Presentation Slide Contents

1. Lecture slides on progress report and oral presentation (K. Phang)
2. Sample student presentation slides
3. Lecture slides on ethics review (H. Kunov)

ECE496 Lecture

Looking Ahead to Next Semester

Thursday, Nov. 10, 2011

Khoman Phang
Ken Tallman
Hans Kunov

ECE496 Milestones & Deliverables

<table>
<thead>
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<th>Milestones &amp; Deliverables</th>
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<td>Planning, concept</td>
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<td>Progress Report, Oral Presentation</td>
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Begin with a good plan ...

- maps
- Equipment
- Study terrain
- Avoid pitfalls
Follow through in execution
- Team work
- Testing
- Documenting
- Presenting
- Reporting progress

Notes from Ted Herman
- This is not what we are trained to do
- The task is huge
- Your schedule is probably already wrong
- Set hard limits on the time to decide on tools, platforms, etc.

Agenda
1. Deliverables for next semester
   - Individual progress report
   - Oral presentation
   - Final group report
   - Design Fair
   Lecture on Thurs. March 8th 7PM
   Earth Sciences Bldg ES1050
2. Ethics Review
3. Cleanup

Individual Progress Report / Evaluation – Why They’re There

Project View:
- To allow reevaluation of position and adjustments if required
- To access overall project progress
- To access individual contributions and progress
Individual Progress Report

- A group progress summary plus individual reports
  - Group Progress summary
  - Individual reports (for each student)
- What you have accomplished since the Design Review

Hints for the Progress Report

- Credible (supported) statements about accomplishments (completed & underway)
- Unfinished activities are less comforting (What does “Select processor 50% done” mean???)
- Indicate problems you’ve encountered and overcome through your creativity and hard work.

Wishy-washy ≠ Credible

Background statement → Reference [link to tasks & requirements]
Development Activity done → Test

Example --
“I finished the analog-to-digital conversion routine”
- is it coded?
- does it compile cleanly?
- does it work with some input randomly selected?
- does it work with a carefully-designed set of test cases that cover all operational situations?
- Sample evidence: photos, simulation plots, screen shots, schematics, flow diagrams, etc.

Note: Writing vs. Communication

This is not about writing. This is about communication.

Lists & Tables & Bullets
Categories & other Organization
Figures & Charts
Headings
Boxes
Review progress report guidelines, samples

Tip from Ted Herman

- Keep an “evidence trail” on the work you do. We took too much time on our progress reports because we had to recreate evidence and remember what we had done.

Individual Supervisor Evaluations

- Your supervisor will also evaluate your individual progress in mid-January.

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Oral Presentation - Why It's There

Project View:
- Faster information flow, lower volume than written report; questions possible
- To be able to measure progress
- To inform third parties of project

Oral Presentation Format
- Evaluated but unmarked dry run THEN
- Marked final presentation (by administrator)
- Select dates using Doodle poll
- Bring your own laptop
- Presentation length depends on team size
- Questions from audience

Presentation Format
- Quick flow; low volume
- Avoid a chronological account of your project

Presentation Format
- Quick flow; low volume
- Avoid a chronological account of your project
- Build your presentation around important points, using the grading evaluation form:
  - Motivation
  - Project goals and specifications
  - System overview
  - Progress update
  - Conclusions
Presentation Tips

- Make contact with your audience
- Use pictures, graphs, diagrams!
- With text, stick to key points
- Use informative headings
- Use a manageable number of slides

Presentation Tips

- Make contact with your audience
- Use pictures, graphs, diagrams!
- With text, stick to key points
- Use informative headings
- Use a manageable number of slides
- Make your presentation memorable
Oral Presentation
(Typical structure)

- A title slide
- An outline of the presentation's contents.
- Introduction (explain to those not familiar with your work the background and motivation for your project)
- Objectives (what you set out to do)
- Describe design, accomplishments, & milestones
- Summarize progress and future work
- Conclusions (what you covered in your presentation)

Question: How do you (or can you) rework this and use this to make your presentation interesting and reflective of your enthusiasm in your project, without sacrificing important content???

Sample presentations
(Included after this presentation)

Agenda

1. Deliverables for next semester
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   - Design Fair

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Lecture on Thurs. March 8th 7PM
Earth Sciences Bldg ES1050
To Do List

- Remind supervisors to submit Proposal evaluations online
- Watch for announcements
  - End-of-term meetings (Nov. 30~Dec 1st)
  - Oral and Design Fair information and Time/Venue assignments.

