EE-399

LECTURE NOTES

Second Semester
1427-1428

EE 399, Lecture : Introduction and Guidelines

Instructor: ……. Room #: …… Phone #: ……..

Course Objectives:

The course main objective is to enhance and sharpen students' communication skills. This includes, but not limited to, the following skills:

- Thinking skills
- Searching skills
- Writing skills
- Presentation skills
- Teaming skills
- Evaluation skills

The course is designed to cover the above skills through, Lectures, Assignments, Activities, and the Final Paper.

Course Topics:

The specific topics that will be covered in this course are listed in the weekly plan sheet. There will be a lecture in each week and some activities related to the lecture. The new and the due assignments are specified in a weekly basis.

Course Policies:

The course policies are detailed in another sheet. They cover the following:

- General policies
- Choosing final paper topic policy
- Referencing policy
- Plagiarism policy
- Coordination policy
- Evaluation policy

Every student should read and understand these policies.

Grading:

5	Punctuality in attendance
10	Participation
35	Seven assignments
20	Two quizzes
15	Final report: written
15	Final report: oral presentation

A student final grade sheet is provided, which show how the final grade is calculated.

References:

Many good references are available off the shelf from the communication skills center room (2C 102) in the EE dept. All students are encouraged to benefit from them during this course.

Course Policies

1. **General Policies:**
   - Attending the class from the 1st minute is essential to benefit from the course. Therefore, five points dedicated for students who show up at least 10 lectures from the 1st minute.
   - If you are late more than 10 minutes, you will be considered absent.
   - According to the university policy, any student fails to attend 75% of the course hours will fail in the course, regardless of his grade!
   - English language is used throughout this course. Therefore, reports, presentation, and activities have to be in English.
   - All reports and assignments have to be written using MS Word using 1.5 spacing, New Times Roman font of size 12, and margins of 1 in.
   - All presentations have to be in Power Point.

2. **Choosing Final Paper topic Policy:**
   - Every student has to choose a topic according to the guidelines given in assignment no. 1.
   - No identical topic-specifics are allowed among all sections; therefore, it is the responsibility of each student to have an independent topic.
   - If two or more students choose similar topic-specifics, they will be asked to change theirs.
   - The topic should have clear importance to the country in general, and the student in particular.

3. **Referencing Policy:**
   - References, listed in all assignments or final paper, have to be used directly.
   - A hard copy of any reference used in any assignment should be submitted with any assignment

4. **Plagiarism Policy:**
   - Taking any information from other sources without referring to them is considered an act of plagiarism.
   - Even with including the reference, the student must use his own words. Copying word for word is not allowed.
   - Copying (completely or partially) from other students is considered an act of plagiarism.
   - Any act of plagiarism is prohibited in this course and may result in getting zero in the submitted work or failing in the course.
   - Every student has to sign a pledge which states clearly this policy.

5. **Coordination Policy:**
   - If a student in any section has a complain, or a request that needs a special treatment or arrangement; such as: being absent, missing a quiz for a legitimate excuse, objecting a decision made by his instructor, etc., then he has to describe his problem in English and su`mit a written request by e-mail to: ***ee399ksu@gmail.com***.
   - An official reply will be sent back to the student within a week from his submission with clear answer or direction.

6. **Evaluation Policy:**

- This policy designed mainly to ensure fair and consistent evaluation of students regardless of their sections. Although it assumes four instructors, it can be adapted to other situations.

- The 100 points are distributed as follows:
  - Seven Assignments (5x7): 35 points
  - Two Quizzes (10x2): 20 points
  - Punctuality: 5 points
  - In class activities (cards with two colors): 10 points
  - Final Paper Report: 15 points
  - Final Paper Presentation: 15 points

- The TA will be responsible for taking and recording the attendance of all students in all sections, and the 25% will be calculated based on his records.

- Each quiz will consist of 4 questions (one/instructor), and each instructor will grade his question. All questions carry the same weight and any revision should be directed to the owner of the question (not the section instructor).

- Assignments:1, 4, and 7 will be graded or evaluated by the section's instructor, however assignments: 2, 3, 5, and 6 will be graded for all students in all sections by ONLY one instructor per assignment (grader), as follows:

Assignment #	Grader
2	Instructor (1)
3	Instructor (2)
5	Instructor (3)
6	Instructor (4)

- If any student from any section wants to revise his grade, he should go directly to the grader within one week of the distribution. No re-evaluation should be made by another instructor.

- The final paper presentation and report are graded according to the following table:

All Sections Taught By	**Oral Pres. of F.P. (15 %)**	**F.P. Report (10 %)**	**Reviewer of F.P. Report (5 %)**
Instructor (1)	Instructor (4) Instructor (3)	Instructor (1)	Instructor (2)
Instructor (2)	Instructor (1) Instructor (4)	Instructor (2)	Instructor (3)
Instructor (3)	Instructor (2) Instructor (1)	Instructor (3)	Instructor (4)
Instructor (4)	Instructor (3) Instructor (2)	Instructor (4)	Instructor (1)

- The final paper report and the graded Assignments # 5, and 6 have to be submitted by each student before starting the final paper oral presentation exam. The two examiners will sign the report, and pass it to the section instructor for grading. No submission should be made directly to the instructor.

Weekly Plan for EE 399 (Semester II, 1428H)

wk	Topic (30 – 40 minutes)	Activity (70 – 80 minutes)	Assignment	Due
1	Registration			
2	Introduction and Guidelines (common lecture to all sections in 1B10)		**Pre-assignment a:** Bring to class at least three different ideas for your final paper topic	
3	Types of Documents and Report Structure	Brainstorming to choose the final paper topic + outline (pre-assignment a)	**Assignment # 1:** Topic title, outline, and introduction for the final paper	**Pre-assign a**
4	Searching, Compiling, Referencing, and Writing Ethics	Peer review of the extra copy of assign. #1	**Assignment # 2:** Literature review (Summarizing one English article and one English internet source using one paragraph for each)	**Assign. # 1** (two copies)
5	Guidelines for Good Writing: Punctuation and Grammar	Peer review of the extra copy of assign #2		**Assign.# 2** (two copies)
6	Guidelines for Good Presentations(I): Guidelines to prepare slides	Practicing converting topic outline to presentation slides	**Assignment # 3:** Integrating assigns 1 and 2 **Pre-assignment b:** prepare a two-minute present.	
7	Guidelines for Good Presentations (II): Delivering a successful speech	Practicing giving a presentation for the first time (pre-assignment b)	**Assignment # 4:** Presentation (I) Presenting assign 3 for two minutes	**Assign.# 3** **Pre-assign b**
8	**Oral Presentation of assignment 4**	Evaluation and discussion		**Assign.# 4**
9	Writing CV's and Letters	Practicing writing CV's	**Assignment # 5:** Writing a letter with a CV	**QUIZ # 1**
10	Introduction to Academic and Business Proposals	Practicing writing abstracts and conclusions	**Assignment # 6:** Writing Abstract and Conclusion for final paper integrated with assign. 3	**Assign.# 5**
11	Guidelines for Successful Interviews and Eng. Ethics	Practicing Interviews	**Assignment # 7:** Presentation (II) Presenting assign 6, without abstract, for three mn	**Assign.# 6**
12	**Oral Presentation of assignment 7**	Evaluation and discussion		**Assign.# 7**
13	Group Dynamics and management	Practicing meetings		**QUIZ # 2**
14	Electronic and multimedia workshop in the classroom library graded using the participation cards			
15	**Final Exam:** Four-minute Oral Presentation and submission of a formal Final Paper Report			

Course Assignments

Assignment		Objectives and Structure
Pre-Assign. # a	**Generating ideas for a topic**	Bring to your next class at least three different ideas for a final paper topic
Assign. # 1	**Introducing a topic** (one page max and submit two copies)	Within one page, write in correct English the following: o A very precise title using five to 10 words o An outline of your final paper with four to five sections o A two-paragraph introduction: one to identify the topic and the other to highlight its importance
Assign. # 2	**Lit. review** (submit two copies and attach articles)	Find and summarize one English article and one English internet source using one paragraph for each and using the proper referencing style and listing.
Assign. # 3	**Integrating assign. 1 and assign. 2**	Combine the first two assignments in one coherent document using the proper section titles
Pre-Assign. # b	**Practicing presentation**	Prepare a two-minute presentation about your topic using power point and bring it in a CD or flash memory (no disks)
Assign. # 4	**Oral Presentation I**	Prepare a formal two-minute presentation using the material of assign 3. Bring a CD or flash memory. Make sure you have a back-up.
Assign. # 5	**CV with a cover letter**	Write a short letter to an imaginary company to which you are submitting your CV for possible employment. Make sure your CV is attached.
Assign. # 6	**Writing an Abstract and a Conclusion**	Write a one-paragraph abstract and a one-paragraph conclusion about your topic and integrate them with assignment 3 as a one-document. Make sure to use the proper section titles, the proper order of sections, and do not forget proper referencing.
Assign. # 7	**Oral Presentation II**	Prepare a formal three-minute presentation using the material of assign 6, excluding the abstract. Bring a CD or flash memory. Make sure you have a back-up.
Class. Library assign.	**In-class workshop**	Use the available audio-visual tools and the electronic library available in the classroom. Pick a material of your choice. Take notes and show your instructor a summary of your activity.
Final paper		Submit a complete and very formal report of your topic. Make sure you label your sections properly and in the correct sequence of components. Pay attention to your referencing within the text and to the list of references. No grammar or spelling errors are tolerated.
Final present.		Prepare a formal four-minute presentation for your final paper. Bring a CD or flash memory. Make sure you have a back-up.

