Project Documentation Presentation

Fall 2008
Outline

- Purpose
- Types of Documentation
  - Individual Documentation
  - Project Documentation
  - Team Documentation
- Summary
Purpose

- Documents the work that you do throughout the semester
  - Grading
  - Personal record
  - Future teams and team members
Overview

- Three main categories of documentation:
  - Individual Documentation
    - Design Notebook
    - Individual Memo
  - Project Documentation
    - Design Process Documents
    - Design Review Documentation
  - Semester/Team Documentation
    - Semester Plan/Project Proposal
    - Final Report
Individual Documentation: Notebook

- Record of your individual work
- All work should be in or referenced in your notebook
  - Actual entries
  - References to other documentation
- Notebook is your thinkpad
  - Record thoughts, ideas, research, etc.
Individual Documentation: Notebook Mechanics

- Bound, composition style notebook
  - Spiral bound notebooks are not acceptable
  - All first semester students should have received one at first lecture
- Include name, email, phone number and team name on the front cover
- All entries should be in ink
- Tape, staple, or glue any sheets that you want to include in the notebook
  - Referencing is better
Individual Documentation: Notebook Mechanics

- All pages must be numbered
  - Good idea to keep a table of contents
- Sign and date each entry
- Cross out any large amounts of blank space
- DO NOT erase or remove any pages from the notebook
  - If you make a mistake, simply cross it out
Entry Format:
- Title
- Date and time
- Duration
- Who was present
- Location
- Objective
- Procedure
- Results
- Conclusions
- Reflections
Individual Documentation: Notebook Content

- Everything that you do should be documented in your notebook
  - Pertinent information from lectures
  - Lab meetings (agendas, minutes)
  - Contact list
  - Individual work
Individual Documentation: Notebook Content

- Record any thoughts you may have about your project, no matter how strange it may seem
- When doing research, site where any information you acquired came from
- Explanations of design decisions are essential
Individual Documentation: Notebook Content

- When doing testing, show setups and record data
  - Create tables with data
  - Draw or print waveforms
  - Draw how you had the project attached to the measurement devices
- Give narrative explanations for your work, don’t just put down calculations or data
Individual Documentation: Notebook Content

- Make references to outside documentation and give locations
  - Design documentation, spec sheets, code, etc
- Attach any correspondence you have with outside sources
- When attaching loose sheets in the notebook, label the loose sheet and provide an explanation for its purpose
Individual Documentation: Notebook Content

- Design material from notebooks is required to be put in the design documentation
  - If you think it's worth being graded, it should be in the design documentation
  - Should put design decisions and explanations, actual design and calculations, results from testing, etc in design documentation
Individual Documentation: Notebook Grading

- Notebooks will be graded twice during the semester
  - Week 8 and 16
  - Week 4 to give feedback (all students)
- Grade breakdown is as follows:
  - Content (75 %)
    - Project Work
    - Process
    - Critical Thinking
  - Format (25 %)
    - Readability and clarity
    - Entries for group meetings
    - Dated entries, pages numbered
    - Loose pages attached, entries in ink
Individual Documentation: Notebook Grading

- You will receive either an:  
  - A, B, C, D, F

  for each of the categories listed above

- Overall notebook grade will be based on the same scale

- Grading guidelines are on the website:  
  http://epics.ecn.purdue.edu/guidelines/
Individual Documentation: Notebook Grading - Project Work

- Entries showing work accomplished on the project
- Types of information:
  - Results of research
  - Calculations
  - Drawings (circuit diagrams, CAD drawings)
  - Test procedures
  - Test setups
  - Results
  - Citations of documents created
Individual Documentation: Notebook Grading - Process

- Entries showing evidence of the design process
- Types of Information:
  - Plans for project work
  - Identification of tasks
  - Distribution of work
  - Design decisions
  - Problems encountered and overcome
Individual Documentation: Notebook Grading - Critical

- Entries showing in-depth thinking about the issues related to the project, your team, the community, or the needs you are addressing
  - Some regular reflection activities in lab ("Question of the Week" discussions)
  - Should also spend time outside of lab reflecting on project and related issues
Individual Documentation: Notebook Grading - Critical

- Types of Information:
  - Customer requirements and changes
  - Safety considerations
  - Intellectual property
  - Maintenance issues
  - Societal issues related to your project
  - Team issues
  - Your role within the project, team, profession, etc.
  - Development in pursuit of learning objectives, such as lifelong learning, teamwork, ethics, etc.
  - Unanswered questions
Individual Documentation: Notebook Grading - Formatting

- Document lab meetings by inserting agendas
- Group meetings:
  - Lab meetings
  - Project team meetings
HEART WORK 1/18/06

I worked with [name] to test the comparator circuit with the sensor. We ran into a problem with the sensor, what we thought was the heart beat signal was actually a modulated signal. The output from sensor:

Output from sensor:

what we thought was heart beat signal

actual heart beat signal

The output from the sensor is modulated so that when there is a heart beat, an oscillating output is given and when there is not a heart beat the signal is grounded.

We tried taking the sensor off its circuit board (to remove the modulated signal), but the sensor broke. We then bought a pair of infrared emitter and detector from Radio Shack.

