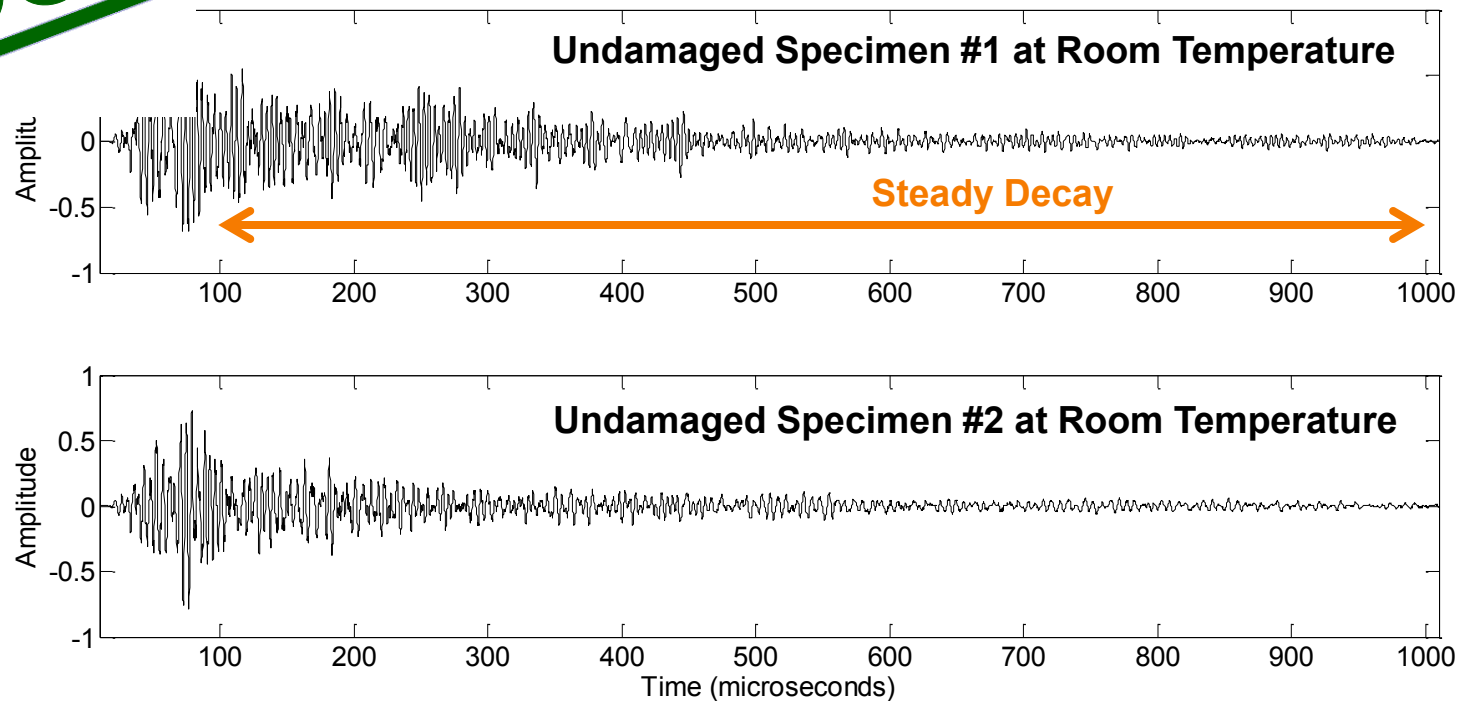
March 6-10, 2005

Good



Ultrasonic Signals from Nominally Identical Samples

Good



Labels, annotations, and units.