Assignments Grading Slips

Written Assignments

Criteria	Grade
Organization and formatting	**/1**
Writing Quality (spelling, grammar, etc.)	**/1**
Meeting all assignment requirements (in light of assignment objectives)	**/1**
Inclusion of copies of previously graded assignments' cover pages *	**/1**
Overall effort and improvement*	**/1**
TOTAL GRADE	**/5**

*** For assign. 2 and higher**

Grader's comments:

Strong points	Weak Points
▪	▪
▪	▪
▪	▪
▪	▪

Oral Assignments

Criteria	Grade
Slide Quality (design, bullets, spelling, etc)	**/2**
Skills (eye contact, voice, enthusiasm, movement, etc.)	**/3**
Presentation Content Quality (ideas, organization, knowledge, etc.)	**/3**
Timing	**/2**
TOTAL GRADE	**/10**

King Saud University
College of Engineering
EE Department

EE 399

COMMUNICATION AND PRESENTATION SKILLS

Assignment #: _____

Assignment Title: _____

Name of Student: _____

Student ID: _____

Section (Day/Time): _____

Instructors' Name: _____

Date of Submission: _____

Each Student should insert here the Grading Form suitable for this Assignment

INTERNATIONAL INFORMATION AND COMMUNICATION TECHNOLOGY STANDARDS

Student Name
ID No.: *nnnnnnnnnn*, EE 399: Professional Communications,
First *or* Second Semester, 14*xx*, 14*xx*

Abstract

This report addresses the international standards concerned with the "information and communication technology: ICT". The report identifies the subject, and emphasizes its importance for the widespread of the technology that supports development, through its promotion of information exchange and trade. The report reviews three main references on the subject. The first provides a general overview on the past development of ICT standards. The second emphasizes the current state of international standards in the various fields of "information technology: IT. The third addresses the current state of international standards associated with the different fields of the "communication technology: CT". The work recommends future investigations of the different international standards, associated with both IT and CT, for the purpose of integrating theses standards, as their fields have different degrees of inter-relationships. This would help having a single source of international standards for all ICT fields, and it would consequently avoid duplication of standards, and enhance interoperability among ICT systems and services.

1. Introduction

Standards concerned with the "Information and Communication Technology: ICT" provide specifications for the products of the technology, and give directions associated with the management of the use of these products. There are three international organizations concerned with producing ICT standards. These are: the "International Electro-technical Commission: IEC"; the "International Organization for Standardization: ISO"; and the

"International Telecommunication Union: ITU". IEC and ISO have a joint committee concerned with producing "Information Technology: IT" standards; the committee is known as the "Joint Technical Committee no. 1: JTC 1". ITU also has a body for producing "Communication Technology: CT" standards; and its known as "ITU-T, where T stands telecommunication".

International standards in ICT are of great importance, because of the benefits they give, both to the users of the technology, and to the producers of its products. The standards provide unified specifications for ICT products with a fine level of quality. They also give unified directions for their use, with a suitable level of reliability. This leads to a number of important benefits. One benefit is "interoperability" among ICT products. Another benefit is the "safe use" of the products from possible hazards. A third benefit is "avoiding the problem of production monopoly", where one producer controls the market with its own specifications. In addition, a fourth benefit is achieving "economy of scale" for producers where all products are of similar specifications; and this minimizes the cost of overheads. By enhancing ICT production and use, international standards support sustainable development in countries through promoting local, national and international exchanging of information and trade.

2. Literature Review

An important reference associated with ICT standards, and the organizations concerned with producing these standards is given in [1]. The reference covers the work of international organizations, and of national organizations concerned with providing ICT standards. The three international organizations: IEC, ISO, and ITU are taken into account. The ISO/IEC joint committee JTC 1 for IT standards, and the ITU standardization body ITU-T are addressed. In addition national organization, concerned with ICT standards, from North American countries, European countries, Asian and Pacific countries are also considered.

In addressing the ICT standards, and the national and international organizations concerned with the development of these standards, reference [1] considers different issues.

- It emphasizes the importance of developing ICT standards, the benefits of these standards, and the need for conformance with the international standards.
- It highlights the history of the organizations concerned with these standards, their structure, their standardization procedures, and their produced standards.
- It discusses the relationships between the various organizations, including: the relationships between the international organizations; and the relationships between the international organizations on the one hand, and the national organizations on the other.

The problem with reference [1] is that it is relatively old, and does not include the current state of the various addressed organizations. For the purpose of covering the current state of international ICT standards, two other references are used. One reference addresses the current state of ISO/IEC JTC 1 standards [2]; while the other considers the ITU-T standards [3]. These references are reviewed in the following.

In presenting the current state of JTC 1, reference [2] indicates that the joint technical committee has a number of "Sub-Committees: SCs", with each SC specialized in a specific IT field. The SCs can be viewed as divided two main groups: SCs concerned with providing "IT tools and system support"; and SCs associated with "media systems". Some of these SCs are currently inactive after accomplishing their tasks, while the others are currently active and producing or updating IT standards. Table 1 gives a list of these SCs [1, 2]. The total number of IT standards produced by these SCs has exceeded "1800" [2].

Reference [3] shows that like the case with JTC 1, the ITU-T has a number of "Study Groups: SGs", with each SG concerned with a specific telecommunication field. Table 2 lists these study groups, showing the specific field of each of these groups. The total number of CT standards produced by these SGs has exceeded "3000" [3]. From Table 2 and the Table 1, it can be seen that there are related fields between JTC 1 standards on the one hand, and ITU-T standards on the other.

Table 1: The technical subcommittees (SCs) of ISO/IEC JTC 1 [1, 2]
(*) Currently inactive

IT TOOLS AND SYSTEM SUPPORT		MEDIA SYSTEMS	
SC	**FIELD**	**SC**	**FIELD**
1	*Vocabulary (*)*	*11*	*Flexible magnetic media for digital data exchange(*)*
2	Coded character set		
6	Telecommunications and information exchange between systems	17	Cards and personal identification
		23	Digital storage media for information interchange
7	Software and system engineering	24	Computer graphics, image processing and environmental data representation
14	*Representation of data elements(*)*		
18	*Text and office systems(*)*	29	Coding of audio, picture, multimedia and hypermedia information
21	*Open system interconnection(*)*		
22	Programming languages, their environment and system interfaces	31	Automatic identification and data capture techniques
25	Interconnection of IT equipment	34	Document description and processing languages
26	*Microprocessor systems (*)*		
27	IT security techniques	36	IT for learning, education and training
28	Office equipment		
32	Data management and interchange	37	Biometrics
35	User interfaces		

Table 2: ITU-T study groups (SGs) for developing recommendations (standards) [3]

SG	FIELD	SG	FIELD
TSAG	Telecommunication Standardization Advisory Group	9	Integrated broadband cable networks and television and sound transmission
2	Operational aspects of service provision, networks and performance	11	Signaling requirements and protocols
		12	Performance and quality of service
3	Tariff and accounting principles including related telecommunication economic and policy issues	13	NGN: Next Generation Networks
		15	Optical and other transport network infrastructures
4	Telecommunication management	16	Multimedia terminals, systems and applications
5	Protection against electromagnetic environment effects	17	Security, languages and telecommunication software
6	Outside plant and related indoor installations	19	Mobile telecommunication networks

The work of the three references described above contributes to the understanding of the international standards concerned with ICT. Table 3 provides a comparison between theses references. The comparison considers: the contributions of the references to the subject, that is their strengths; the needed issues that have not covered by the references, that is their weaknesses; and the opportunities they open for future work that addresses these issues. This is discussed in the following section.

Table 3:Evaluations of the contributions of the reviewed references

Reference	**Main contributions:** ***Strengths***	**Important uncovered issues:** ***Weaknesses***	**Opportunity:** ***Future work***
1	An overview of ICT standards both at the national level and at the international level	Relatively old: Absence of the current state of international ICT standards	Investigation of progress from the older state of ICT standards to the current state
2	An overview of the current state of ISO/ IEC JTC 1 standards	No link to other related standards of the ITU-T	Integrating the ISO/IEC JTC 1 standards with ITU-T standards considering their inter-related fields.
3	An overview of the current state of ITU-T standards	No link to other related standards of the ISO/IEC JTC 1	

3. Future Work

The work of the first reference [1] is relatively old and lacks the presence of the current state of ICT international standards provided by the international organizations: IEC, ISO, and ITU. This problem is addressed by references [2] and [3], where reference [2] is concerned with the current state of ISO/IEC JTC 1 IT standards, and where reference [3] is associated with the current state of ITU-T CT standards. The two references [2] and [3] have similar problems associated with the lack of integration of ICT standards. Reference [2] addresses IT standards, and reference [3] addresses CT standards, while these standards should be addressed under one umbrella due to their inter-relationships. Here comes the need for the future work suggested in the following.

It is recommended that related JTC 1 and ITU-T standards should be reviewed for integration; the should be re-issued jointly to avoid any possible misinterpretation or conflict between what each one of them recommends. Tow examples of such work are given below.

- JTC 1 has a number of subcommittees concerned with various multimedia issues, as shown in Table 1. ITU-T also has one of its study groups associated with multimedia terminals, systems and application, as given in Table 2. International standards on multimedia should be revised, integrated, approved by JTC 1 and ITU-T, and re-issued by one joint study group.

