Lab Session Details on Page two

Wk	No	2016/17	Lecture content	Learn Sect.	Lecture content	Readings
1	0	Thurs Sep 22	Introduction	None	Overview of the course, Applications for robotics and vision, The challenge, Historical highlights. NO LEARN MATERIAL	M Ch 1, M 6.6-7, R & N 25.1, 25.8
2	V1	Mon Sep 26	Image and Capture I	I.1, II-2	Vision Introduction, Image Basics, Image Physics	R & N 24.1-2
2	V2	Thurs Sep 29	Image and Capture II	II.3-II.6	Capture Problems, Image Geometry, Matlab Examples, Homography	R & N 24.3
3		Mon Oct 03			**No Lecture**	
3		Thurs Oct 06			**No Lecture**	
4	V3	Mon Oct 10	Image Segmentation I	III.1-III.5	Motivation, Thresholding-based segmentation, 2D Convolution, Background removal, Mean-shift segmentation	R & N 24.3
4	V4	Thurs Oct 13	Description of Segments	IV.1-IV.3	Introduction, Moment descriptors, Shape signatures	
5	V5	Mon Oct 17	Simple Object Recognition	V.1-V.5	Recognition, Probabilistic Object Recognition, Multivariate Gaussian, Distribution Model, Shape Recognition	
5	V6	Thurs Oct 20	Matching and Active Vision (quiz)	V.6, VI-1-VI.2	Chamfer-Based Shape Matching, Active Vision, Visual Attention	
6	R1	Mon Oct 24	Sensing the world	I	Sensors, Factors that affect capability, Contact sensing, Proximity and range sensors, Occupancy grids	M: 6, 11.1-11.3; R & N Ch 24, Ch 25.2-3
6	R2	Thurs Oct 27	Effectors and Actuators	II	Mechanisms, Degrees of freedom, locomotion: wheels, legs, manipulation: arms, grippers, Methods of actuation	R & N 25.2
7	R3	Mon Oct 31	Introduction to Robot Control	VI	Control Problems, tasks needing control, Linear dynamic models	R & N 24.6
7	R4	Thurs Nov 3	Control 2: Open-loop Control	VII	Process characteristics, Forward models, Open-loop control	M 2,4; R & N 25.6-7
8	R5	Mon Nov 7	Control 3: Feedback control	VIII	Open loop, feed-forward and feedback control. Proportional error and integral error control, Second order system model	
8	R6	Thurs Nov 10	Control 4: PID control (quiz)	IIX	PID Control, Tuning, Limitations and Summary, Robot architectures	
9	R7	Mon Nov 14	Reaching and Grasping, Visual Servoing	III, V	3D coordinate systems, Joints, kinematics, specifying robot positions, Grippers, contact & grasping. Visual servoing	R & N Ch 25.2
9	R8	Thurs Nov 17	Sensing self-motion	IX	Self-sensing, Proprioception; position, velocity and Odometry, Navigating with beacons, Haptic perception	M 6.4-5; R & N: 24.6, 25.2-3

Wk	Lab Sessions and due dates	
1	No Lab session	
2	Intro to Matlab	
3	Intro to image processing 1	Assignment announced
4	Intro to image processing 2, start assignment	
5	Vision assignment	
6	Vision assignment due Thur Oct 27 at 4pm. Assessed Fri Oct 28	
7	Intro to Robotics 1	Assignment announced
8	Intro to Robotics 2. start robotics assignment	
9	Robotics assignment	
10	Assignment due Thurs Nov 24 at 4pm. Assessed Fri Nov 25	

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