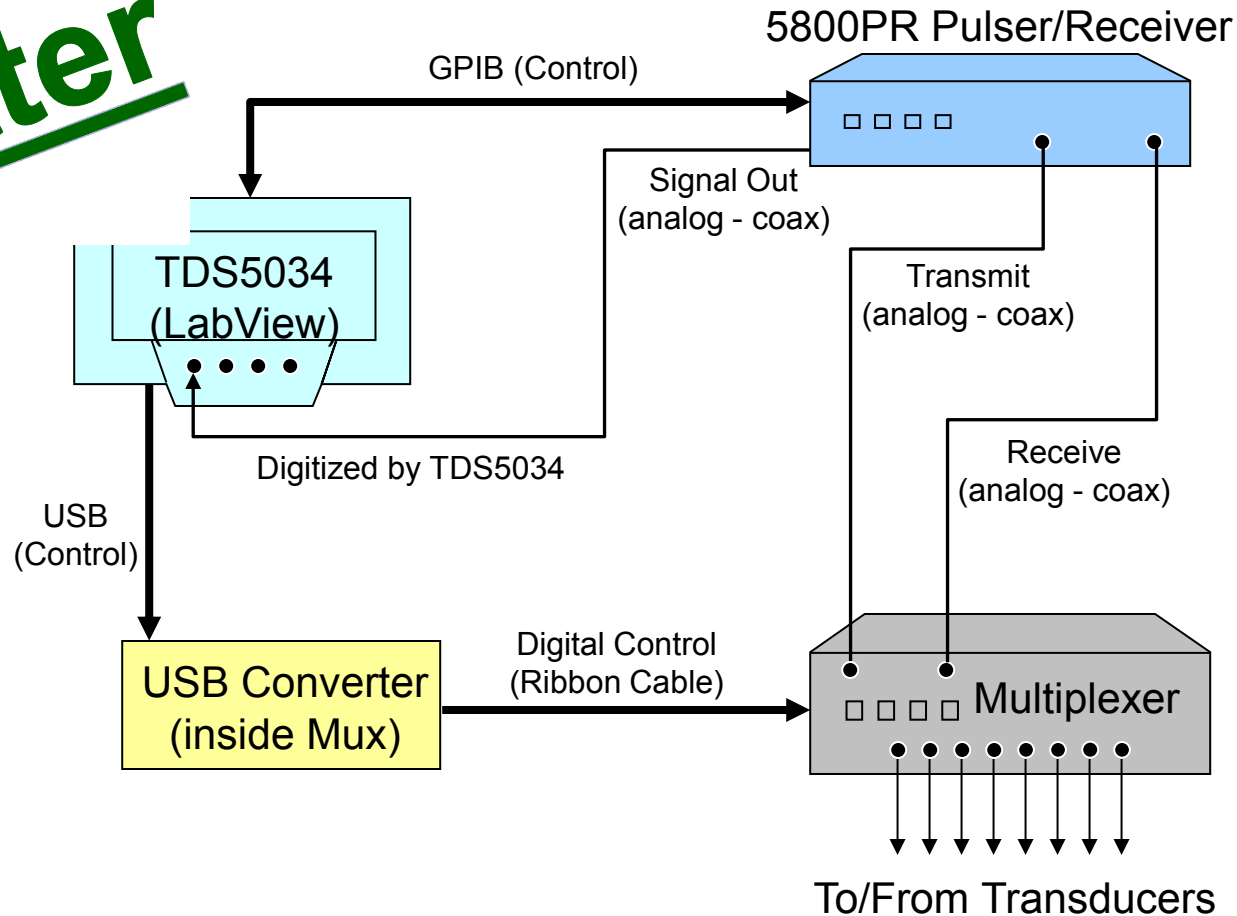
System Description

Text-heavy

- PC-Based Oscilloscope (TC)
 - Controls multiplexer via USB
 - Controls pulser-receiver via GPIB interface
 - Runs LabView
- Pulser Receiver
 - Signal output goes to scope input and is digitized
 - Transmit and Receiver are connected to the Mux
- Eight Channel Multiplexer
 - Supports up to 8 transducers
 - Routes Transmit and Receive to/from transducers
 - USB interface with scope PC