Infrared Detector - clear packaging

Schematic

PACKAGE

Infrared Emitter - blue packaging

Schematic

PACKAGE

TEST CIRCUIT

We were not able to get a consistent or meaningful signal from this test circuit. We tried modulating the VCXO for the VM60, but the results were no better.
Research on Ext Mic input 11/24

Today I did some research on XLR connectors. XLR connection will appear in the Ext Mic:

An XLR connector is a balanced input. In this way, two pins carry signal 180° out of phase, while the third pin is ground.

(From homerecording.about.com/main/news/pass...)

Another website (documents.epics.purdue.edu/documents/groundloop/audiocircuit-grou.html) suggests the use of a differential amplifier. Also, the site warns to make sure you show the same input impedance to both inputs.

Differential Amplifier Sketching

From 201 bank

\[ V_{out} = V_{+} \left( \frac{R_4}{R_3 + R_4} \right) \]

\[ V_{out} = V_{2} \left( \frac{R_4}{R_3 + R_4} \right) \]

\[ V_{out} = V_{2} \left( \frac{R_4}{R_3 + R_4} \right) \]

Need eqns for input impedance

Seen by \( V_{+} \):

\[ R_{eq} = \frac{R_4}{R_3 + R_4} \]

Seen by \( V_{2} \):

\[ R_{eq} = \frac{R_4}{R_3 + R_4} \]

Since these should match \( R_1 = R_3 \)

\[ R_{in1} = R_1 \]

\[ R_{in2} = R_3 \]
On 15/10, we started working on the circuit. At first, the new low circuit didn't work. No surprise, we'll debug.

We changed all R to ground, apparently the 300 ohm was off by 10x, not 100x, as the spec sheet required. By looking at the output signal, we can explain the behavior is not linear and is double sided and only clipped when large

One solution was to reduce the gain on the other side and now the signal seems to be adjustable. We need to adjust the gain on the other side.

I've sent some diagrams that need to be made. I'm sending you the circuit diagrams. We'll get those in.

Also, I've sent some answers to help.

I'm going to meet [name] tomorrow for a project review meeting.
Sept 29
worked on my section for
the tutorial. I am about
half way through the
instructor for a different
set up.
Individual Communication: Individual Memos

- Need to be completed 4 times during the semester (weeks 4, 8, 12, and 16)
- Graded twice times (week 8 and 16)
  - Will receive feedback at week 4 and 12

- Identify responsibilities as skill sets for semester
- Document accomplishments toward fulfilling those responsibilities and developing skills
  - Backup what you say you accomplished with actual documentation
Individual Communication: Individual Memos

- Week 4 Feedback:
  - Looking at whether your responsibilities and skill sets are realistic/appropriate

- Weeks 8, 16 Grading Guidelines:
  - Looking at your accomplishments and whether they’re appropriate

http://epics.ecn.purdue.edu/guidelines/
Project Documentation

- Three main types of documents:
  - Design Process documents
  - Design records
  - Design Review documents
Project Documentation: Design Documentation

6 Phases in EPICS Design Process:

1) Problem Identification
2) Specifications Development
3) Conceptual Design
4) Detailed Design
5) Production
6) Service/Maintenance
7) Redesign/Retire
All information about the project should be able to be found in the design documentation.

EPICS Design process model has 6 (or 7) main phases:

<table>
<thead>
<tr>
<th>Design Process Phase</th>
<th>Deliverables</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project Identification Phase Tasks</td>
<td>- Project Charter</td>
</tr>
<tr>
<td>Specification Development Phase Tasks</td>
<td>- Customer Specifications Document</td>
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<tr>
<td></td>
<td>- Project Specification Document</td>
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<tr>
<td>Conceptual Design Phase Tasks</td>
<td>- Proof of Concept/Rapid Prototype</td>
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<tr>
<td></td>
<td>- Project Conceptual Design Report</td>
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<tr>
<td>Detailed Design Phase Tasks</td>
<td>- Project Detailed Design Report</td>
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<td></td>
<td>- Prototype version of project</td>
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<tr>
<td>Production Phase Tasks</td>
<td>- Delivered project</td>
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<td></td>
<td>- Project Delivery Report</td>
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<td></td>
<td>- Delivery checklist</td>
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<td></td>
<td>- User manuals</td>
</tr>
<tr>
<td>Service/Maintenance Phase Tasks</td>
<td>- Fielded Project Report</td>
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<tr>
<td>Retirement or Redesign</td>
<td>-</td>
</tr>
</tbody>
</table>
Project Documentation: Design Record

- Short report outlining one specific aspect of the design
  - Design of a component
  - Decision process
  - Outlining a process
Project Documentation: Design Review Documents

- Documents sent to reviewers attending your design review
- Should contain current design process document
- Draft due week 9
- Final due week 10 to be sent or made available to reviewers
Team Documentation

- **Semester Plan**
  - States goals for the semester and outlines a plan for accomplishing those goals

- **Project Proposal**
  - High level description of the project

- **Final Report**
  - For Project Partner: Summary of the work completed during semester and plans for transition to next semester
  - For Future Team: Summary of the work completed with some explanation; recommendations for future work based on lessons learned during the semester

http://epics.ecn.purdue.edu/guidelines
Summary

- Documentation is the most important thing you can do in EPICS
  - The real product of design is not the object itself, but the plans to build it
- All aspects (individual, project, team) play a part in your grade
Questions?

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