Ravi Tandon

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C-6 Sector E (New) Aliganj,
Lucknow, Uttar Pradesh - 226024, India
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RESEARCH INTERESTS

- Wireless Sensor Networks
- File Systems
- Human Computer Interaction

EDUCATION

- *Bachelors of Technology*, Computer Science and Engineering
  Indian Institute of Technology-Guwahati, GPA 9.0/10
- *Senior Secondary*, Red Rose Senior Secondary School, Lucknow
  2006-2008, Marks - 90%
- *High School* Montfort Inter College, Lucknow
  2004-2006, Marks - 84%

PUBLICATIONS

- Determination of Optimal Number of Clusters in Wireless Sensor Networks.
  Ravi Tandon, **International Journal of Computer Networks and Communications (IJCNC) Volume 4, Number 4**.
- Adaptive Lagrangean Clustering Protocol.
  Ravi Tandon, Biswanath Dey, Sukumar Nandi, **accepted in The Second IEEE International Conference on Parallel, Distributed And Grid Computing(PDGC-2012)**

MAJOR PROJECTS

Lagrangean Clustering Protocol - Wireless Sensor Networks
Ravi Tandon, Biswanath Dey, Guide - Prof. Sukumar Nandi

- Studied various clustering schemes used in wireless sensor networks. Developed an energy efficient clustering scheme that uses Lagrangean Clustering heuristic in the formation clusters.
- Proposed *Adaptive Lagrangean Clustering Scheme (ALCP)* for homogeneous networks and *Distributed Lagrangean Clustering Scheme (DLCP)* for heterogeneous networks.
- ALCP has been accepted in The Second IEEE International Conference on Parallel, Distributed And Grid Computing(PDGC-2012).

Sensor Network Model-Wireless Sensor Networks
Ravi Tandon

- Developed a theoretical model for the determination of optimal number of cluster heads in clustered sensor networks. This model is called *Unequal Probability Election Model (UEPEM)*.
- Developed a protocol *Optimal Cluster Election Protocol (OCEP)* based on the model proposed in UEPEM. Comparison with existing protocols such as CODA and LEACH was done. Results showed OCEP outperforms existing clustering approaches.
- Determination of Optimal Number of Cluster Heads in Wireless Sensor Networks published in International Journal on Computer Networks and Communications, (vol. 4, no. 4).

Weight Based Clustering In Wireless Sensor Networks-Wireless Sensor Networks
Ravi Tandon, Guide - Prof. Sukumar Nandi

- Proposed a clustering protocol that assigns weights to sensor nodes based on their residual energy. Simulation studies showed that this clustering approach (WBCHN) improves the energy efficiency over similar approaches (such as HEED and GC).

Cluster Head Reelection Protocol for Heterogeneous Wireless Sensor Networks
Ravi Tandon, Guide - Sukumar Nandi

- Proposed a clustering approach that elects cluster heads in two different phases. The novelty is in cluster reorganization to ensure that the sensor node with the highest residual energy becomes a cluster head.
- Simulation of SEP, LEACH and FAIR was done. Comparison with existing protocols showed that CRP elects cluster heads in a better manner and prolongs the lifetime of sensor network.

Recovery Protocols For Flash File Systems - Undergraduate thesis August '11 - April'12
Ravi Tandon, Guide - Prof. Gautam Barua

- Literature survey on existing protocols that support transactions in traditional file systems. Study of log-structured file systems.
- Designed protocols that recover file system state from a system crash or a user transaction abort.
- Implementation of protocols on an open source flash file system (YAFFS) and integration of transactional file system [1] with YAFFS was done.

Design Improvements In Pint Operating System - Operating Systems August'10 - December'10
Ravi Tandon, Aditya Yadav, Arjun Bora, Guide - Prof. J.K Deka

- Thread Management - Provided synchronization support to the threads. Implemented a thread scheduler.
- User Programs - Enabled user programs to interact with the OS via system calls.
- Virtual Memory - Provided user programs support of an extended virtual memory. It required study of page table, the supplemental page table, the swap table implementation, management of memory mapped files and management of the frame table.
- File Systems - Provided support for extensible files, implemented buffer cache, subdirectories and system calls that read and write to a directory.