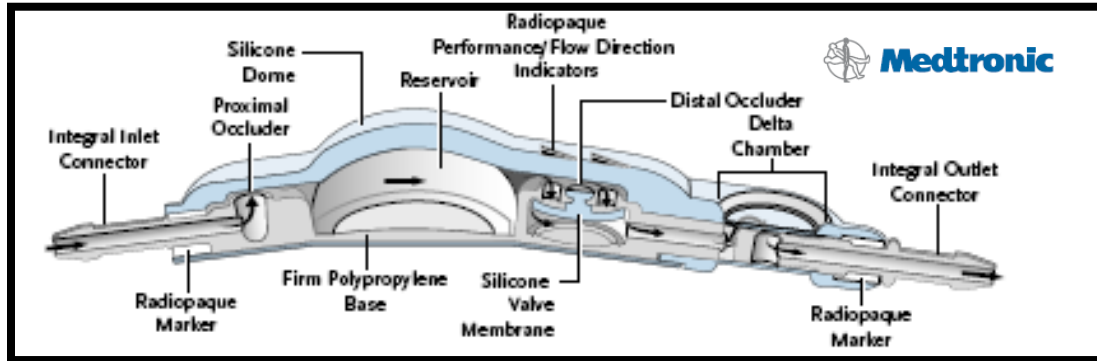
System Block Diagram

Better

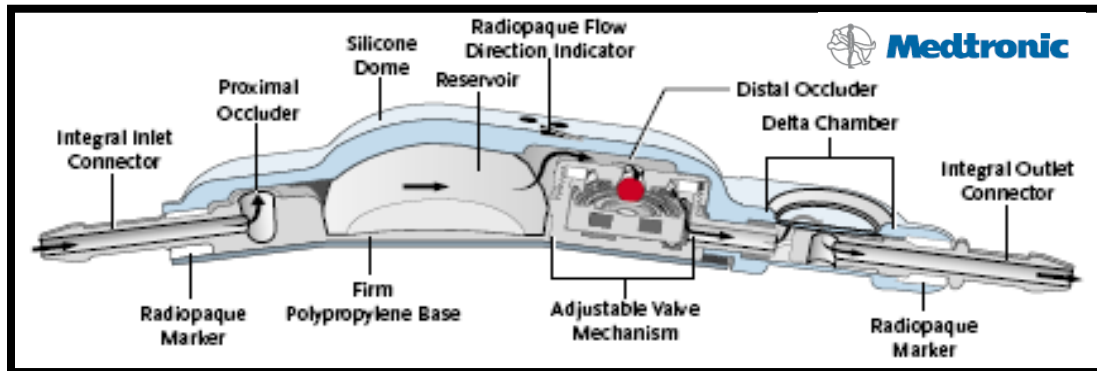


Valve Components

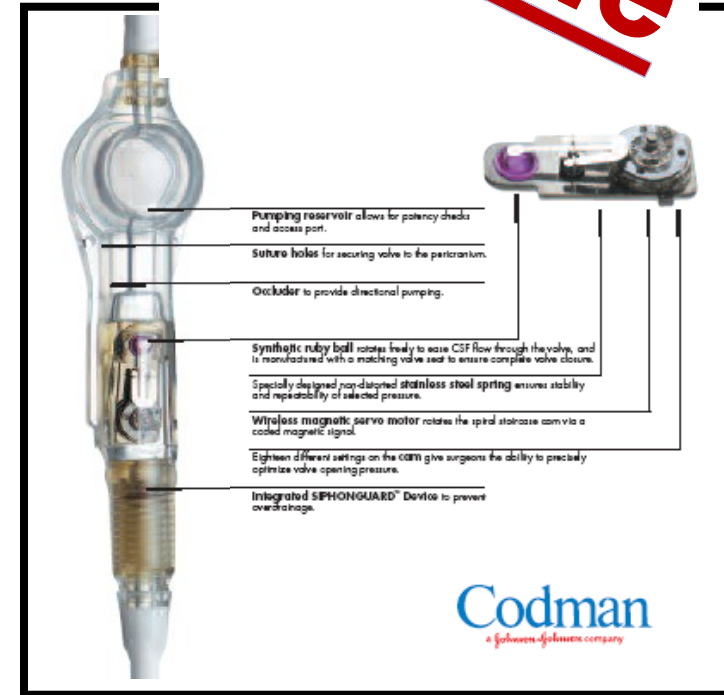
Illegible



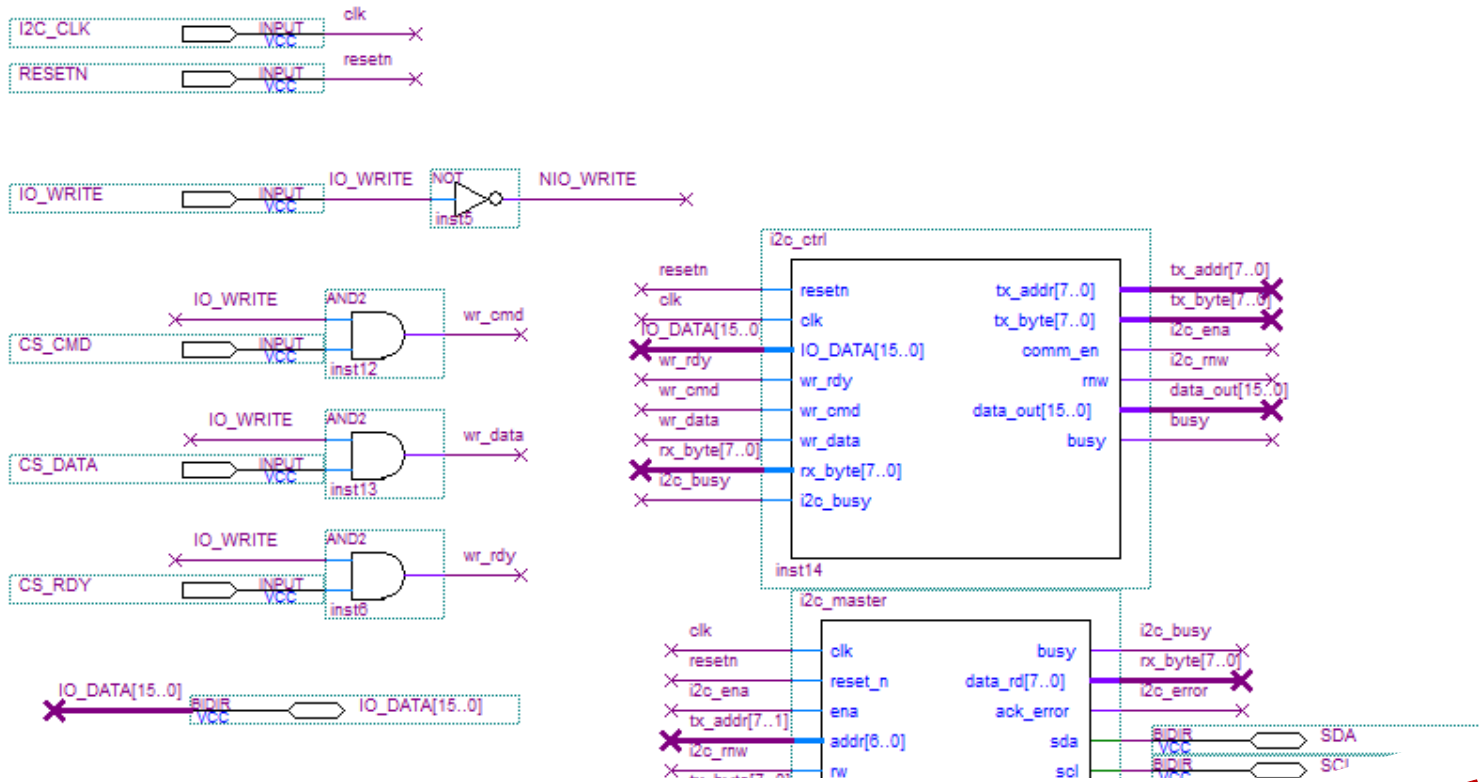
