

Department of Computer Science
 Rensselaer Polytechnic Institute (RPI)
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OBJECTIVE To pursue doctoral studies in Computer Science and Engineering starting Fall 2008, with an emphasis on research in robotic sensor networks.

EDUCATION *Master of Science*, Computer Science
 Rensselaer Polytechnic Institute, Troy, NY
 Expected graduation: August 2008 GPA: 3.94/4.00
 Thesis title: The Role of Sensing in Pursuit-Evasion Games.

Bachelor of Engineering (Honors), Computer Science and Engineering
Master of Science (Honors), Mathematics
 Birla Institute of Technology and Science (BITS), Pilani, India
 August 2001 - May 2006 Cumulative GPA: 9.08/10.00
 Undergraduate thesis: Generation of Steiner Minimal Trees using Modified Neural Self-Organization Technique.

RESEARCH EXPERIENCE *Research Assistant* Fall 2007 - present
Pursuit-Evasion Games, with Dr. Volkan Isler
 Department of Computer Science, Rensselaer Polytechnic Institute

- Derived theoretical results for pursuit-evasion games with sensing limitations, played on graphs as well as in continuous environments.
- Implemented pursuit strategies on an ARM-based mobile robot testbed in our Robotic Sensor Networks laboratory.

Undergraduate Thesis Fall 2005
Generation of Steiner Minimal Trees using Modified Neural Self-Organization Technique, with Dr. Atanendu Sekhar Mandal
 Central Electronics Engineering Research Institute, Pilani, India

- Presented an algorithm for Steiner Trees in the Euclidean metric, designed to collapse an initial solution into a minimal configuration.
- Developed effective techniques to obtain suitable initial conditions.
- Studied the performance of an update based on gradient descent using randomly generated and library data sets.

Research student Fall 2004
Optimal bandwidth reservation for Hose-Model VPNs, with Professor Chittaranjan Hota and Sriram Subramanian
 Birla Institute of Technology and Science, Pilani, India

- Designed a bandwidth allocation scheme for virtual private networks that support the Hose model for allocation of bandwidth.
- Compared and contrasted it to the pipe-model, with an emphasis on requirement specification from customers as well as Internet service providers.

COMPUTER SKILLS *Languages & Software:* C, C++, Java (core, servlets), x86 Assembler, Matlab.
Operating Systems: Microsoft Windows (98, XP), Unix, Linux (Debian, Ubuntu).
Graphics and geometry: OpenGL, SDL, Allegro library, Cinderella, KSEG.

PUBLICATIONS

- V. Isler and N. Karnad. *The role of information in the cop-robber game*. Theoretical Computer Science, 399 (3), p.179-190, Jun 2008.
- N. Karnad and V. Isler. *Bearing-Only Pursuit*. Proc. IEEE Int. Conf. on Robotics and Automation, p.2665-2670, May 2008.
- A. S. Mandal and N. Karnad. *Generation of Euclidean Steiner Minimal Trees using Modified Neural Self-Organization Approach*. Submitted to IEEE VLSI Design and Test Symposium (VDATE), India, 2008.

INDUSTRIAL EXPERIENCE

Research Programmer Intern Spring 2006
Nearest neighbor search in higher dimensions, with Dr. Manik Varma
Microsoft Research, Bangalore, India

- Developed a k-D tree based search algorithm for similarity queries.
- Performed computer-aided statistical analysis of our algorithm on randomly-generated data sets.

Software Development Intern Summer 2003
MIDAS: Machine Inventory Data Administration System, with Mr. S. K. Jha, Mr. S. Venkataraman, Anand Bhaskaran, and S. Ramakrishnan
Indian Overseas Bank, Chennai, India

- Designed and developed an inventory management system, consisting of a database and a front-end.
- Led a survey team to collect inventory statistics, cumulated across all departments of that branch of the organization.

TEACHING EXPERIENCE

Teaching Assistant Fall 2006 - Spring 2007
Rensselaer Polytechnic Institute
Graph Theory and Computer Science I. Conducted review lectures, designed homework assignment problems, monitored lab sessions and graded tests.

RELEVANT COURSES

Rensselaer Polytechnic Institute Fall 2006 - Spring 2008
Fundamentals of Robotics, Robotics II, Geometric Optimization for Robotics, Optimal Control Theory, Computability and Complexity, Computer Algorithms, Randomized Algorithms, Operating Systems, Programming Languages, Computer Architecture.

Birla Institute of Technology and Science August 2001 - May 2006
Discrete Structures for Computer Science, Image Processing, Network Programming, Software for Embedded Systems, Algebra I and II, Topology, Real Analysis, Differential Geometry, Numerical Analysis, Control Systems, Linear Algebra, Optimization, Operations Research, Microprocessors and Interfacing, Digital Electronics.

COMMUNITY SERVICE

Robotics Outreach.
Participated in introducing middle-school students to applications in mobile robotics. Spring 2008.

EXTRA-CURRICULAR ACTIVITIES

Student member, IEEE and ACM.
Vice President, RPI Aikido Club.
Past Member, RPI Taekwondo Club.
Hobbyist Game programmer. Member of teams that developed 2D games Fireboy and Afterburn (<http://home.gna.org/afterburn/>), and 3D game Cardiac Arrest.
Hobbyist artist. Work available on deviantArt at <http://scribbleink.deviantart.com/>.
Participant in intramural sports teams for volleyball and cricket.