

**FACULTY of ENGINEERING and INFORMATION TECHNOLOGY
DEPARTMENT of ENGINEERING**

ENGN6612 and ENGN4612 Digital Signal Processing and Control

Tutorial A: DSPC Technology – Semester 2, 2005

1. Introduction

This tutorial activity will give you the opportunity to learn about an application of DSPC technology that interests you. This activity also gives you experience in distilling information, and presenting it to others in written and verbal form.

2a. Aims and Objectives

Tutorial A – DSPC technology

- to acquaint students with modern applications of DSPC
- to develop in students the ability to
 - self-learn
 - find, analyse and evaluate information
 - interpret information and communicate via written report and verbal presentation

2b. Mode of Operation

Tutorial A – DSPC technology

1. discuss and decide on suitable topic for investigation
2. discuss and investigate topic
3. distill information
4. write report
5. deliver presentation

3. Selection of Topic

The table later in this document provides (incomplete) lists of keywords relevant to DSPC technology at various levels. This may assist you in selecting and researching your topic.

Things to consider:

1. What do you currently know about DSPC and applications?
2. What DSPC technology applications particularly interest you?
3. What would you like to learn more about?
4. How will you research DSPC topics?

4. What is expected in the report?

1. Up to 20 pages in length.
2. Quality professional standard presentation using word processor.
3. Clear discussion of the application and its context. Should be comprehensible to a non-technical person.
4. Clear discussion of how DSPC or related theory is used in the application. Should be comprehensible to other students in the class.
5. All source material must be fully acknowledged and documented. Students are reminded of the University's plagiarism policy: *copying of material from books, magazines, internet or anywhere else is strictly prohibited*. What you write must be in your own words.

5. What is expected in the presentation?

1. Duration to be specified.
2. Quality professional standard presentation using computer projection.
3. Clear and concise discussion of your chosen DSPC technology topic designed to give classmates the main ideas.

6. Assessment

The assessment weighting for this part of the course is as follows:

Tutorial A	ENGN4612	ENGN6612
DSPC Technology Report	30%	20%
DSPC Technology Presentation	10%	10%

In order to receive marks for this part of the course, students must

1. attend at least 80% of the presentations, and
2. submit a one page description of the topic as specified below.

The presentation will be marked by members of the audience.

7. Groups

Students may work in *groups of up to 3 people*. It is the responsibility of group members to ensure that all members participate in a fair and equitable manner. In general, all members of a group will receive the same mark, though this may be moderated in cases of poor participation. Any difficulties should be resolved early in the semester.

8. One Page Topic Description

This should specify:

1. the DSPC technology you wish to investigate
2. names of group members, and the responsibilities of each member
3. the context in which the technology is used
4. the key technical features and relevant theory used
5. what you wish to achieve in your investigation

9. Due Dates

1. Week 5 - one page description of the topic due.
2. Week 11- report due.
3. Weeks 12-13 – presentations will be scheduled.

10. Use of Scheduled Tutorial A Time

This is up to you. It can provide a minimum amount of contact among group members. I will be available for consultation during these times.

Here is what I recommend:

- Weeks 2 – 5
 - form groups
 - discuss possible topics
 - discuss methods for research
 - discuss technical issues
- Weeks 6 – 11
 - In-depth research of topic
 - Detailed discussion of technology and context
 - Preparation of report and presentation

11. Notes:

Clear discussion of the application and its context. Should be comprehensible to a non-technical person.

This item should reflect a high level of understanding of the technology application in a relevant context and exercise analysis, evaluation and communication skills.

Clear discussion of how DSPC or related theory is used in the application. Should be comprehensible to other students in the class.

This item should reflect technical depth of understanding and exercise communication skills.

word	thing	symbol	structure	process
Digital audio, video and photo				
<ul style="list-style-type: none"> album music movie video photograph stereo sound surround sound 	<ul style="list-style-type: none"> photograph CD Digital TV DVD DVDA SACD Camera Microphone Encoder Decoder Disc recorder Disc player Amplifier Speakers Display Printer ADC DAC Signal model Filter Photo editor Mobile phone 	<ul style="list-style-type: none"> codec MP3 miniDV MPEG JPEG Dolby THX SDTV HDTV Photoshop 	<ul style="list-style-type: none"> Digital data Physical disc layout Codes Surround sound formats Recording device Playing device Sound system AV system Industry standards Music industry Film industry 	<p>Recording</p> <ul style="list-style-type: none"> image and/or sound capture encoding/compression data storage disc burning <p>Playing</p> <ul style="list-style-type: none"> data retrieval disc reading decoding/decompression image and/or sound creation
Digital automation				
<ul style="list-style-type: none"> cruise control temperature regulation flight control robot control 	<ul style="list-style-type: none"> controller ADC DAC Thermostat Avionics Sensors Actuator Digital controller System model Filter 	<ul style="list-style-type: none"> Automatic system Feedback State space ARMA PID LQG 	<ul style="list-style-type: none"> Digital data control architecture feedback loop digital system technology context industry context 	<p>feedback control</p> <ul style="list-style-type: none"> capture sensor data compute feedback control apply control action