



Global Initiative of Academic Networks

5 Day Course on

MATHEMATICAL METHODS FOR IMAGE PROCESSING

23RD –27TH OCTOBER, 2017

Department of Mathematical and Computational Sciences,
National Institute of Technology Karnataka, Surathkal, India–575025

TENTATIVE PROGRAMME SCHEDULE

Day 1: 23 rd October, 2017			Venue
08:00 – 09:30	Participant's Registration		Main Building Seminar Hall
09:30 – 10:15	Inaugural Function		-do-
10:15 – 10:30	Tea Break		
10:30 – 11:30	Introduction to Image processing and Mathematical optimization (Lecture 1)	Prof. Francois Malgouyres	-do-
11:30 – 12:30	Smooth optimization (Lecture 2)	Prof. Francois Malgouyres	-do-
12:30 – 13:30	Lunch Break		
13:30 – 14:30	Image denoising using the H1 regularization : mathematical analysis . Part 1 . (Introduction to Lab session 1) (Lecture 3)	Prof. Francois Malgouyres	-do-
14:30 – 16:30	Hands on session (Lab session 1)	Dr. Jidesh P	MACS LAB
Day 2: 24 th October, 2017			Venue
10:00 – 11:00	Non-smooth optimization (Lecture 4)	Prof. Francois Malgouyres	Main Building Seminar Hall
11:00 – 12:00	Image restoration : The total variation (Lecture 5)	Prof. Francois Malgouyres	-do-
12:00 – 13:00	Lunch Break		
13:00 – 14:00	Image denoising using the H1 regularization : mathematical analysis . Part 2 . (Introduction to Lab session 2) (Lecture 6)	Prof. Francois Malgouyres	-do-
14:00 – 16:00	Hands on session (Lab session 2)	Dr. Jidesh P	MACS LAB
Day 3: 25 th October, 2017			Venue
10:00 – 11:00	Applications for image denoising, deblurring, inpainting and for restoring compressed images (Lecture 7)	Prof. Francois Malgouyres	Main Building Seminar Hall
11:00 – 12:00	Sparsity based regularization, from Non-linear approximation to compressed sensing for the L0 minimization . (Lecture 8)	Prof. Francois Malgouyres	-do-
12:00 – 13:00	Lunch Break		
13:00 – 14:00	Image zooming using the total variation regularization (Introduction to Lab session 3) (Lecture 9)	Prof. Francois Malgouyres	-do-



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14:00 – 16:00	Hands on session (Lab session 3)	Dr. Jidesh P	MACS LAB
Day 4: 26th October, 2017			Venue
10:00 – 11:00	Sparsity based regularization – compressed sensing for the L1 minimization (Lecture 10)	Prof. Francois Malgouyres	Main building Seminar Hall
11:00 – 12:00	Introduction to other image processing problems : image segmentation and registration (Lecture 11)	Prof. Francois Malgouyres	-do-
12:00 – 13:00	Lunch Break		
13:00 – 14:00	Image de-quantization (Introduction to Lab session 4) (Lecture 12)	Prof. Francois Malgouyres	-do-
14:00 – 16:00	Hands on session (Lab session 4)	Dr. Jidesh P	MACS Lab
Day 5: 27th October, 2017			Venue
09:00 – 10:00	Image denoising methods (Lecture 13)	Dr. Jeny Rajan	LHC Seminar Hall
10:00 – 10:10	Tea Break		
10:10 – 11:10	Image reconstruction some remarks (Lecture 14)	Prof. Santhosh George	-do-
11:10 – 12:10	PDE and Variational regularization models for image restoration (Lecture 15)	Dr. Jidesh P	-do-
12:10 – 13:10	Lunch Break		
13:10 – 14:10	PDE and variational methods for image restoration/enhancement (Lecture 16)	Dr. Jidesh P.	-do-
14:10 - 15:00	Valedictory Session		
15:00 – 17:00	Matlab demonstration of regularization models and hands on session (Lab Session 5)	Dr. Jidesh P	MACS LAB