- JTC 1 has a subcommittee concerned with IT security techniques, as shown in Table 1. ITU-T also has one of its study groups associated with security, as given in Table 2. The standards given by these groups should be revised, integrated, approved by JTC 1 and ITU-T, and re-issued by one joint study group, like what is suggested above for multimedia.

4. Conclusions

The literature review, of ICT international standards, given in this report demonstrates that there is a large number of such standards: over “1800” IT standards, associated with “23” IT fields, recommended by JTC 1; and over “3000” CT standards, related to “13” CT fields, recommended by ITU-T. The review also shows that, despite their inter-relationships, these standards come from two international sources, and not from a single one. For this reason, the report emphasizes the need for future work toward integrating the inter-related standards coming from the different sources. This would avoid duplication of international standards concerned with similar issues, and would consequently enhance interoperability among ICT systems and services.

5. References

1. A. Macpherson, International Telecommunication Standards Organization, Artech House, Boston, London, 1990.
2. M. De Soete, "ISO/IEC JTC 1 SC 27 perspective", ITU-T Workshop on New Horizons for Security Standardization, ITU Headquarter, Geneva, October 3-4, 2005. (Available free, in PDF format, on ISO Website: www.iso.org, January 2006).
3. The website of the International Telecommunication Union: www.itu.org, January 2006.

SAMPLE REPORT

Grand Valley State University
Padnos School of Engineering
EGR 345: Dynamic Systems Modeling and Control

Lab #4

Deadband Compensation for Bi-directional Motion

Jonathon E. Dyer
October 24, 2003

Abstract

Bi-directional motors will not turn when very small voltages are applied due to a friction force in the motor. This force can be compensated for using software. Without deadband compensating software, the motors used had no rotation at voltages between –1.5V and +1.1V. With deadband compensating software, the motor rotated at any desired voltage. This lab uses C programming to compensate for "stiction" in a bi-directional motor.

Background

"Stiction" is a word that describes the static friction force that causes electric motors to remain motionless when small voltages are applied. This "stiction" only applies before the motor breaks free and begins to move. After this point, the kinetic friction is a constant torque. There must be enough of a voltage drop across the motor to overcome this initial static friction force. The range of voltages that do not overcome the "stiction" force is called the deadband. This range of voltages can be experimentally approximated, and software can be used to compensate for this range. This software will assure that voltage levels do not drop into the deadband range. Any values desired within that range will be compensated for to prevent the motor from sticking. With ideal software, the applied voltage would never be in the deadband range.

Equipment/Software

Equipment:

- Computer with Internet Access
- Axiom M68HC11 board
- 1 DC Motor Nissei Denki Model #9J13
- 1 Digital Multimeter
- 1 Strobe Tachometer
- 1 L293D Push-pull four channel driver chip
- External Power Supply

Software:

- EVBU
- Gcc6811 Compiler

Background / Theory

Deadband limits can be found by applying known voltage to a motor that starts motionless, and increasing the voltage until the motor breaks free. The voltage at which the motor breaks free is the deadband limit. There will be two limits for a bi-directional motor, one in each direction, corresponding to two voltages. These numbers may be different due to the design of the brushes in the motor. Positive and negative deadband limits are shown in Figure 1 below:

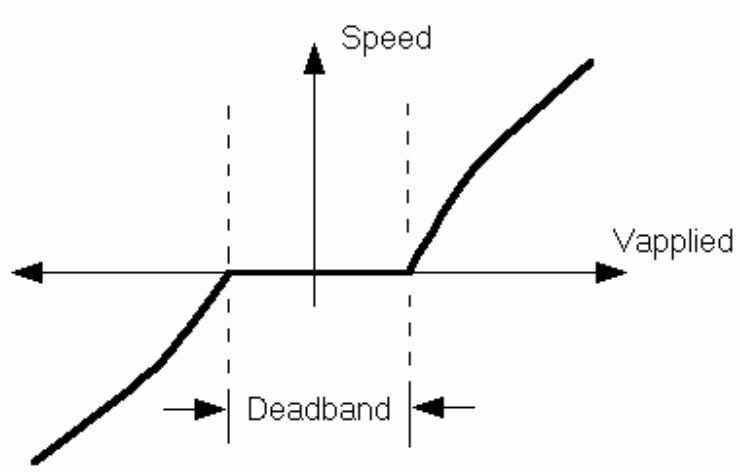


Figure 1: Deadband Voltages

Software can be used to compensate for this deadband. The software should adjust the voltage wanted by the user to voltage outside of the deadband. This would allow the motor to spin at any speed the user desires. It should also slightly adjust voltages near the deadband limits to compensate for the kinetic friction forces that cause the slight change in slope of the speed near the deadband region. Visually, this adjustment is shown in Figure 2 below.

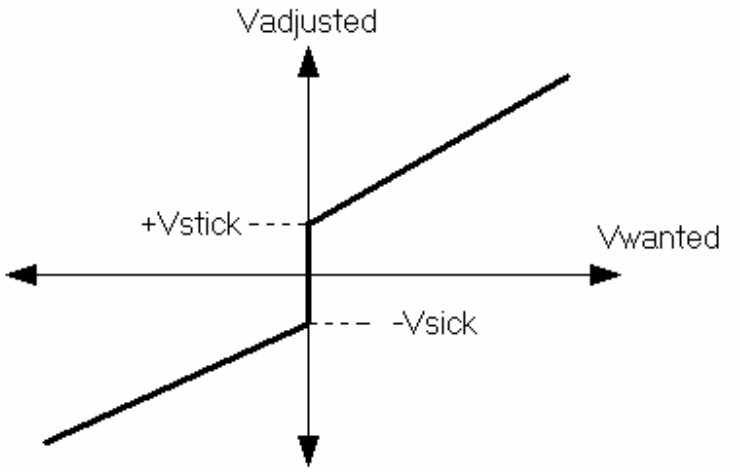


Figure 2: Software Compensated Voltages

This concept can be applied to the pulse-width modulated output of a 68HC11 micro-controller. The pulse-width modulation output range of the 68HC11 is from –255 to +255. These numbers correspond to a voltage of –5V and +5V respectively. Keeping these ranges in mind, equations are developed for adjusting the voltage the user desires to a voltage that will cause the motor to spin. If the user desires a voltage above 255, the software should adjust it to 255. Also, if the user desires a voltage in the deadband, the voltage applied should be slightly outside of the deadband.

First, if the desired voltage is zero, the applied voltage must be zero. The next equations needed are code that adjusts a positive desired voltage to a voltage outside of the deadband region, and a

desired negative voltage to a voltage outside of the deadband region. This is implemented with syntax shown in Figure 4.

```
If(c_wanted = = 0){
        c_adjusted = 0; }
If(c_wanted >0){
        c_adjusted = c_stick_pos + c_wanted * (c_max – c_stick_pos) / c_max; }
If(c_wanted <0){
        c_adjusted = -c_stick_neg – c_wanted * (c_min – c_stick_neg) / c_min; }
```

Figure 4: Adjusting Positive and Negative Voltage

The code shown in Figure 4 adjusts the voltage outside of the range, but does not take into account the fact that the adjusted voltage may become larger than the pulse width modulation of the 68HC11 is capable of. Further code must be used to "clip" voltages into the range useable. This syntax should check the adjusted voltage, and if it is above 255 or below –255, set it to these maximum and minimum useable values. The syntax used for clipping is shown as the void v_output (c_adjusted) subroutine in the final program used. This is shown in Appendix A.

After the desired voltage values have been adjusted and clipped, the resulting voltage graph should look like the graph shown in Figure 5.

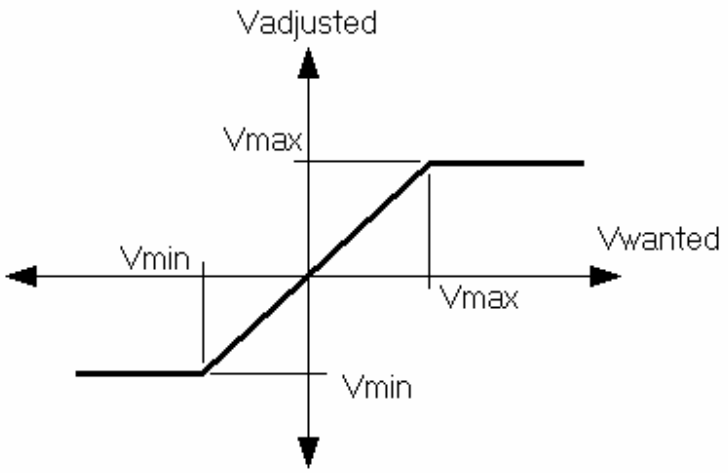


Figure 5: Adjusting and Limiting Output Voltage

Circuitry and Components

A simple transistor can be used to drive a motor in one direction. An H-bridge is a circuit of 4 transistors that allows the motor to be driven both clockwise and counterclockwise. Transistors are still used to switch current flow. A diagram showing the H-bridge circuitry is shown in Figure 6.