Medtronic Delta Valve



Medtronic Strata Valve

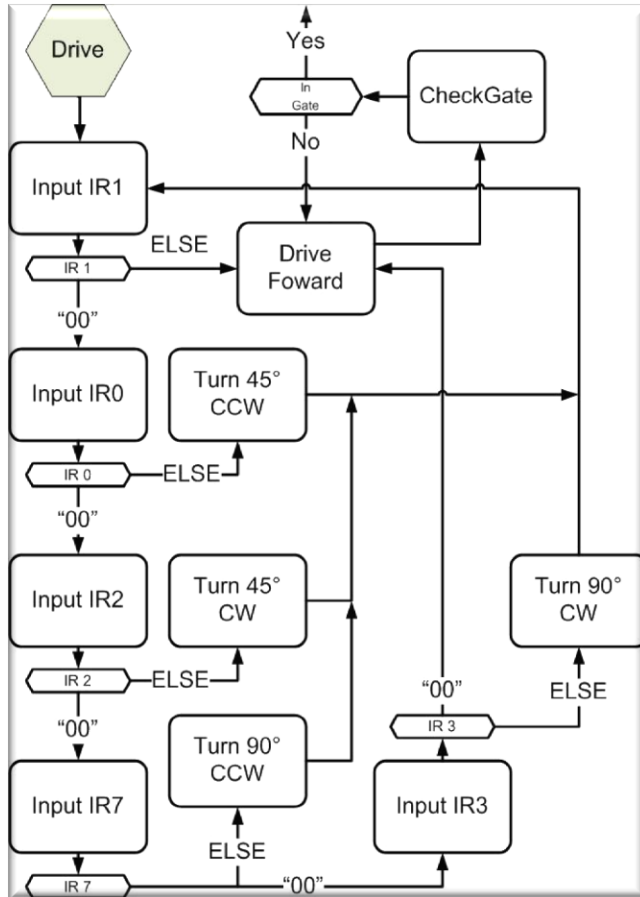


Codman Hakim Programmable Valve



Too detailed, too small

Flow Chart



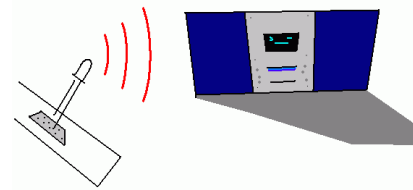
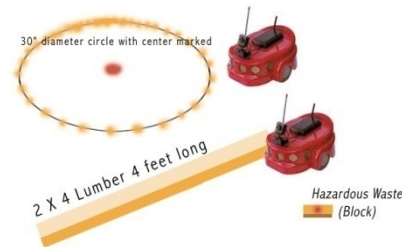
