

SGGS Institute of Engineering and Technology, Vishnupuri, Nanded
Department of Information Technology

Ph. D. Course work for candidates registered in 09-2010 and 2010-2011 for Paper-3 and Paper-4

01	Name of the candidate	Mr. Arun Biradar
	Registration Number	2009PIT001
	Email-id, Contact number of the candidate	arunbiradar@hotmail.com 09945410132(M)
	Name of the Guide(s)	Dr. Ravindra C. Thool
	Subject of Ph. D.	Genetic Algorithm Based Intelligent routing For Wireless Ad-hoc Networks Using Local Caching and Topology Mapping for next Generation Networks
	Title of Paper-3	Wireless and Mobile Networks
	Title of Paper-4	Mobile and Wireless Network Security and Privacy
	Year of Registration	June -2009

02	Name of the candidate	Mr. Uke Nilesh J
	Registration Number	2009PIT002
	Email-id, Contact number of the candidate	nileshuke@yahoo.com , 09850035805(M)
	Name of the Guide(s)	Dr. Ravindra C. Thool
	Subject of Ph. D.	Detection and Tracking of Moving Objects in Video
	Title of Paper-3	Computer Vision
	Title of Paper-4	Digital Imaging
	Year of Registration	June -2009

03	Name of the candidate	Mrs. Arati J. Vyavahare
	Email-id, Contact number of the candidate	aratijv@gmail.com 09881024150 (M)
	Registration Number	2009PIT003
	Name of the Guide(s)	Dr. Ravindra C. Thool
	Subject of Ph. D.	Studies and Development of Segmentation Techniques for colour image Processing
	Title of Paper-3	Computer Vision
	Title of Paper-4	Pattern Recognition and machine Vision
	Year of Registration	June -2009

The syllabus for paper-3 and paper-4 mentioned in the above table in front of candidate name is given below:

Wireless and Mobile Networks

Basics of Cellular and Wireless Data Networks - Wireless Local Area Networks: Medium Access Control Protocols including IEEE 802.11 standards -Quality of Service – Security - Energy Efficiency Wireless Personal Area Networks - Wireless Metropolitan Area and Wide Area Networks -Wireless Internet, Wireless Network Transport Protocols–Mobile Ad Hoc Networks: Routing, Protocols, Quality of Service , Energy Management, and Security – Wireless, Sensor Networks.

TEXT BOOKS

1. Ad Hoc Wireless Networks : Architectures and Protocols , by C. Siva Ram, Murthy and B.S. Manoj, Prentice Hall PTR, 2004.
2. Mobile Communications , by Jochen Schiller , Addison – Wesley , 2000.
Wireless Network Evolution , by 2 G to 3 G , Vijay K. Garg , Pearson Education, 2002.
3. Mobile Internet : Enabling Technologies and Services, by Apostolis K. Salkintzis, CRC Press,
4. IP / Mobile Satellite Networks, John Farserotu, Ramjee Prasad, APTECH, HOUSE INC, 2002.
5. The Wireless Mobile Internet : Architecture, Protocols and Services, Abbas Jamalipour, John Wiley and Sons , 2003.

Mobile and Wireless Network Security and Privacy

Research Directions in Security and Privacy for Mobile

and Wireless Networks :Introduction , The State of the Art, Areas for Future Research, Challenges for standard wireless networks, 802.11 Wireless Networks (Wi-Fi), 3G Wireless Networks , Challenges for sensor networks, Challenges for mesh and ad hoc networks , Challenges related to mobility , Security for new/emerging wireless technologies , General Recommendations for Research ,

Pervasive Systems: Enhancing Trust Negotiation

with Privacy Support , Introduction . Trust Negotiation., Weaknesses of Trust Negotiation., Extending Trust Negotiation to Support Privacy , Proposed Trust Protocol Extended to Support Privacy , Privacy Agreement.