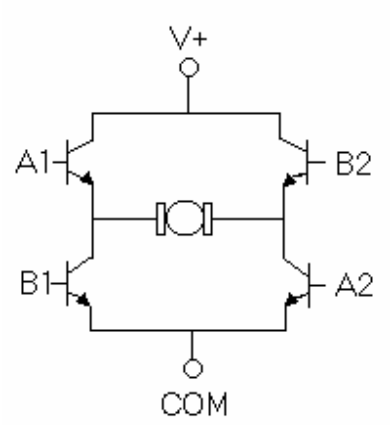


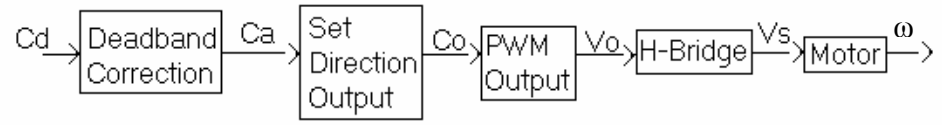
Figure 6: H-bridge Circuit for Motor Control

The H-bridge circuitry works by applying voltages to pairs of transistors. Applying voltages to A1 and A2 would allow the voltage to travel from left to right through the motor. Applying voltages to B1 and B2 would allow the voltage to travel from right to left across the motor. These would correspond to clockwise and counter-clockwise rotation.

This circuitry could easily be damaged if A1 and B1 or B2 and A2 were turned on. It would act as a short circuit in the chip, and eventually, the chip would be damaged. To prevent this, protective circuitry is used. This protective circuitry is built into the H-bridge chip, and ensures that either the clockwise or counter-clockwise direction is enabled, but not both.

Software for Deadband Compensation

Software is used to implement the plan for deadband compensation discussed thus far. It should implement the theory behind deadband compensation, clip the values to keep them within the useable range of the 68HC11, and interface between the 68HC11 and a bi-directional DC motor. A block diagram that shows the process desired is shown in Figure 7 below.



Where:
Cd = desired speed of the motor (-255 → 255)
Ca = adjusted speed of the motor (-255 → 255)
Co = PWM output (0 → 255)
Vo = Effective PWM output voltage (0V → 5V)
Vs = Effective motor supply voltage (0V → Supply V)
ω = the motor speed

Figure 7: Block Diagram for Deadband Compensation Software

From this block diagram, a C program can be developed. The program is shown in Appendix A.

Connecting Software to Hardware

The program in Appendix A is used to control the circuitry shown in Figure 8 below.

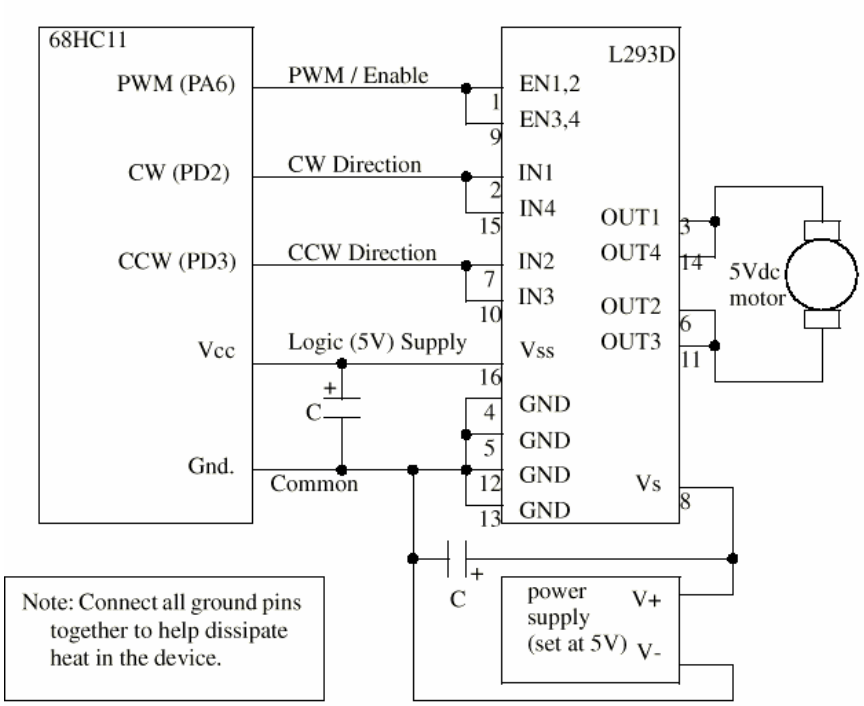


Figure 8: Circuitry Used to Drive the Motor

The circuit connects the 68HC11 micro-controller to a DC bi-directional motor through a L293D chip. The L293D chip contains the H-bridge circuitry shown in Figure 6 as well as protective circuitry described earlier. The power supply is set at 5V. The capacitor is bridged over the power supplied to the motor to regulate fluctuations in power supply. The circuit was built in small sections and tested to ensure components were functioning correctly. This process showed that the motor initially used was malfunctioning.

Determining Deadband Limits

To determine the deadband limits of the motor, the program shown in Appendix A was modified to set the deadband limits (c_stick_pos and c_stick_neg) to zero. This causes the program to have no adjustment for deadband compensation. By disabling the deadband compensation, the limits of the motor can be measured. The program was run, and the angular speed at various applied voltages was measured with the strobe tachometer. The motor was started from rest, and the applied voltage was incremented until the motor broke free and began spinning. Values were taken for both positive and negative desired voltages. The resulting outputs are shown in Table 1.

Table 1: Determining Deadband Limits

c_wanted	Vs (volts)	Motor Speed (RPM)

-251	-3.6	-7205
-218	-3.0	-6140
-170	-2.8	-5202
-130	-1.8	-3811
-120	-1.5	0
0	0	0
124	1.1	0
165	2.4	5101
201	2.8	6010
240	3.4	7039
251	3.5	7422

Note that at c_wanted = -120 and +124, the speed of the motor is zero. This data is also shown as a graph in Figure 9 below.

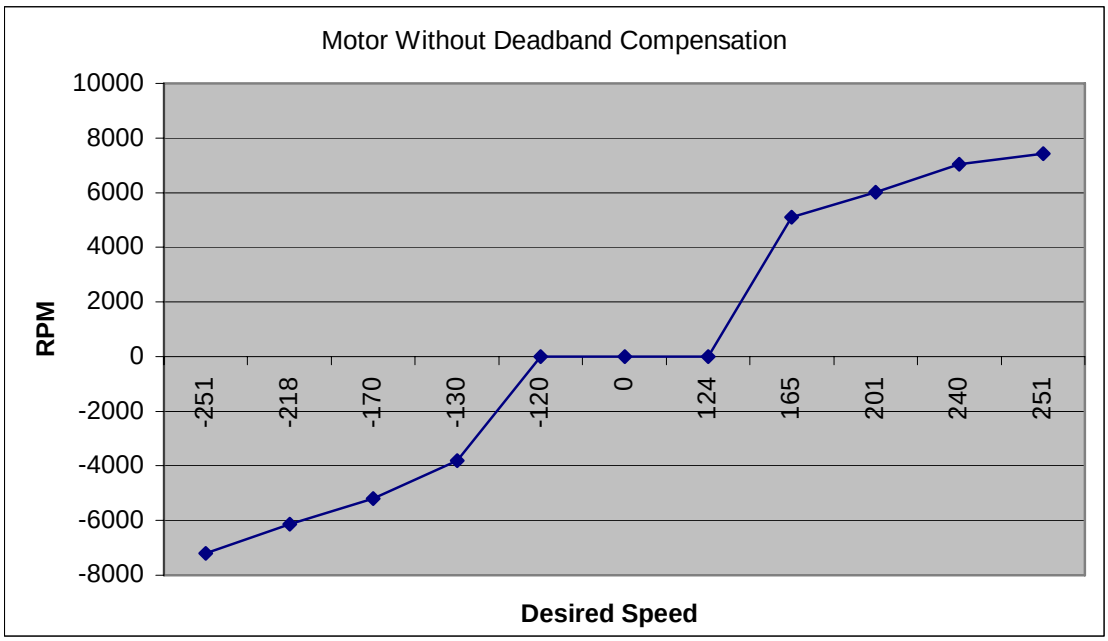


Figure 9: Graphing Deadband Limits

This graph has the same trend in applied voltages and motor speed as Figure 1. From this graph and the data in Table 1, the deadbands of this motor are found to be –120 and +124. These deadband limits can be used in the C program. The C program was modified such that c_stick_pos was defined as 124, and c_stick_neg was defined as 120. Table 2 contains data recorded after compensating for the deadband.

Table 2: Motor Speed with Deadband Compensation

c_wanted	Vs (volts)	Motor Speed (RPM)

-251	-3.6	-7211
-218	-3.0	-6201
-170	-2.9	-5922
-130	-2.7	-5486
-90	-2.4	-4957
-20	-1.7	-3418
-1	-1.5	-3048
0	0	0
1	1.7	3489
10	1.8	3731
20	1.9	3944
90	2.4	5203
124	2.7	5679
165	2.9	6014
201	3.1	6413
251	3.6	7498

This data is also shown in Figure 10 below.