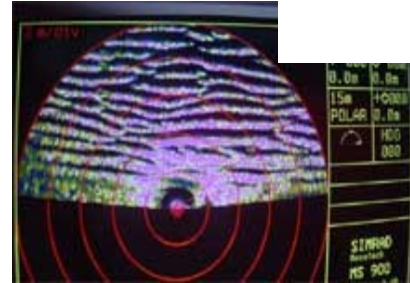
Poor slide title

**No context
or description**

Project Objectives

Vague

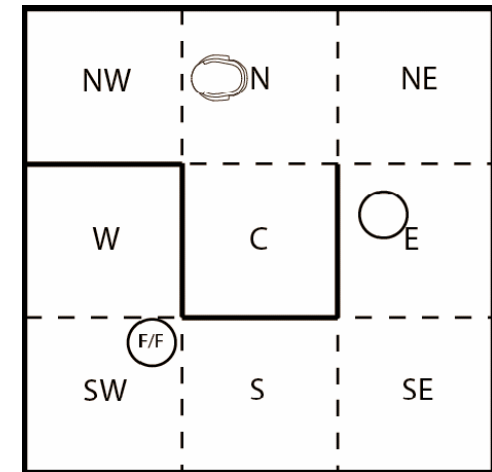
- Follow the wall
- Avoid collisions
- Detect beacons
- Finish safely