INTERNSHIPS

Ubiquitous Computing - Human Computer Interaction May'11 - July'11
Guide - Prof. Andrew Kun
University of New Hampshire, USA

- Designed innovative interfaces using bottle caps, battery cells, hand gloves etc. for interacting with a Microsoft Surface.
- Built applications for efficient data visualization and integration of Matlab with Microsoft Surface APIs.
- Performed user study and analysis of interfaces developed using eye-tracking, heart rate monitoring and NASA-TLX (subjective workload assessment tool).

Multi-Modal Interface Design - Human Computer Interaction May'10 - July'10
Guide - Dr. Shriram Revankar, Mentor - Anant Gilra
Adobe Advanced Technology Labs, India

- Developed a generic interface for unifying multiple modalities of providing input for interacting with various applications.
- Worked with Android APIs. Combined touch and speech into a single gesture.

MISCELLANEOUS PROJECTS

CPU Design - Computer Architecture January'10 - April'10
Ravi Tandon, Aditya Yadav, Guide - Prof. S.B. Nair

- Designed control logic for a 4-bit Microprocessor with an ALU, Register Set and 256 X 4 bit RAM based on Micro programmed Control, 4 bit data bus, 8 bit address bus. Implemented 16 Arithmetic, Logic and Procedure Call instructions.

Compiler Design January'11 - April'11
Ravi Tandon, Aditya Yadav, Guide - Prof. Santosh Biswas

- Designed and implemented an LL Parser and a SLR Parser for a subset of the C language.

Assembler-Loader Design January'10 - April'10
Ravi Tandon, Aditya Yadav, Guide - Prof. Santosh Biswas

- Designed and implemented an assembler and a loader for assembly level instructions of a subset of x86 architecture.

TERM PAPERS

Analysis of Distributed Clustering Protocols January'11 - April'11
Ravi Tandon, Guide - Prof. Diganta Goswami

- Analyzed different protocols for clustering wireless sensor networks in an energy efficient manner. Proposed a distributed protocol (Adaptive Lagrangean Clustering Protocol) for homogeneous sensor networks. Performed preliminary simulations.

Dynamic Content Caching January'12 - April'12
Ravi Tandon, Guide - Prof. T. Venkatesh

- Surveyed various caching techniques that have deployed on the World Wide Web. Besides, three different architectures for dynamic content caching have been analyzed. Also problems associated with them and their prospective solutions have been discussed.

Page Ranking : Distributed Randomized Algorithms August'12 - Decemeber'12
Ravi Tandon, Ketan Singh, Guide - Prof. Diganta Gowsami, Prof. Sushanta Karmakar

- Analyzed problems associated with page ranking and the various solutions that have been proposed to tackle the isssue. A critical analysis of the Distributed Randomized, "Random Surfer modeled page ranking algorithm used by Google was done. A study of several prior arts such as the "Poor Man's Page Ranking, "Block Ranking Algorithm, "OPIC (On-Line Page Importance Computation) Algorithm was done.

SCHOLASTIC ACHIEVEMENTS

- Qualified state level of NATIONAL TALENT SEARCH EXAMINATION (62%)
- Secured AIR 649 in 4th NCO (National Cyber Olympiad) , AIR 522 5th NCO (National Cyber Olympiad) , and AIR 833 in 6th NSO (National Science Olympiad)

EXTRA-CURRICULAR ACTIVITIES

- Member of National Sports Organization for Lawn Tennis.
- Participated in various debates at the school level.
- Organized Manual Robotics in Techniche 2009.

DISCALIMER

I hereby claim that the above is correct up to my knowledge.

RECOMMENDATIONS

Recommendations are available on request.

HOMEPAGE

`http://www.ravi-tandon.com`

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References

[1] Deka, L. and Barua, G., *On-line consistent backup in transactional file systems.* Proceedings of the first ACM asia-pacific workshop on Workshop on systems, pages-37-42, 2010.