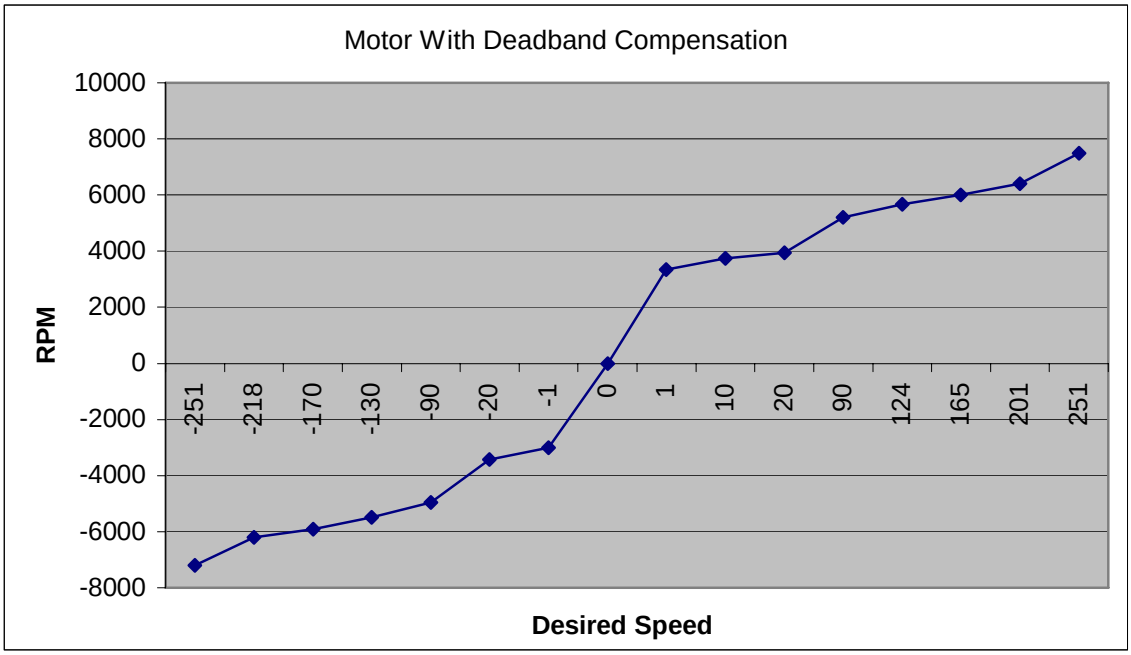


Figure 10: Motor Speed with Deadband Compensation

Figure 10 shows that the motor speed is only zero when the user wants it to be. The software adjusts voltage in the deadband region to set a voltage that will always turn the motor. The results of these two sets of graphs can be combined to graphically show the difference between a motor with and without deadband compensation. This comparison is shown in Figure 11.

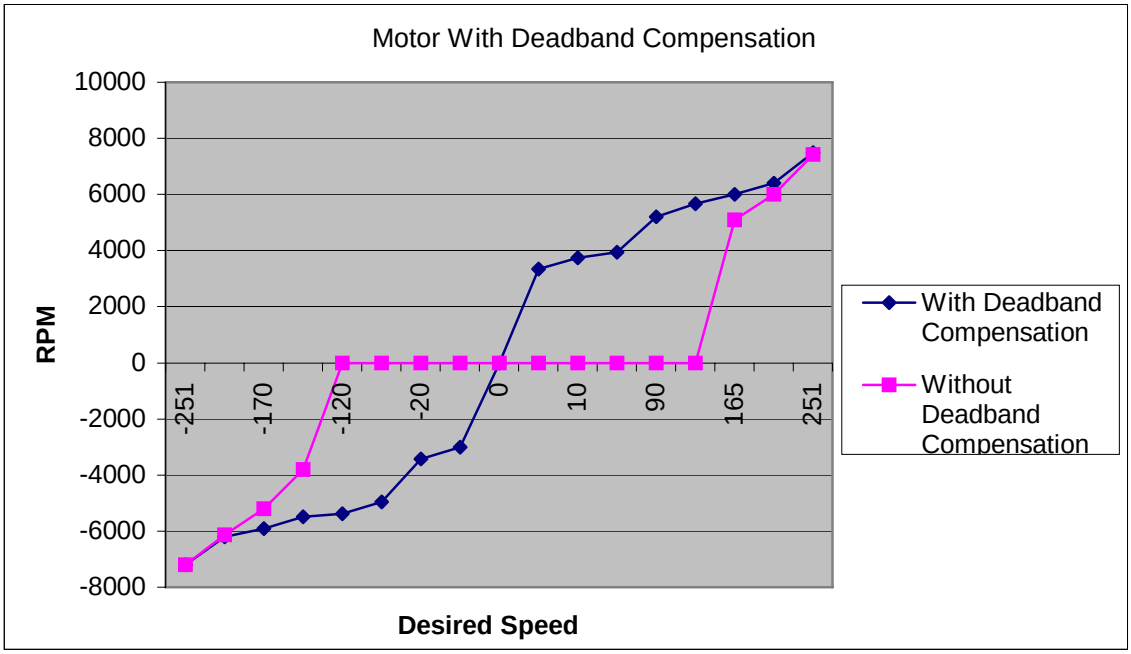


Figure 11: The Effects of Deadband Compensation

Discussion

This comparison shows the effects of deadband compensation. Without software for deadband compensation, the motor is unable to turn at low voltages. This creates a range of voltages at which the motor is unusable. With the deadband compensation, the motor speed is not zero unless the user wants it to be. This concept allows the use of less expensive motors in applications. The less expensive motors typically have a larger deadband. By using software to compensate for the deadband, money is saved.

The deadband region found in this experiment is the result of static friction in the motor. Setting the applied voltage to the maximum, and decreasing until the motor no longer rotates could find another deadband. This is a deadband that is the result of kinetic friction. It is smaller than the deadband caused by static friction. Assuming these voltages were the deadband of the motor would be ineffective. They would work well if the motor was spinning, but would fail to start the motor from rest at small desired voltages.

The maximum applied voltage to the motor was measured to be 3.6 volts. The maximum voltage supplied by the power source was 5 volts. This loss of voltage can be attributed to voltage drops across the L293D driver chip, as well as the other circuitry. The natural resistance of the components caused a drop in voltage between the supply and the motor.

Conclusions

1. Using software can compensate for deadbands in bi-directional motors.

2. The C program developed successfully compensates for the deadband of the bi-directional motor. Deadband limits were found to be +124 and -120. This equates to -1.5V and +1.1V.

3. The natural resistance of the components of the circuitry used to drive the motor causes a drop in the applied voltage, and maximum possible voltage.

4. Software deadband compensation saves money in designs by allowing the use of inferior (less expensive) motors.

References

1. Jack, H., "Deadband Compensation for Bidirectional Motion", October 24, 2003. http://claymore.engineer.gvsu.edu/~jackh/eod/courses/egr345/media/lab4_deadband.pdf

Appendix A: C Program for Deadband Compensation

```
//Jon Dyer – Deadband Compensation
//EGR-345  9-16-03

#include <hc11e9.h>
#include <buffalo.h>
#include "pwm.h"

int c_adjusted;                 //voltage adjusted for deadband
int c_wanted;                   //desired voltage from user
//#define c_stick_pos           0       //used to find deadband limits
//#define c_stick_neg           0       //used to find deadband limits
#define c_stick_pos                     124     //positive sticking voltage
#define c_stick_neg             120     //negative sticking voltage
#difine c_max                   255     //maximum possible voltage
#define c_min                   255     //minimum possible voltage
int c_adjusted = 0;             //voltage adjusted for deadband
int c_wanted = 0;               //desired voltage from user

int deadband(int c_wanted)      //deadband compensation subroutine
{
        if(c_wanted == 0)       //turn off output
        {
                c_adjusted = 0;
        }

        else if(c_wanted > 0)           //positive compensation
        {
                c_adjusted = c_stick_pos + c_wanted * (c_max - c_stick_pos) / c_max;
        }

        else if(c_wanted < 0)           //negative compensation
        {
                c_adjusted = c_stick_neg - c_wanted * (c_min - c_stick_neg) / c_min;
        }
        return c_adjusted;
}
void v_output(int c_adjusted)           //call from interrupt loop, clips voltages, changes direction
{
        if(c_adjusted >=0)
        {
                PORTD = 0x04;                   //set the direction to CW
                if(c_adjusted > 255)
                {
                        RefSignal = 255;    //clip output over max
                }
                else
                {
                        RefSignal = c_adjusted;
                }
        }
        else if(c_adjusted <=0)
        {
                PORTD = 0x08;                   //set the direction to CCW
                if(c_adjusted < -255)
                {
                        RefSignal = 255;    //clip output below min
                }
                else
                {
                        Refsignal = -c_adjusted;
                }
        }
```

Lecture 1

Introduction and Guidelines

1

Instructors

- ✓ Professor A. A. Ali
- ✓ Professor S. H. Bakry
- ✓ Professor M. A. El-Kady
- ✓ Dr. A. Abdennour

2

Lecture 1 Notes

- ☻ Course Description
- ☻ Course Policies
- ☻ Course Assignments
- ☻ Recommendations
- ☻ Q & A

3

Course Objectives

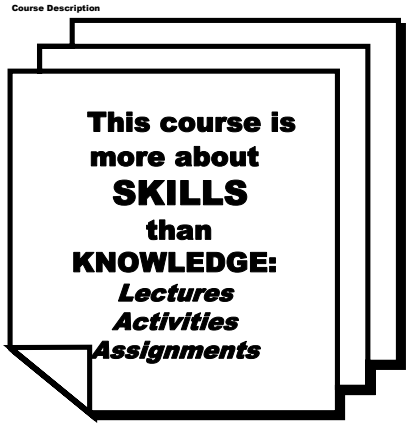
To gain the following skills:

- ☻ Thinking skills
- ☻ Searching skills
- ☻ Writing skills
- ☻ Presentation skills
- ☻ Teaming skills
- ☻ Evaluation skills

Skill
=
talent
=
ability
=
expertise
=
to become
very good

4

Course Description



5

Course Description

Course Lectures

1. Introduction (Today)
2. Searching and Writing Ethics
3. Documents, and Report
4. Guidelines for Writing
5. Guidelines for Presentation (I)
6. Guidelines for Presentation (II)
7. Proposals
8. Teaming and Management Skills
9. CV's and Letters
10. Interviews and Engineering Ethics

6

Course Policies

Course STRICT Policies

- ☻ "Transparency and uniformity"
- ☻ "Attending" the first minute is a MUST
- ☻ Only "English" language is used
- ☻ "Writing" guidelines are mandatory
- ☻ "Presenting" guidelines are mandatory
- ☻ "Course folder" is mandatory
- ☻ "Participation" is rewarded
- ☻ "Peer reviews / evaluations"
- ☻ "Plagiarism" policy: Zero, or F
- ☻ No section swapping!
- ☻ No late assignments!
- ☻ No late presentations!