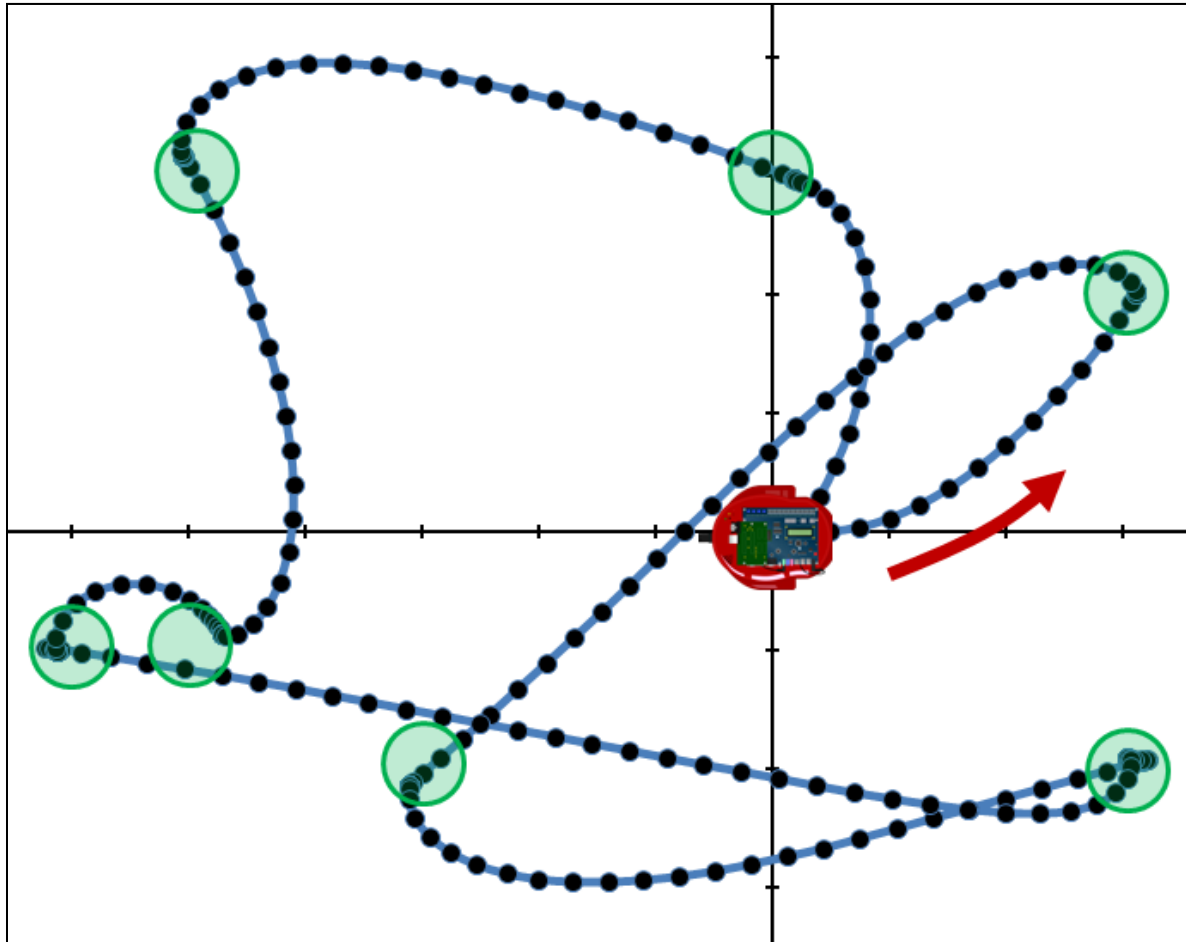
Primary Project Objectives

- Instruct robot to independently patrol a given walled area.
- Identify and react to friend, foe, and neutral beacons.
- Avoid collisions with walls and beacons.

Better



Full-scale Test Results



(representative trial)

Three trials:

- Run distance:
38.9 feet
- Average time:
65s
- Worst error:
3.9"
- Average error:
2.1"

Sonar



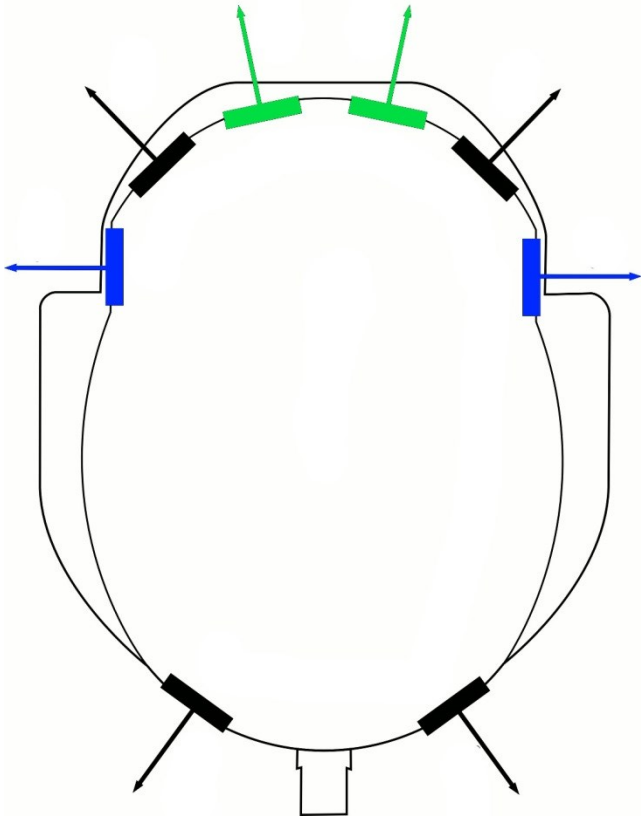
- DIST0 and DIST5 measure distance to wall
- DIST2 and DIST3 look for other walls