Beyond ECE496…

Design Project Awards & Conferences

AWARDS & RECOGNITION FROM YOUR PEERS!!

Aloha Design Award
Gordon Slemon Design Award
Orbis Prize
CNIB Hochhausen Prize
IEEE Student Paper Competition
Centennial Thesis Awards
Certificates of Recognition
Design Fair Showcase (by invitation only)

Check ‘Awards’ page on website

Time Conflicts for Oral Presentation or Design Fair

- Dates are chosen via Doodle
  - If your presentation conflicts with evening midterms:
    - If not completely overlapping, group usually presents after the test
    - Ask instructor of other course to move the test date or allow you to write your test earlier
    - Inform your administrator as soon as possible!

Beyond ECE496…

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The Last Word from Ted Herman

- The work I did in ECE496 got me a job
- We started badly, realized our problem.
The fix was:
  - Weekly “must attend” team meetings with subtask assignment and peer pressure to finish them
  - Business first; friends later
Sample Presentations

Acknowledgements:
- Matthew Cott (1T1)
- Mario Milicevic (1T0)
- Ted Herman (1T0)
- Jason Bullers (0T9)
- Gregor Simeonov (0T8)

Contents
- A complete example
- By section
  - How to start
  - The outline slide
  - Design Overview
  - Progress and Accomplishments
  - How to end

AC Outlet Monitor & Control
Project Overview

Paul Haist, Nahid Hassan, Ted Herman

Agenda
- Problems
  - Rising Electricity Demand
  - Consumer Perception of Electricity Use
- Motivation
  - Consumer Awareness
  - Social Psychology
- Our System: A Household Power Monitor and Control Network
- Project Status
  - Achievements
  - Delays
Rising Electricity Demand

- Demand expected to double over next thirty years
- The single fastest source of growth is residential demand

Consumer Perception: Energy Efficient Appliances

- Consumers do not perceive using energy, but rather, using appliances
  - Slow adoption of improved efficiency household appliances

Consumer Perception: Standby Power

- Many electrical devices draw miniscule amounts of power when the device has been switched off, known as “standby power”
- The average American home contains 40 such devices
- Standby power accounts for almost 10% of residential electricity use in the United States

Changing Consumption Habits

- Energy consumption indicators → 15% reduction
  - The power of awareness
- Comparison to neighbourhood average → 3% reduction
  - The power of social norms
Our goal

- To cut home energy usage by creating awareness of real-time power consumption within the home and offering some degree of control over the power consumption.

Requirements

1. Monitoring the power consumed by an appliance
2. Reporting power usage statistics
3. Control power to appliance
4. User Interface: Graphically display statistics and provide control functionality

High Level Design

Base Station System Design

- Web Based UI
- Household Power Monitor and Control Network
- Base Station hosting Web Server
- Node 1
- Node 2
- Node n
- MCU Wireless Module
- ZigBee™
- Home Server: Open-Rd Base Board (Plug Computer)
- Serial Interface
- Wireless Module
Node System Design

Achievements

Achievements: Wireless Link
- Communication from base to node
- Acknowledgements to avoid lost packets
- Basic high level protocol

Achievements: PMU
- Simulated design on LTSpice™
- Tested design on breadboard
- Written code to communicate with MCU
Achievements: Server

- Communication to PC over ethernet
- Installed Apache™ web server

Achievements: TRIAC

- Simulated design in LTSpice™
- Tested design on breadboard

Delays in the Schedule

- Successfully execute code on MCU
- Communication between Base Server and PC
- TRIAC circuit is more complex than originally planned

Changes caused by delays

- Time required to create a custom PCB
Looking Forward...

- Integrating the MCU and PMU over SPI
- Link Base to wireless module over UART
- Implementation of application layer on MCU
- More complex TRIAC driver

Thank You

Come see us at the Design Fair to see a working demonstration!

How to start ...

- The first 3 slides from two different presentations

AC Outlet Monitor & Control
Project Overview

Paul Haist, Nahid Hassan, Ted Herman
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Rising Electricity Demand

- Demand expected to double over next thirty years
- The single fastest source of growth is residential demand

![Bar chart showing residential and total demand growth from 2000 to 2030 (estimated)](chart.png)

Consumer Perception: Energy Efficient Appliances

- Consumers do not perceive using energy, but rather, using appliances
- Slow adoption of improved efficiency household appliances

![Comparison of household appliances from 1987 to 2007](appliance.png)

The Autonomous Robotic Systems Team

- Rohaan Ahmed
- Mohammad Hasanain Arshad
- Osman Saleem
- Matthew Cott

Intelligent Ground Vehicle Competition
This Presentation...