7

Course Policies

Assignments & Quizzes

- ☺ Seven assignments (35 points)
  - ☻ Know the due date
  - ☻ Stick to the due date
  - ☻ Follow guidelines
  - ☻ Avoid all types of copying
  - ☻ Use cover sheet
  - ☻ Place the grading table
- ☺ Two quizzes (20 points)

8

Course Policies

Course Grading

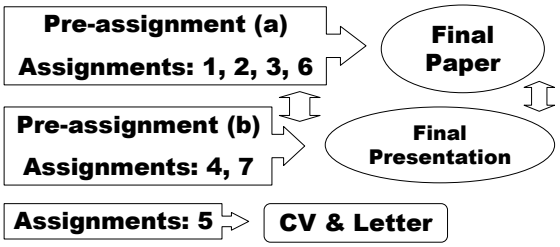
5	Punctuality in attendance
10	Participation (cards)
35	Seven assignments (7 x 5 points)
20	Two quizzes (2 x 10 points)
15	Final paper report: written
15	Final paper report: presentation

100	Points Total

9

Course Assignments

Assignments, Final Paper & Final Presentation



10

Course Assignments

Assignments: *Report*

Assignments		
(a)	**Ideas for a topic:** *Three possible titles*	*Required next week*
1	**Introducing a topic:** *chosen from (a)*	Title, Outline, Introduction
2	**Literature review:** *Article & Internet source*	Review with referencing
3	Integrating (1) & (2)	
6	Start - Finish	Abstract Conclusions

11

Course Assignments

Final Report

Final Paper	Assignments
Title: Cover page	Ass. 1
Abstract	Ass. 6
Introduction	Ass. 1 / 3
Literature Review	Ass. 2 / 3
Conclusions	Ass. 6
References	Ass. 2 / 3

Appendix	Letter & CV	Ass. 5

12

Assignments:
Final Presentation

Assignments		
(b)	Training for 1st presentation	
4	Presentation I	Assignments: 1, 2 / (3)
7	Presentation II	Assignment 6

Final Presentation	Presentation I & II

General Points !

- EE 399 is an important and useful course (your will find out at the end!)
- Never think of it as a 1-credit hour course! It is much much more!
- Start working on assignments from 1st day, if not you will be late!
- Use English-English dictionary
- Do not be shy! participate and learn
- Listen to English programs and read English newspapers

Avoid Saying:

- "My ENGLISH is poor" (this is not an English course)
- "I can not speak in public" (most of us have that fear)
- "Other students may laugh at me" (all of you are in the same level)
- "This course is a one hour course" (but you can get an F and keep taking it)
- "Passing EE399 with any grade is FINE" (well, try it!)
- "EE 399 covers all needed Skills" (not even close)

The END!

Let's hear your questions! / comments

Electrical Engineering Dept
King Saud University

LECTURE 2

REPORT STRUCTURE AND COMPONENTS

What is a good report?

- Meets the audience's needs
- Well organised
- Readable
- Answers the questions:
  - What is the purpose of the document?
  - What is to be achieved?

Document layout

- Beginning
  - Title
  - Abstract
  - Introduction
- Middle
  - Sections and sub-topics, figures, tables, etc.
- End
  - Conclusion &/or summary
  - References
  - Appendices

Format Example

- 1.0 Introduction
- 2.0 Methods and Apparatus
  - 2.1 Description of Models Tested
  - 2.2 Apparatus
  - 2.3 Calculations
- 3.0 Results
- 4.0 Discussion and Conclusions

Abstracts

- **The abstract is the second level at which a potential reader can filter out reports that he is or is not interested in reading.**
- **The abstract is generally limited to 250 words (or so). It must be a self-contained description of the report.**
- **It includes a short summary of the study and the most important results and conclusions of the paper.**

6

Titles

- **The title is more important than most people think.**
- **Your task in choosing a title is to use as few words as possible (less than 10) to clearly describe the content of the report.**
- **It is also a good idea to read through your title and think about how it might be interpreted.**

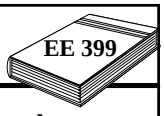
5

Methods

- **The methods section is used to discuss the specific approach (methods) used.**
- **Discussion of an experimental apparatus is often included in this section**
- **If the apparatus is sufficiently complex, a separate section is devoted to the apparatus.**
- **You might have section headings such as "Experimental Methods" and "Computational Methods".**

8

Introduction/Background



- **Provide your reader with background information on the topic of your paper.**
- **This section helps to get the reader "up to speed" if necessary.**
- **If your study builds upon work of others or requires the use of accepted formulae, this information should be provided in the introductory section of your paper.**

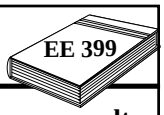
7

Discussion and Conclusions

- You must present your results with providing any insights useful to the reader
- You must interpret the results. How do the results compare with expectations (past research, literature, common sense...)?
- Are there any limitations in your apparatus?
- What are the implications of your findings?

10

Results



- Take time to investigate trends in your results and to look at many ways of presenting them
- Limit presenting the results in the "Results" section, and reserve comments and insights for the Discussion section.
- If you have few data to present then you may combine the Results, Discussion, and Conclusions sections.
- Likewise, if you have a great deal of data, you may choose to create subheadings.

9

References

- Use a unified system
- Always cite sources
  - Be careful of web sources
- Plagiarism = cheating
  - DO NOT cut-and-paste
  - Give references

12

Figure Captions

- ALWAYS include a figure caption and number
- Simple explanation of what the figure (or table) shows
- If the figure (or table) is not yours, put the reference number at the end of the caption
- Give the source of data (e.g., data from [5])

11

EE 399
Lecture 3

Searching, Compiling, Referencing and Writing Ethics

1

Objectives

- Familiarize with key principles and methods of literature search
- Gain competence in proper referencing of technical material
- Learn adherence to the norms of ethics and avoiding plagiarism

2

Use of Literature Search

- Technical study report
- Project proposal
- Thesis proposal
- Others

3

Sources Used in Literature Search

- Libraries such as the University main library
- National institutions (KACST, etc.)
- Internet
- Supervisor, teacher and colleagues

4

Types of Publications

- Journal papers
- Conference publications
- Internet sites
- Newspaper articles
- Books
- Other

5

Procedure for Literature Search

1. Identify topic of interest and define domain of search

2. Identify a coherent set of keywords
   - Concise and exhaustive
   - Structured in the form of 'AND/OR' clauses

   Example:

   Topic: "Use of expert systems in the design and operation of power networks"

   Keywords: POWER & (NETWORK OR SYSTEM) & (DESIGN OR OPERATION) & (EXPERT SYSTEM OR ARTIFICIAL INTELLIGENCE)

6

Procedure for Literature Search (continued)

3. Search your sources for relevant publications - Identify search time-span

4. Two-Stage Literature Search
   - ❶ Brief information (authors, titles and summary)
   - ❷ Full publication manuscripts

7

Procedure for Literature Search (continued)

5. Compile and sort the collected material
   - By date (chronologically)
   - Article nature (theoretical, bibliographical, applications, etc.)
6. Extract a list of references
   - Author(s)
   - Publication title
   - Name of journal (conference or publisher)
   - Volume number (or chapter)
   - Year of publication
   - Page numbers
     - ☛ Include this list of references in your final document
     - ☛ Refer to references whenever contents are used

8

Procedure for Literature Search (continued)

Examples (reference style):

[17] C. Rong-Liang, K. Allen and R. Billinton, "Value-based distribution reliability assessment and planning", IEEE Transactions on Power Delivery, Vol. 10, No.1, Jan. 1995, pp. 421-429.

[18] R. Billinton and J. Satish, "Reliability cost/reliability worth assessment of station configurations", Proceedings of IEEE Conference on Communications, Power and Computing, Vol. 1, May 15-16, 1995, pp. 175-180.

[19] R.A. Slavickas, R.T.H. Alden and M.A. El-Kady, Chapter 11, Power System Unbundling, McGraw Hill Book Co., New York, 1997.

[20] http://www.xxx.com

9

Procedure for Literature Search (continued)

7. Write your literature survey section(s)
   - ➔ Always acknowledge the source of information
     Example:
     "... as noted by the authors of reference [17]"
   - ➔ Do NOT copy whole sections of a reference
   - ➔ If necessary, include original text "between quotes" exactly as in the original source
   - ➔ Cite original source as part of figure caption (or table title) and obtain permission if necessary

8. Adhere to ethical norms and avoid plagiarism when compiling a literature survey (this issue will be looked at very seriously in the course!)

