CURRICULUM VITAE

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Educational Qualification

I am currently in the fourth year of B.E. (Hons.) Computer Science course at Birla Institute of Technology and Science (BITS), Pilani, India. My educational qualifications to date are as follows:

BE (Hons.) Computer Science	Birla Institute of Technology & Science, Pilani, India	2003	9.21
II PUC (equivalent to XII)	Pre University Board, Karnataka	1999	96.33%
SSLC (equivalent to X)	Karnataka Secondary Education Exam. Board	1997	92.48%

Awards/ranks

1. Tech Fiesta 2001 – National-level technical paper presentation conference at PSG Tech, Coimbatore, India – I prize.
2. IWDC (4^{th} International Workshop on Distributed Computing) 2002 – co-authored paper has been accepted for presentation.
3. National Talent Search Exam (NTSE), 1997 – Karnataka state Rank 19 (DSERT, Bangalore, India).
4. National Talent Search Exam (NTSE), 1997 – National level scholar (NCERT, Delhi, India).
5. II Pre. Univ. Exam. 1999 – State rank 3 (PU Board, Karnataka).
6. Karnataka Common Entrance Test (CET) – Engineering 1999 – Rank 4.
7. Karnataka Common Entrance Test (CET) – Medical, 1999 – Rank 25.
8. State-level science lecture competition, 1997 Genetic Engineering – Scope, Potential and Impact, organized by VITM, Bangalore, India and DSERT, Bangalore, India Rank 2.
9. Selected for a six-month research project at the University of Trento, Italy as part of the Practice School II programme conducted by BITS, Pilani.

Research Interests

Exact and approximation algorithms for combinatorial optimization, computer graphics, mobile computing.

Projects undertaken

Virtual Private Networks (VPN): [***January 2002 – May 2002***] The aim of this project was to provide a VPN-based solution to the existing BITS network by configuring CISCO equipment (routers of 7100 series, Network Access Servers (NAS)). I was part of the team that worked in the BITS-CISCO lab, setup by BITS in collaboration with CISCO. A virtual private network provides a secure interconnection between client computers connected over a public internetwork. A tunnel is setup between the communicating clients. Data sent through the VPN tunnel is encrypted at one end and decrypted at the other end. As part of the initial test-bed, we set up a VPN tunnel between two local networks, and provided access to this tunnel using a NAS and a gateway.

Frequency Assignment Problems (FAP): [***August 2001 – May 2002***] This was a study oriented project with the aim of optimizing radio-frequency usage for wireless communication networks. The given wireless network is modeled as a graph with the vertices of the graph representing base-stations of the network and the edges representing possible radio-interference. Finding an optimal frequency assignment for the network is equivalent to finding an optimal graph coloring of the corresponding graph. Our project team arrived at new results for optimally coloring graphs corresponding to bi-dimensional topologies. We also arrived at optimal and near-optimal results for coloring d-dimensional square grids and cellular network topologies. We presented our results in a paper, *"Optimal Grid $L(2, \vec{1}_k)$ colorings"* at "Tech Fiesta, 2001" a national-level paper presentation conference (PSG Tech., Coimbatore, India). Our paper won the first place. Also, our paper *Channel Assignment in Wireless Networks Modeled as d-dimensional Square Grids* has been accepted for IWDC, 2002, to be held in December 2002 at Kolkata, India.

SMS-GSM: [***May 2001 – July 2001***] The aim of this project was to code part of the SMS-GSM protocol-stack at the client-side (mobile handset) of a GSM network. We coded the Transport layer and the Relay layer of the protocol-stack in C, successfully in accordance with the GSM standard 03.40, specified by ETSI. This project was undertaken as part of Practice School-I (PS-I) programme, conducted for students at the end of their second year by BITS, Pilani, India, in collaboration with U&I System Designs Pvt. Ltd., Bangalore, India.