Applying Trust in Mobile and Wireless Networks: Introduction , Attack Analysis for MANETs , Passive attacks , Active attacks , Existing Trust Models, The PGP trust model, Decentralized trust mode, Distributed trust model., Distributed public-key trust model , Subjective logic trust model., Recent Trust Models, Ant-based trust algorithm, Using cooperative games and distributed trust ,computation in MANETs , Using semi rings to evaluate trust in MANETs

A Framework for Computing Trust in Mobile

Ad-Hoc Networks :Introduction ,Related Work,Proposed Model, Understanding different malicious behavior ,The model Trust Model Against Selfish Behavior,Trust Model Against Malicious Accuser, Conflict Resolution. Trust Model Against Malicious, Topology Change

The Concept of Opportunistic Networks and their

Research Challenges in Privacy and Security : Introduction , Goal for opportunistic networks, Seed oppnets, helpers, and expanded oppnets, Impacts of oppnets , Related Work in Privacy and Security ,Privacy and security solutions in pervasive computing ,Privacy and security solutions in ambient networks,Privacy and security solutions in grid computing ,Privacy and security solutions based on trust and reputation in open systems ,Privacy and security solutions based on intrusion detection ,Privacy and security solutions based on honeypots and honeyfarms Protecting data privacy, Multicast from the Controller,Messages from Nodes to the Controller , Ensuring data integrity , Authentication of oppnet nodes and helpers, Proposed solutions for dealing with specific attacks , Intrusion detection., Honeypots and honeyfarms..

On Performance Cost of On-demand Anonymous

Routing Protocols in Mobile Ad Hoc Networks:Introduction, Mobile sensor networks ,On-demand routing ,Overview.,Anonymous Routing Revisited. Anonymous routing not based on the on-demand approach, ANODR ., SDAR, Summary ., Performance Evaluation , Crypto-processing performance measurement, Simulation model ,Routing performance measurement, Related Work.

Hardware/Software Solution to Improve Security

in Mobile Ad-hoc Networks :Introduction Background and Related work , Detection, identification, and isolation of malicious nodes. Secure and QoS-aware routing Comprehensive Software/Hardware Schemes for Security in Ad-hoc Networks. ,Detecting misbehavior, identifying and isolating malicious nodes ,Software Monitoring, Hardware Monitoring , Software/Hardware Monitoring ,Secure, QoS-aware routing, Software Techniques , Hardware Support , Implications and Future Research

Reference books

Mobile and Wireless Network Security and Privacy, Edited by S. Kami Makkiter Reiher, Kia Makki, Niki Pissinou, Shamila Makki, Mobile and Wireless Network Security and Privacy

Computer Vision

Image Formation Models:Monocular imaging system, Orthographic & Perspective Projection, Camera model and Camera calibration Binocular imaging systems

Image Processing and Feature Extraction:Image representations (continuous and discrete), . Edge detection

Motion Estimation: Regularization theory,Optical computation,Stereo Vision,Motion estimation, Structure from motion

Shape Representation and Segmentation :Deformable curves and surfaces, Snakes and active contours, Level set representations, Fourier and wavelet descriptors,Medial representations, Multiresolution analysis

Object recognition :Hough transforms and other simple object recognition methods, Shape correspondence and shape matching, Principal component analysis, Shape priors for recognition

Reference books :

Computer Vision - A modern approach, by D. Forsyth and J. Ponce, Prentice Hall
Robot Vision, by B. K. P. Horn, McGraw-Hill.