10

The END

11

EE 399
Lecture 4
Guidelines To Good Writing

Contents

Basic Steps Toward Good Writing

- For good writing, you have to understand:

  subject – purpose – audience
- Main steps:
  - Planning: ends up with sound outlines
  - Drafting: ends up with 1st draft
  - Revising: checks ideas and sentences
  - Proofreading: checks for grammar, spelling, and punctuation errors

Sound Outlines

Logical flow of ideas with multi-level structural divisions, as shown below

- First style:

I.
  A.
  B.
    1.
    2.
      a.
      b.
II.

- Second style:

1.0
  1.1
  1.2
    1.2.1
    1.2.2
      1.2.2.1
      1.2.2.2
2.0

The Paragraph

- It is a collection of related sentences dealing with a single topic
- Good paragraph has the following:
  - Reasonable length (at least 3 sentences)
  - Short (or medium) sentences (avoid long ones!)
  - Topic sentence: introducing the main idea of the sentence.
  - Unity: single focus
  - Coherence: e.g. use transition words.
  - Adequate development: the target idea should be made understandable to the target reader

(next slide)

Key Development Factors

- Use examples and illustrations
- Cite data: Give references (facts, statistics, evidence, …)
- Define terms
- Compare and contrast
- Examine effects and consequences
- Offer chronology (sequence) of an event

Transitional Words "Devices": 1 / 2

- Used to connect sentences in a paragraph, or two paragraphs together
- Examples:
  - **Causality**: accordingly, consequently, therefore, …
  - **Intention**: in order to do, for this purpose
  - **Location**: beyond, here, nearby, there, opposite
  - **Concession**: at any rate, at least,…
  - **Emphasis**: above all, clearly, in fact, of course,…
  - **Closure**: in conclusion, in sum, to summarize, …

Transitional Words "Devices": 2 / 2

- **Similarity**: likewise, similarly,…
- **Time**: afterward, at the same time, before, …
- **Amplification**: again, also, in addition, moreover
- **Detail**: especially, in particular, namely, …
- **Contrast**: however, in contrast, nevertheless, …
- **Interpretation**: fortunately, surprisingly, …

Textual Referencing to Numbers: 1/2

- Numerals used for measured quantities:
  - 1.3 centimeters
  - US $ 25,000
- Numbers of ten or less are written as words:
  - Nine cars, NOT 9 cars.
- If sentence begins with number, it should be in words:
  - Two NOT 2 students came late

Textual Referencing to Numbers: 2/2

- For consecutive numerical expressions:
  - use words for the 1st, and
  - numerals for the second

Example: Five 3-people groups
NOT
5 3-people groups

Punctuations: 1/2

Punctuation marks are conveyors of meaning. Incorrect dealing with them can actually mislead the reader, destroy the grammar, or change the meaning of the sentence.

Apostrophe	Ohm's law / Can't / two months' delay
Brackets	He came last night [Monday] / According to [1]
Colon	We used three levels: good, average, and poor / A ratio of 1:2
Comma	Because he is late, he missed the meeting / Black, white, and red are basic colors / Mohammed, President, chaired the meeting
Dash	He – accompanied by his son – traveled home
Ellipses	(…) represent deleted text material

Punctuations: 2/2

Hyphens (soft):	Divides a word into two parts between the end of one line and the start of the next. *(With word processing, it is not needed)*
Hyphens (hard):	Sixty-seven pages / Two-thirds of a mile A blue-gray mix
Parentheses	as shown in Table (3) / the equations (above) are important / Objectives of trip: (1) attend a short course, and (2) view equipment.
Periods	To put an end after completing a sentence.
Semicolon	The speed is about 120 km/hr; traffic is difficult; police is not present / Meeting was attended by: Mohammed, Vice President; Tariq, accountant; and Ahmed, secretary.

Passive Voice / Active Voice

- **Passive Voice:**
  Has been done: avoiding "I" and "We" and emphasizing issues (traditional English technical writing).
- **Active Voice:**
  I / we have done it: using "I", "We" (in use in American English technical writing)

The END

Outline

- Introduction
- Guidelines for a Good Presentation
- The Questions Session
- Examples of “Bad” Slides

Department of Electrical Engineering
King Saud University

EE 399
Lecture 5

Guidelines for Good Presentations

Guidelines for Good Presentation

- Know your audience
  - Know the technical levels in your audience
  - Do not speak to one level and ignore the others
  - Start with basic and careful introduction and leave the highly technical material to the end
  - Summarize the key point at the end

Introduction

- Public Speaking is a necessity of professional life
- Your oral presentation is a presentation of yourself
- Your ability to do your job may be questioned by your colleagues if you seem nervous or confused
- Clarity, self-assurance, and skill get you the respect of the audience

Guidelines (continued)

- Be sensible about transparencies
  - Allow 1 or 2 minutes per transparency
  - Avoid transparencies with one or two lines
  - Avoid transparencies that are packed with too much information
  - No need to write full sentences
  - Learn where the light switch, the focus, and the pointer are BEFORE your talk
  - Think of where you will stand

6

Guidelines (continued)

- Minimize complex math
- Time your talk
  - It is a crime to exceed the allotted time
  - Virtually any subject can be presented in any amount of time
  - Time limit does not mean present only generalities
  - A figure, table, or equation that does not specifically serve the point MUST go
  - Never attempt to squeeze your talk

5

Guidelines (continued)

- Communicate with the audience
  - Do NOT stare into the space above your audience, the floor or the transparencies
  - Pick out several friendly faces and establish eye contact (read the feedback)
  - Do NOT ignore any section in the room
  - Speak up (most people tend to start their presentation with a soft voice)

8

Guidelines (continued)

- Practice & practice your talk
  - Unless you are a specially gifted speaker, REHEARSE
  - Rehearse in front of friends, spouse, colleagues, or alone (loudly)
  - Avoid writing your talk and reciting it
  - Resist the temptation to speak too quickly
  - Overcome any nervous mannerism

7

Examples of Bad Transparencies

Too small to be read

- Let your questioner finish the question
- Be prepared to rephrase the question
- Keep your answer short (stick to the point)
- Never argue with your questioner (deflect hostile questions)
- Confess your ignorance

The Questions Session

- Let your questioner finish the question
- Be prepared to rephrase the question
- Keep your answer short (stick to the point)
- Never argue with your questioner (deflect hostile questions)
- Confess your ignorance

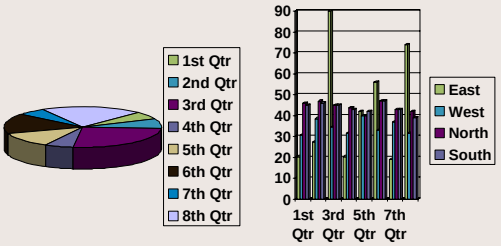
Examples (continued)

Practically empty

- A good speaker can sell virtually any idea

Examples of Bad Transparencies

Packed chart



EE 399
Lecture 6
Writing CV's and Letters

Introduction

- CV is first step toward successful job search
- A good CV often facilitates the interview and increase chances of the candidate
- Interview is the one of the most critical components of job searching
- Both sides (you and the interviewee) have the same goal (do you fit to the position and does the position fit for you)
- Interview is a valuable opportunity to present your strengths and assess available position

Key Sections of CV

- Date of CV
- Personal data
- Educational degrees
- Employment history (if applicable)

Optional Sections of CV

- Professional memberships
- Government and extra-educational awards received
- Projects worked on and major undertakings
- Training courses and workshops attended
- List of publications (if applicable)
- Hobbies and personal interests.

Example of a CV

DATE January 2003

PERSONAL DATA

Name: Abdulaziz Muhammad
Date of Birth: June 21, 1979
Place of Birth: Jeddah, Saudi Arabia
Nationality: Saudi
Marital Status: Single
Home Address: 21 Al-Jazeerah St., P.O. Box 300, Riyadh 11432, Saudi Arabia.

EDUCATION

Year	Degree	Institution	Field
2001	B.Sc. (Top Class)	King Saud Univ.	Electrical Engineering
1997	High-School Diploma	Al-Olaya School	-

Example of a CV (continued)

EMPLOYMENT HISTORY

1. Engineer, Operation Department, Saudi Electricity Company (June 2002 - present)
2. Assistant Engineer, Al-Muhandes Engineering Firm (August 2001- June 2002)

PROFESSIONAL MEMBERSHIPS

- Member, Engineering Committee, Saudi Arabia (since 2001)
- Member, Institute of Electrical & Electronics Engineers (IEEE)

TRAINING COURSES

- Computer Skills Workshop, Engineering Committee, Riyadh (May 1-5, 2002)

HOBBIES AND INTERESTS

- Soccer, horse-riding and reading

Letter Purpose

- A letter can have many purposes such as (among others):
  - inform
  - persuade
  - sell
  - request
  - instruct
  - recommend
  - To complain.
- Knowing your purpose and your reader will help you decide what to say and how to organize and phrase it.

Letter Reader

- The more you know about your reader, the more closely you can tune your writing
- How much does your reader know about the topic of the letter?
- How does the topic affect the reader personally?
- What will make the reader want to read what you have to say?
- Is your reader likely to agree or disagree with your suggestions?

Letters Formats

- The most widely used business letter formats are:
  - Full block
  - Modified block
- The format of the letter helps to establish its tone

Full block format

- It has eight components (in order):
  - Heading
  - Address
  - Salutation
  - Text of the message. Do not indent the paragraphs, but leave an empty line between paragraphs
  - The complimentary close
  - Your signature should be in blue or black ink
  - The identification line containing your typed name
  - Enclosures or distribution

An Example (Full Block)

Your Address

September 16, 2004

Receiver's name and address

Dear Mr. ….:

Text with no indentation but skip a line between paragraphs

Sincerely yours,

Signature goes here with pen

Your Name

Encl: List of attachments
Dist: List people receiving a copy

Modified Block Format

- Differs from full block in the placement of the heading, date, complimentary close, signature, and identification lines
- These components start about halfway across the page and aligned vertically
- Begin the paragraphs with a one-tab or three to five space indentation
- Do not leave an empty line between paragraphs

An Example (Modified Block)

Your address

September 16, 2004

Receiver's name and address

Dear Mr. ....:

Your text here indented but no empty line between paragraphs.