• Purpose:
  Provide an understanding of the IGVC competition.
  Provide an overview of the robotic vehicle design.
  Explain the important aspects of the design.

Also Prepared
- IGVC Competition
- The Robotic Vehicle
- Hardware and Sensors
- Computer Vision
- Collision Avoidance
- Navigation – Auto-Challenge
- Localization & Nav-Challenge
- Simulation
- Player/Stage
- Mechanical Systems
- Power Systems
- JAUS

Intelligent Ground Vehicle Competition

• Annual international inter-university robotics comp.
• Rochester, Michigan, USA – June 3-6, 2011

• Organizers & Major Sponsors include:
  - Association for Unmanned Vehicle Systems International (AUVSI)
  - United States Department of Defence (US-DOD)
  - United States Army Tank Automotive RD&E Center (TARDEC)

"The IGVC offers a design experience that is at the very cutting edge of engineering education. It is multidisciplinary, theory-based, hands-on, team implemented, outcome assessed, and based on product realization."

University of Detroit – Mercy (2008)
- Bluefield State College (2008)
- Worcester Polytechnic Institute (2010)
- University of Michigan (2010)
- University of Detroit – Mercy (2008)
- Bluefield State College (2008)
- Worcester Polytechnic Institute (2010)

The outline slide...

Two outlines...

Agenda

- Problems
  - Rising Electricity Demand
  - Consumer Perception of Electricity Use
- Motivation
  - Consumer Awareness
  - Social Psychology
- Our System: A Household Power Monitor and Control Network
- Project Status
  - Achievements
  - Delays

Outline

- Project Goal
- Project Requirements
- System-Level Design
- Progress
- Conclusion
Design Overview Slides...

The primary goal of the FPGA is to receive, decode, scale, and display live video frames.

High Level Design

Base Station System Design

Web Based UI

Base Station hosting Web Server

Household Power Monitor and Control Network

Node 1

Node 2

Node n

Appliance Power Control

Power Usage Data

Web Based UI

Router

Home Server: Open-Rd Base Board (Plug Computer)

Serial Interface

MCU Wireless Module

Wireless Module: ZigBee™
Node System Design

Progress and accomplishments...

Achievements: PMU

- Simulated design on LTSpice™
- Tested design on breadboard
- Written code to communicate with MCU
Achievements: Server

- Communication to PC over ethernet
- Installed Apache™ web server

Project status and how to end...

In summary, the project is currently on-track, with scheduled completion expected for March, 2010.
We look forward to seeing you at the Design Fair!

Changes caused by delays

<table>
<thead>
<tr>
<th>Time frame</th>
<th>Description</th>
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</thead>
<tbody>
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<td>Electrical Design Implementation Unit 1</td>
</tr>
<tr>
<td>2</td>
<td>Bill of Materials Integration</td>
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<tr>
<td>3</td>
<td>Test Plan for PC Board Integration</td>
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<tr>
<td>4</td>
<td>Test TRIAC circuit stability</td>
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<tr>
<td>5</td>
<td>Software Design Implementation</td>
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<tr>
<td>6</td>
<td>Bender Unit</td>
</tr>
<tr>
<td>7</td>
<td>Create Design for Power Frame</td>
</tr>
<tr>
<td>8</td>
<td>Review Design Issues on Board Layout</td>
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<tr>
<td>9</td>
<td>Commission of MMIC Devices</td>
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<tr>
<td>10</td>
<td>Create Design for Power Frame</td>
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<tr>
<td>11</td>
<td>Test multiple load testing</td>
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<tr>
<td>12</td>
<td>Commission of MMIC Devices</td>
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<tr>
<td>13</td>
<td>Verify and Design for Power Frame</td>
</tr>
<tr>
<td>14</td>
<td>System Integration (Tools - Server + US)</td>
</tr>
<tr>
<td>15</td>
<td>Bill of Materials Creation</td>
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Time required to create a custom PCB

Delays in the Schedule

- Successfully execute code on MCU
- Communication between Base Server and PC
- TRIAC circuit is more complex than originally planned

Looking Forward...

