Department of Mathematical Sciences: Division of Applied Mathematics

TW793 Digital Image Processing

Course Information 2019

Lecturer

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Prescribed Textbook

R. C. Gonzalez and R. E. Woods, Digital Image Processing, Prentice-Hall, (Third Edition) 2008. The textbook is available in the department.

Web Page

Course documentation is at https://appliedmaths.sun.ac.za/TW793

Lectures

Day	Time	Venue
Tuesday	10:00-10:50	A409
Wednesday	09:00-09:50	A409
Friday	09:00-09:50	A409

Assignments

An assignment is handed out more or less every third week. Each assignment primarily contains computer-orientated problems that you have to solve in Matlab or any other programming language, for example Python. After the completion of each assignment, you have to hand in a neat printed report. The due dates for these reports are indicated on the next page. Late reports will not be accepted.

Question sessions

Occasionally informal question sessions may be scheduled on an ad hoc basis outside the formal lecture times in room A409. During these sessions you are free to ask programming or concept related questions on the relevant assignments and discuss the assignments among yourselves.

Class Tests

You will write two class tests during the semester. The purpose of the class tests is to evaluate your knowledge of the theoretical aspects of the course. The preliminary dates for these tests are as follows:

Test	Date	Time	Venue	Chapter
1	Friday, 6 September 2019	14:00-16:00	A409	3-5
2	Friday, 8 November 2019	09:00-11:00	A409	6, 8-11

Continuous Evaluation and Performance Mark

This module is evaluated continuously. Your performance mark is a weighted average of your assignment mark and your class test mark. The weights are as follows:

Performance mark					
Five assignments:	5	$\times$	16%	=	80%
Two class tests:	2	$\times$	10%	=	20%
					100%

Course Planning TW793 Second Semester 2019

This outline may be adjusted slightly.

Week	Date	Lecture	Assignment due	Chapter in the textbook	Subject
1	Mo, 22 Jul			LECTURES START	
	Tu, 23 Jul	1		1,2	*Orientation*, fundamentals, overview
	We, 24 Jul	2		3	Basic grey scale transformations
	Fr, 26 Jul	3		3	Basic grey scale transformations
2	Tu, 30 Jul	4		3	Histogram equalization
	We, 31 Jul	5		3	Spatial filters
	Fr, 2 Aug	6		3	Spatial filters
3	Tu, 6 Aug	7		Notes	Fourier analysis (overview/revision)
	We, 7 Aug	8		Notes	Fourier analysis (overview/revision)
	Fr, 9 Aug			**Public holiday**	
4	Tu, 13 Aug	9	**1**	4	DFT
	We, 14 Aug	10		4	DFT
	Fr, 16 Aug	11		4	Filters: spatial/frequency domain
5	Tu, 20 Aug	12		4	Filters: frequency domain
	We, 21 Aug	13		4	Filters: frequency domain
	Fr, 23 Aug	14		4	Implementation
6	Tu, 27 Aug	15		5	Image restoration
	We, 28 Aug	16		5	Image restoration
	Fr, 30 Aug	17	**2**	5	Image restoration
7	Tu, 3 Sep	18		6	Colour processing
	We, 4 Sep	19		6	Colour processing
	Fr, 6 Sep	20		6	Colour processing
	Fr, 6 Sep	[A409: 14:00-16:00]		**CLASS TEST 1** (Chapter 3-5)	
	Fr, 6 Sep			LECTURES END	
S E P T E M B E R H O L I D A Y S					
8	Mo, 16 Sep			LECTURES RESUME	
	Tu, 17 Sep	21		8	Image compression
	We, 18 Sep	22		8	Image compression
	Fr, 20 Sep	23		8	Image compression
9	Tu, 24 Sep			**Public holiday**	
	We, 25 Sep	24		9	Morphological filters
	Fr, 27 Sep	25	**3**	9	Morphological filters
10	Tu, 1 Oct	26		9	Morphological filters
	We, 2 Oct	27		9	Morphological filters
	Fr, 4 Oct	28		10	Image segmentation
11	Tu, 8 Oct	29		10	Image segmentation
	We, 9 Oct	30		10	Image segmentation
	Fr, 11 Oct	31		10	Image segmentation
12	Tu, 15 Oct	32	**4**	11	Representation and description
	We, 16 Oct	33		11	Representation and description
	Fr, 18 Oct	34		11	Representation and description
13	Tu, 22 Oct	35		11	Representation and description
	We, 23 Oct	36		-	Capita Selecta
	Fr, 25 Oct	37		-	Capita Selecta
	Fr, 25 Oct			LECTURES END	
	Fr, 1 Nov		**5**		
	Fr, 8 Nov	[A409: 09:00-11:00]		**CLASS TEST 2** (Chapter 6, 8-11)	

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