Quality info

Overly-detailed image

Sonar Utilization

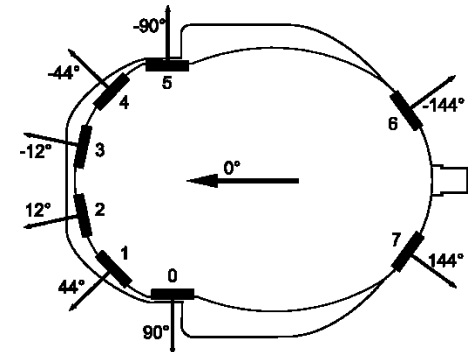
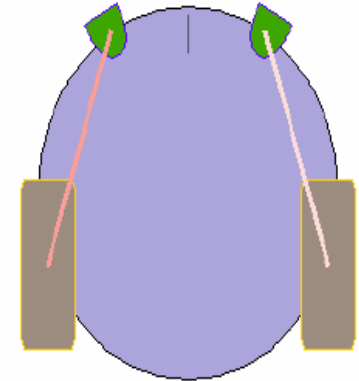
Better



- Side sonar used to follow wall
- Front sonar used to prevent collision

Overview of Robot Navigation

- Uses Braitenberg positive feedback fear method to avoid obstacles.
- Reads sonar sensors continually to locate objects that come within 350mm.
- Processes sensors in prioritized order, from front to sides (rear sensors ignored).



Good technical details

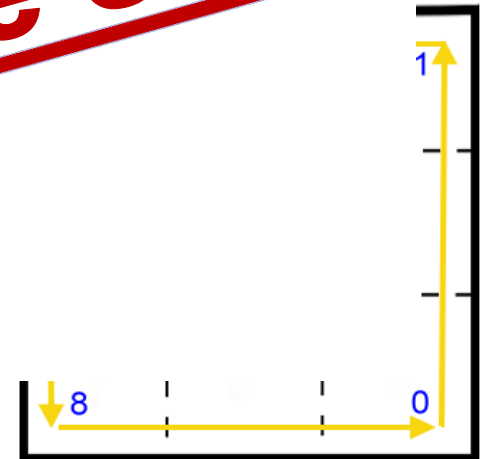
Too Much Text is Overwhelming

- Method 1 used Pythagorean theorem and law of cosines - failed in design
- Method 2 used state transition table with known area values— failed in test
- Me

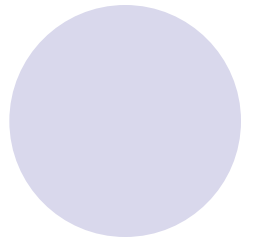
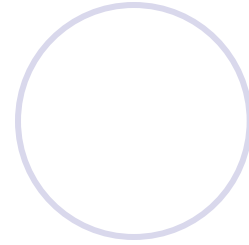
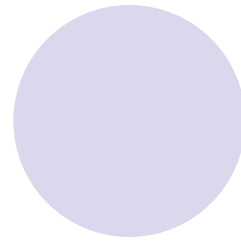
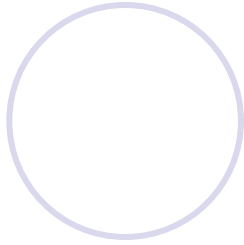
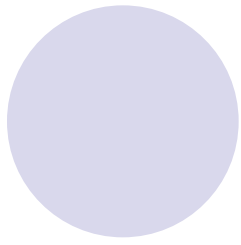
$$D = \sqrt{\frac{(xy \cos m - \frac{x^2 + y^2}{2})}{(x^2 + y^2 - 2xy \cos m)}}$$

1	2	3
4	5	6

Pre Room						
6						
6						
2						
2	3	S	6	Same	s3 < 8', s6 < 4'	



Too much for one slide



Presenter aesthetics

Looking as Good as Your Slides

- Dress “business casual” for your presentation.
 - You will soon be going to interviews, if you are not already. Use this opportunity to get comfortable being in the spotlight in business attire.
- Think conservative.
- Men—white t-shirt under button down or polo shirts, slacks.
- Women—slacks or knee length skirts, moderate heel, minimize accessories.