- Integrating the MCU and PMU over SPI
- Link Base to wireless module over UART
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- More complex TRIAC driver
The when and how of ethics reviews


You are working under the aegis of the University of Toronto

• U of T subscribes to high ethical standards
• The reputation of all associated with U of T is at stake
• All research at U of T involving humans and animals must undergo review by its Research Ethics Board
• Undergraduate research protocols are normally handled by a Delegated Ethics Review Committee (DERC)

When do I need an ethics review?

• All research that involves living human subjects requires review and approval by a Research Ethics Board (REB) before the research is started
• Research involving human remains, cadavers, tissues, biological fluids, embryos or fetuses shall also be reviewed by the REB

When...for animals?

• All procedures involving the use of vertebrates and higher form invertebrate animals
• Any animal research or teaching project administered by the university, which is to be conducted in the field or in a non-affiliated university facility
Definition of “minimal risk”
As it is defined in Canadian and US guidelines
Risk that is more-or-less on par with daily life
– the probability and magnitude of possible harms implied by participation in the research is no greater than those encountered by participants in their everyday life in similar situations

What is ethical (human subjects)?
• Minimal risk
  • Group vulnerability: any pre-existing vulnerabilities, e.g., relating to pre-existing physiological or health conditions
  • Research risk: the probability of harms to participants as a result of the proposed methods and types of data to be collected: e.g., relating to physiological or health issues, stress or anxiety during data collection

Other issues (human subjects)
• Methods and data
  – Procedures, setting, primary or secondary data, student’s relevant experience and supervision
• Recruitment
  – How and where, relationship with student
• Consent
  – Informed consent, consent form, consent from custodian, e.g. when children are participants
• Confidentiality
  – Storage of records, protection of personal data

Resources
• In the home page of U of T, type: undergraduate ethics review in search box
  – Access to protocol form and information
• U/G Faculty office contact and admin help:
  – Ms Estina Boddie, estina@ecf.utoronto.ca
• Informal assistance in this course:
  – Prof. Hans Kunov, h.kunov@utoronto.ca
  Note that Dr. Kunov is a Reviewer on the Faculty DERC. He cannot be directly involved in writing the protocol, nor can he review protocols from groups for which he is the Administrator
This is the top of the 7-page form that you download from U of T’s Research Office. It is in Word format. Please fill in on your computer.

Submission of protocol

- Have the protocol signed
  - Principal Investigator (team leader)
  - Faculty Supervisor
  - Undergraduate Coordinator
  - Department Chair
- Submit to Vice Dean u/g office (Ms. Estina Boddie)
  - Electronic copy (with all signatures scanned)
    - Submit as a single file only, please!
  - Hard copy as well, if you don’t have electronic signatures
    - Hard copy with signatures, electronic copy without

Animals in Research

The use of animals for research, teaching or testing at the University of Toronto is subject to
- Ontario’s Animals for Research Act, and
- The federal Canadian Council on Animal Care
- The fewest number of animals are used under conditions that ensure their proper care and welfare
U of T adheres strictly to the 3 Rs

- Reduction
  - Use fewer animals
- Replacement
  - Do without animals
- Refinement
  - Develop better methodologies


Humane principles

Investigators and teachers who consider it essential to use vertebrates or invertebrates in their research, teaching or testing in the laboratory or in the field, must adhere to humane principles, and take cognizance of CCAC’s* Ethics of Animal Investigation

*Canadian Council on Animal Care

CCAC* policy statement on ethics of animal investigation

- The use of animals in research, teaching, and testing is acceptable ONLY if it promises to contribute to understanding of fundamental biological principles, or to the development of knowledge that can reasonably be expected to benefit humans or animals
- Animals should be used only if the researcher’s best efforts to find an alternative have failed. Those using animals should employ the most humane methods on the smallest number of appropriate animals required to obtain valid information

*Canadian Council on Animal Care

Categories of invasiveness in animal experiments

A. Most invertebrates or on live isolates
  - The use of tissue culture, e.g., protozoa
B. Experiments which cause little or no discomfort or stress
  - Short-term and skilful restraint of animals; blood sampling; injection of material in amounts that will not cause adverse reactions
C. Experiments which cause minor stress or pain of short duration
  - Catheterization of blood vessels or body cavities, stressful restraint
D. Moderate to severe distress or discomfort
E. Severe pain near, at, or above the pain tolerance threshold of anaesthetized conscious animals

This is most likely the category in which your work will be classified

Unacceptable at U of T
Additional links

- Informed consent
- Data security
- Tri-Council Policy Statement

Quotes

- Relativity applies to physics, not ethics
  – Albert Einstein
- Ethics is nothing else than reverence for life
  – Albert Schweitzer