3D object viewer: [***APOGEE 2001***] This project was part of the prize-winning working-model exhibits of the Computer Science Association at APOGEE 2001, the annual academic festival of BITS, Pilani, India. This was a graphics program developed in C, which enabled the user to visualize simple three-dimensional objects in real-time. Given the coordinates of the endpoints that make up the object, the program generated a realistic perspective view of this object from a specified view-point in space.

Current Projects

Dynamic Channel Assignment problems: I am doing this project at **Information Technology Group, Central Electronics Engg. Research Institute, Pilani, India.** I am doing this project at Information Technology Group, Central Electronics Engg. Research Institute, Pilani, India. Dynamic channel assignment schemes enable a cellular system to adapt flexibly to different load situations, thereby increasing the throughput and decreasing call blocking. The specific set of available channels in a cell may change from time to time due to sharing of channel resources between cells. Also, heuristic algorithms like the ANTS algorithm help us to arrive at "good" solutions to combinatorially hard problems like the channel assignment problem in a short time. The ANTS algorithm can be parallelized, thus decreasing execution time. This project involves formulating learning algorithms for distributed dynamic channel assignment, and parallelizing the ANTS algorithm to solve the static and dynamic versions of the problem.

Motion of an Autonomous Guided Vehicle (AGV): I am doing this project at the **Centre for Robotics and Intelligent Systems, BITS, Pilani, India.** I am doing this project at the Centre for Robotics and Intelligent Systems, BITS, Pilani, India. The aim of this project is to develop efficient algorithms for guiding an AGV through an obstacle filled path from a start point to a predefined goal. Currently, we are studying a new real-time obstacle avoidance method for mobile robots, named the Vector Field Histogram (VFH). This method permits the detection of unknown obstacles and avoids collisions while simultaneously steering the mobile robot towards the target.

Work experience

U&I System Designs Pvt. Ltd., Bangalore, India: As part of Practice School-I (PS-I) programme, conducted for students at the end of their second year by BITS, Pilani, India, I spent two months from May 2001 July 2001 in this company. My project team worked on the SMS-GSM protocol-stack, which was an active project in the company at the time. We coded part of the protocol-stack at the client-side of the network.

Student co-instructorship: As a student co-instructor, I supervised 18 students who underwent the PS-I program in three companies: U&I System Designs Pvt. Ltd., Yuken India Ltd., Rao Insulating Co. Pvt. Ltd., all at Bangalore, India. I assisted the BITS faculty in evaluation, assessment and monitoring of the students, and also provided technical assistance to the students. This was done as part of Practice School-I (PS-I) programme, conducted for students at the end of their second year by BITS, Pilani, India, between May 2002 July 2002.

Publications/Conferences

1. Amrita Pati, Aniket Nagesh Dubhashi, Anil M. Shende, Shashank R. and Shashanka M V S. *"Channel Assignment in Wireless Networks Modeled as d-dimensional Square Grids"*. to appear in the 4^{th} *International Workshop on Distributed Computing (IWDC)*, 2002, Kolkata, India.

2. Amrita Pati, Devyani Gupta and Shashank R. *"Optimal Grid $L(2, \vec{1}_k)$ colorings"*. presented at Tech Fiesta, 2001: national-level technical symposium by PSG Tech., Coimbatore, India. the paper won the first place.

Skill sets

Operating Systems	MS-DOS, Windows, UNIX, Linux.
Programming Languages	C, Verilog HDL, Lisp, UNIX Shell Programming, Assembly Languages (8085, 8086, Pentium).
Scripting Languages	Sed, Awk, Perl.
Documentation	Microsoft Office, TEX, LATEX typesetting-languages.
Database Systems	SQL, PL/SQL, Developer 2000.

Interests/extra-curricular activities

- Good knowledge of photography; experience as a core-member of the Department of Photography (DOPY), BITS, Pilani, India.
- Interested in theater; acted in and directed Kannada plays; also acted in an English street-play during OASIS, 2001 – the annual cultural festival of BITS Pilani, India.
- Secretary of Kannada Vedike, a regional association of BITS, Pilani, India.
- Executive committee member of BITS Alumni Association (BITSAA) – actively involved in communicating with alumni of the institute.

Personal details

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