Examples for Men



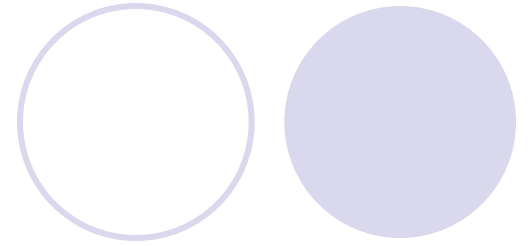
Examples for Women



Unprofessional Business Attire



Fine for “Going Out” Not for Going to Work

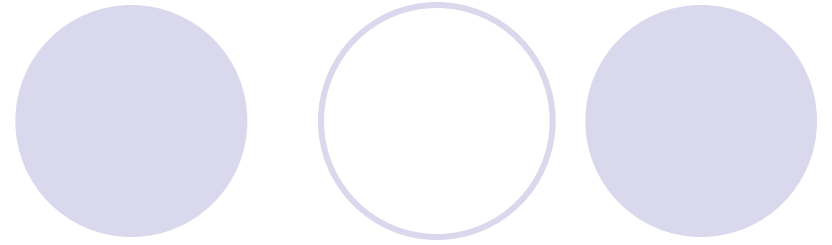
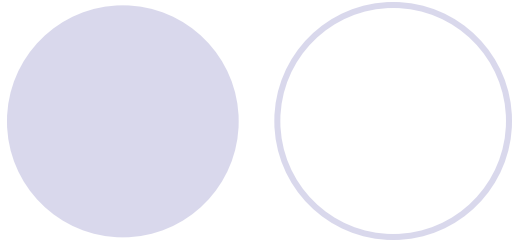


Avoid Sloppy or Ill-fitting Clothes



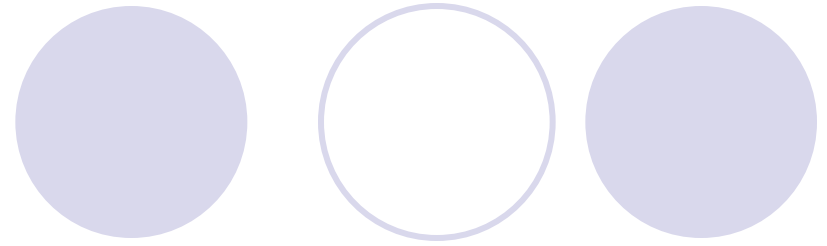
Business Formal – OK but not required for 2031





Good Practices for an Effective Presentation

Giving Your Talk



- 10 minutes is a short, formal talk.
 - Not enough time to say everything about your project.
 - Must plan your comments for each slide.
 - Stick to your plan – don't digress.
- Don't read the slides to the audience – slides should be used as prompts, not as a script.
- Remember to project your voice, maintain eye contact, and avoid filler words (umm, ahh, like).

Performance Techniques



- Take a few deep breaths.
- Stand up straight – pay attention to your posture.
- Make eye contact with your audience – scan.
- Project your voice.
- Pace your speech to be natural and moderate.
- Monitor your gestures and avoid habitual behaviors: hands in pockets, hand-waving, playing with your hair, pacing, swaying...

Presentation Nevers



- Never run over your time limit. You will be cut off and be unable to finish your presentation.
- Never make a big deal about mistakes.
 - If something goes wrong, just move on.
- Never respond sarcastically or aggressively to a question or comment.
 - The audience will resent you for picking on that poor questioner.

Top 5 Points of Advice



5. Tour the space you'll be presenting in prior to your talk.
4. Make sure the venue's technology is compatible with yours.
3. Stand in an open area instead of behind the podium.
2. Use the pointer or cursor sparingly.

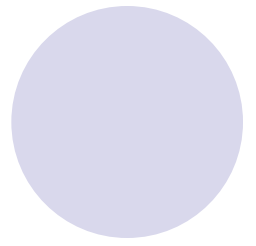
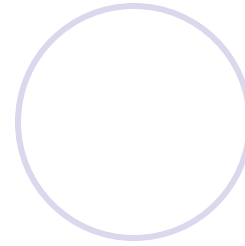
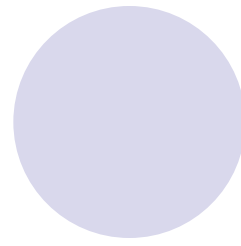
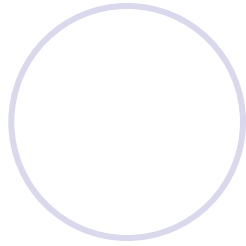
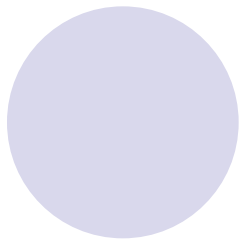


And Most Importantly...

Practice!

A lot!

(seriously)



Questions?