Sincerely yours,

Your signature goes here with ink

Your name

Encl: List of attachments
Dist: List people receiving a copy

Reviewing Letters

- Check your letter for tone, wording, and spelling
- Check the spelling of the receiver's name and address
- Check the dates in the heading and any dates in the text. These are supposed to be records
- Check for subject-verb agreement
- Check for punctuation
- Be sure that you signed the letter below the complimentary close

This is how much letter writing you will probably do.

Do it right!

QUESTIONS?

EE 399
Lecture 7

Introduction to Academic and Business Proposals

1

Objectives

- Familiarize with key principles and styles of writing proposals
- Gain competence in preparing a business proposal in which you are involved

2

What is a Proposal?

- A document outlining the objectives, methodologies, tasks and costs associated with a proposed project
- ***Examples of a Project:***
  - Research and development project submitted for external funding
  - Undergraduate thesis project or graduate study program (Master or Ph.D.)
  - Internal company project
  - Others

3

Successful Proposals

- Written with the “sponsor” in mind
- Should be convincing and appealing enough to gain support and acceptance
- Should have clear objectives, credible methodology and realistic budget

4

Contents of a Proposal

A) Objectives of the project
Should be clear and should reflect the goals to be achieved when the project is completed.

B) Problem description
should outline the nature of the problem to be tackled in the proposed project, its level of difficulty and the importance of its solution.

C) Survey of previous relevant studies
Should outline existing information pertaining to the problem on hand as well as previous attempts documented in the literature toward its solution.

5

Contents of a Proposal (continued)

D) Methodology (approach) to be followed

- ✓ Must be credible and free from complexity and ambiguity.
- ✓ Should explain the method used for solving the problem on-hand.

6

Contents of a Proposal (continued)

E) Tasks to be undertaken

- ❑ The list of tasks to be carried out during the project should be sequential, realistic and accomplishable.
- ❑ A task statement should indicate the precise work assignment to be undertaken.
- ❑ Unlike the objective and methodology statements, the task statement is often associated with a specific product in mind, or a deliverable item.

7

Contents of a Proposal (continued)

F) Project cost outline and time-schedule

Example:

1)	Hardware & Accessories	SR	20,000
2)	Support Software Programs	SR	50,000
3)	Investigators	SR	40,000
4)	Students & Research Assistants	SR	20,000
5)	Administration & Secretarial	SR	10,000
6)	Material & Supplies	SR	10,000
7)	Travel	SR	10,000
	TOTAL COST	SR	160,000

8

Contents of a Proposal (continued)

Example of Project Schedule:

PROPOSED PROJECT SCHEDULE
(Assuming a Start Date of January 1, 2003)

WORK ACTIVITY	TASK DURATION IN MONTHS (FROM START OF PROJECT)											
	1	2	3	4	5	6	7	8	9	10	11	12
Task 1 *Updated Literature Survey*												
Task 2 *Theoretical Developments*												
Task 3 *Software Developments*												
Task 4 *Applications*												
Task 5 *Results& Documentation*												

9

Contents of a Proposal (continued)

G) Background information on project investigators

- The information on project investigator(s) should include previous work experience in the field, and should be sufficient to judge the ability to carry out the project.
- A copy of the personal resume or curriculum vita (CV) for each investigator is often attached to the project proposal.

10

The END

11

EE 399
Lecture 8

Successful Interviews and Engineering Ethics

Interview Structure

- **Greeting:**
  - To break the ICE and get you relaxed
  - It is the moment of 1st impression (probably the lasting one)
  - It is the time to pass your business card and updated CV
  - Avoid starting with complains
- **Discussion:**
  - You will be asked questions related to your CV, background, personality, interests, values, career values
  - Ensure that you communicate essential information about yourself even if you are not asked about them
- **Closing:**
  - It is terminated by the interviewer
  - Ask you questions before you leave
  - Summarize your strengths and reaffirm your interest
  - If you do not know, ask politely about the next step

Before the Interview

- **Make self-assessment:** to determine your goals, preferred work style, your strengths, and weaknesses
- **Prepare for expected questions:** many questions are generic, such as:
  - Tell us about yourself
  - Why you are interested in our company
  - What kind of work do you expect
  - Why are you planning to change your employee
  - What is your reaction in the following cases
  - How do you spend your vacation
  - What are your plans after five years
  - What is the last book you have read
- **Research the new employer:** to identify your suitable strengths, and evaluate the opportunity

After Interview

- Record your impression and comments to help you evaluate this opportunity versus others
- Send a thankful letter to the interviewer and reassure your interest in the position
- If the interview is a screening one, expect a call for another one

General Guidelines

- Arrive 15 minutes before starting time
- Be honest but not negative about yourself
- Answer the unsaid question
- Never criticize your current or old employer
- Expect some technical questions
- Expected a question about expected salary
- Ask necessary questions
- Do not ask about your benefits before the offer
- Give specific examples for your achievements
- Return requested information on time
- Try to be disciplined and refrain from telling jokes

Receiving an Offer

- It is received either via a letter or phone call
- Take some time to think about it, it is not expected to reply immediately, however, know the deadline!
- At this stage, discuss every thing clearly: salary, vacations, benefits, working hours, place of work, policy of promotions, retirement policy, incentives, responsibilities, and evaluation process.
- If not sure, you may ask whether you can negotiate the details of the offer or not
- Reply within the deadline, either by YES or NO

Engineering Ethics

- Engineering profession values
- Engineering behavior attributes
- Code of conduct in the engineering practice
- Responsiveness to society norms and needs
- Responsiveness to public and worker safety

Engineering Ethics - Issues

- Handling, storing and disposing of hazardous materials
- Accepting gifts and amenities
- Conflict of interest and engineering codes of ethics
- Report falsification and ethical misconduct
- Social obligations
- Miscommunication between engineers and fabricators
- Engineering responsibility versus management decisions
- Safety negligence of subordinates

IEEE Code of Ethics

- to accept responsibility in making engineering decisions consistent with the safety, health and welfare of the public, and to disclose promptly factors that might endanger the public or the environment;
- to avoid real or perceived conflicts of interest whenever possible, and to disclose them to affected parties when they do exist;
- to be honest and realistic in stating claims or estimates based on available data;

IEEE Code (contn'd)

- to reject bribery in all its forms;
- to improve the understanding of technology, its appropriate application, and potential consequences;
- to maintain and improve our technical competence and to undertake technological tasks for others only if qualified by training or experience, or after full disclosure of pertinent limitations;
- to seek, accept, and offer honest criticism of technical work, to acknowledge and correct errors, and to credit properly the contributions of others;

IEEE Code (contn'd)

- to treat fairly all persons regardless of such factors as race, religion, gender, disability, age, or national origin;
- to avoid injuring others, their property, reputation, or employment by false or malicious action;
- to assist colleagues and co-workers in their professional development and to support them in following this code of ethics

The END

EE 399
Lecture 9

Group Dynamics and Management Skills

1

Introduction

- The Competitiveness is largely determined by the performance and effectiveness of team work
- A group will be more effective if it acquires some skills
- Two types of skills needed:
  - Individual skills
  - Group skills

2

Important Group Dynamics Skills

- Running business meetings
- Negotiation of agreements
- Decision making
- Problem solving
- Motivating others
- Managing conflicts
- Stress management

3

Definitions

- **Team:** group of people with a leader dedicate their time for a certain task
- **Committee:** group of people with a chairman assigned to do a certain task besides their regular work
  - Standing committee: continuous task
  - Ad-hoc committee: short-term task
- **Task force:** a team formed from various entities

4

Effective teams and Committees

- Select suitable leader or chairman in terms of:
  @ Leadership @ Experience @ Vision
- Select suitable members in terms of:
  @ Education @ Age @ Time
  @ knowledge @ Experience @ Coherence
- Make task clear in terms of:
  @ Objectives @ Resources @ Time frame
  @ Deliverables @ Reporting @ Procedure

5

Leader/chairman Duties

- Choosing members
- Running meetings
- Setting up executive plan
- Distributing sub-tasks
- Quality assurance
- Solving internal conflicts
- Reporting to top management
- Interfacing with externals

6

Meetings

- Face-to-face meetings
- Virtual meetings
  - Teleconferencing
  - Videoconferencing
  - E-mail

7

Meeting Agenda

- Includes all items to be discussed
- Sent to all members ahead of the meeting by a reasonable time
- It is usually the team or committee secretary duty to prepare and distribute the agenda
- Agenda should match the allocated time of the meeting

8

Minutes of Meeting

- It is a documentation of the meeting proceedings, attendees, and decisions
- It is the leader/chairman duty to ensure recording them or assign some one to do so (secretary usually does this task)
- It has to be approved by all members
- A copy is sent to all members soon at the end or shortly after the meeting
- It should be revised at the beginning of next meeting

9

Running Effective Meetings

- Start and finish on time and stick to agenda
- Avoid reading long documents
- Give all member a chance to express opinions
- Encourage positive and creative thinking
- Postpone unexpected issues to next meetings
- Avoid arguments during meetings
- Use brainstorming in some situations
- Do not enforce your opinion
- Avoid lobbying, domination, and polarization
- Motivate members
- Relate good and important news

10

The END

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