Pattern recognition and Machine vision

1. Modeling : Maximum likelihood estimation and linear models, Least squares fitting, multidimensional models , Fitting a polynomial, unbiased model and prediction, Non-linear modeling and fitting, Principal components regression and cross- validation, introduction to kernel methods

2. Classification : The least mean square classifier, Fisher's discriminant Classification using a Mahalanobis and other distance functions, Discriminant function and the maximum Likelihood discriminant , Bayes minimum error rate and minimum risk discriminant Multi-Category Classification: LMS approximation, LDA and other Approaches, eg. Nearest neighbor, Classifier performance, Non-linear kernel methods, Non-linear regression and Levenberg-Marquardt algorithm

3. Image formation: Homographies; mapping from a plane to a plane Euclidean, affine and projective invariants ,cross-ratios, Application to plane figures and canonical frame of reference, Landmark point and Procrustes alignments, Principal components analysis, active shape models, Multi-scale methods

4. Flexible shape and Appearance models : Incorporating the intensity, pixel and geometry, hierarchical PCA Application and FEM Extensions of statistical models, Estimation theory

5. Kalman filtering: Linear Kalman filters and extensions, Application to corner tracking, motion estimation and 3D data fusion, Feature matching, differential and hierarchical approaches Epipolar and motion constraints: F matrix

6. Stereo and motion Estimation : Optical flow and motion field, Over-determined systems and multiple camera stereo, Application: tracking ,stereo data fusion and surface Triangulation Feature-based approaches, graph matching and interpretation tree

7. Object recognition: Object recognition from invariants and use of geometrics hashing, Recognition by linear combination of views and virtual views, Eigenspace multi-view methods, applications

Reference Books

1. C Bishop , Neural Network for Pattern Recognition, OUP
2. R O Duda, P E Hart , D G Stock, *Pattern Classification*, John Wiley and Sons, Second edition, 2001
3. E Trucco and A verri, *Introductory Techniques foe 3-D Computer Vision*, PHI
4. R Jain,R Kasturi, *Machine Vision*, McGraw Hill
5. Forsyth D , Ponce, *Computer Vision: A modern approach*, PHI

for Mrs. Arati J. Vyavahare

DIGITAL IMAGING

DIGITAL IMAGE PROCESSING FUNDAMENTALS : Image Processing Systems - Elements of Visual perception - Image Sensing and Acquisition – Image Sampling and Quantization - Basic pixel relationship - Image Transforms - Discrete Fourier Transform - Discrete Cosine Transform - Hadamard Transform - Color Image Fundamentals – Color Models - RGB, HSI, YIQ - RGB to HSI and HSI to RGB conversion.

IMAGE ENHANCEMENT : Enhancement in Spatial Domain - Basic gray level transformations - Histogram processing – Spatial filtering - Smoothing - Sharpening - Enhancement in frequency Domain - Smoothing and Sharpening frequency domain filters.

IMAGE CODING AND COMPRESSION : Image Coding Fundamentals – Image Compression Model - Error Free Compression – Variable Length Coding, Huffman, Arithmetic, RLC, Lossless Predictive coding – Lossy Compression techniques - Predictive Coding - Transform Coding - Image Compression Standards – JPEG, MPEG.

IMAGE SEGMENTATION AND REPRESENTATION :Detection of discontinuities - Point, Line and Edge detections - Gradient operators - Thresholding Representation schemes - chain codes - Polygon approximation - Boundary descriptors – Simple descriptors - Shape numbers - Fourier descriptors.

TEXT BOOKS

1. *Gonzalez and Woods, “Digital Image Processing”, 2nd Edition, Pearson Education, 2002.*
2. *S. Annadurai and R. Shunmugalakshmi, “Fundamentals of Digital Image Processing”, Pearson Education, 2007.*
3. *Anil.K.Jain, “Fundamentals of Digital Image Processing”, Pearson Education, 2004.*

REFERENCE BOOKS

1. *Kenneth R Castleman, “Digital Image Processing”, Prentice Hall, New Delhi, 1995.*
2. *Milman Sonka, Vaclav Hlavac, Roger Boyle, “Image Processing, Analysis, and Machine Vision”, Brooks/Cole, Vikas Publishing House, 2nd Edition, 1999.*
3. *Forsyth and Ponce, “Computer Vision, A modern Approach”, Person Education, 2003.*