

Dinesh Kumar

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Objective:

Obtain summer internship position to apply & augment my systems development, computer science research & analytical modeling skills. I am interested in designing & building complex real systems based on transformational research.

Current Position:

Second year Ph.D student in Computer Science specializing in computer/communication networks in the Maestro group at INRIA research laboratory, Sophia Antipolis, France (<http://www-sop.inria.fr/maestro/>).
Supervisor: Dr. Eitan Altman.

Education:

5-year Integrated Master of Technology (Bachelor + Master), Indian Institute of Technology (IIT), Delhi, India. Graduated in May'01. **Major:** Mathematics and Computing.

Patents:

- “An Improved TCP based Channel Switching Policy for Common and Dedicated Channels in 3G UMTS Downlink”, Dinesh Kumar, Dhiman Barman, Eitan Altman, Jean-Marc Kelif. Filed in European Patent Office by France Telecom R&D, May 2006.

Conference Publications:

- “Modeling & Performance Analysis of a Fountain Codes based Transport in IEEE 802.11 WLANs”, Dinesh Kumar, Tijani Chahed, Eitan Altman. *Under Submission*.
- “User-Network Association in an 802.11 WLAN & 3G UMTS Hybrid Cell: Individual Optimality”, Dinesh Kumar, Eitan Altman, Jean-Marc Kelif. To appear in Proceedings of IEEE Sarnoff Symposium, Princeton, USA, 2007.
- “Globally Optimal User-Network Association in an 802.11 WLAN & 3G UMTS Hybrid Cell”, Dinesh Kumar, Eitan Altman, Jean-Marc Kelif. To appear in Proceedings of 20th International Teletraffic Congress (ITC-20), Ottawa, Canada, 2007.
- “Route Lifetime based Optimal Hop Selection in VANETs on Highway: An Analytical Viewpoint”, Dinesh Kumar, Arzad A. Kherani, Eitan Altman. Proceedings of IFIP Networking, Coimbra, Portugal, 2006.
- “Capacity Optimizing Hop Distance in a Mobile Ad Hoc Network with Power Control”, Dinesh Kumar, Ramaiyan Venkatesh, Anurag Kumar, Eitan Altman. Proceedings of 4th Intl. Symposium on Modeling and Optimization in Mobile, Ad Hoc, and Wireless Networks (WiOpt), Boston, USA, 2006.
- “A Structural Property of Solutions to Path Optimization Problems in Random Access Networks”, A. A. Kherani, D. Kumar, E. Altman. Proceedings of 4th Intl. Symposium on Modeling and Optimization in Mobile, Ad Hoc, and Wireless Networks (WiOpt), Boston, USA, 2006.
- “Cooperative and Non-Cooperative Control in IEEE 802.11 WLANs”, Eitan Altman, Anurag Kumar, Dinesh Kumar, R. Venkatesh. Proceedings of 19th International Teletraffic Congress (ITC-19), Beijing, China, 2005.
- “Recovering Camera Motion and Mobile Objects in Video Documents”, Damien Paulin, Dinesh Kumar, Raghav Bhaskar, Georges Quenot. International Workshop on Content-Based Multimedia Indexing, University of Brescia, Italy, 2001.

Work in Progress:

- “Wiener Filtering Estimation of Covering Population in a G/G/ ∞ type Sensor Network Spread”, Dinesh Kumar, Eitan Altman, Tamer Basar.
- “An End-to-End Transport Protocol for Fountain Coded Traffic”, Dinesh Kumar, Tijani Chahed, Eitan Altman.
- “Modeling and Analysis of HTTP-1.1 type TCP connections in a tandem WLAN-WiMax Network”, Vinod Sharma, Eitan Altman, Dinesh Kumar.

Invited Talks:

- “Simulation Study of a Reliable Open Loop Transport for Fountain Coded Traffic in UMTS and WLAN Downlinks”, Dinesh Kumar, Tijani Chahed. EuroNGI Annual Cellular-2 Meeting, Pisa, Italy, Oct. 2006.

Book Chapters:

- “Recovering in Video Documents”, Georges M. Quenot, Philippe Mulhem, Damien Paulin, Dinesh Kumar, Raghav Bhaskar and Arvind Bhusnurmath, “Multimedia Mining: A Highway to Intelligent Multimedia Documents” edited by Chabane Djeraba, chapter-5, pages 83-112. Kluwer, 2002.

Professional Experience:

06/2001 - 01/2005: *Software Development Engineer* at Amadeus, Sophia Antipolis, France

Responsible for a system analysis project to study and propose a solution for integration of various back-end host simulators and tools. Responsible for a proof of concept validation for a new architecture to be used as a common platform for all applications in Amadeus. The architecture involves a web-browser control based thin-client skeleton with XML technology for all cross-network communication and data sharing. Defined & developed new version of Alcyon product used by Air France for flight/hotel/car reservation (Object oriented programming). Designed & developed SNCF rail seat-map component for Vista product. (UML, XML, XSL(T) coding)

05/2000 - 07/2000: *Summer Internship* at ENS-IMAG (Institute of Math. and Comp. Sc.), Grenoble, France

Worked on 3D-shape & motion recovery from video sequences for Video Indexing purposes. (C, Mesa-OpenGL, Numerical Recipes coding)

05/1999 - 07/1999: *Summer Internship* at Citicorp Information Tech. Industries Ltd., Bangalore, India

Worked on a data-mining project for developing rule based classifiers for financial applications.

Professional Services:

External reviewer for PIMRC'05, ICC Wireless Communications'06, VTC Spring'06, Networking'06, VTC Fall'06, Globecom'06, ISWCS'06, Computer Networks journal, Wireless Networks journal, IEEE Network Magazine, Infocom'07, Sigmetrics'07.

Computer Skills:

- *Kernel & Systems Building:* Modified the TCP and Network layer protocol stack in Linux kernel for implementing a new end-to-end transport protocol for Fountain Coded traffic. Various parameters related to delayed acks, timeouts, congestion window and fast retransmit procedure in both TCP 'input' and 'output' modules were tweaked to obtain optimal performance. Development and debugging were carried out in User Mode Linux (UML) before migrating the final code into a host kernel for performance evaluation of the protocol on real Internet.
- *Simulators:* Developed a simulator in Java of a Vehicular Ad hoc Network (VANET) in order to study the dynamics of optimal next hop selection based on route lifetime. Apart from this I have also carried out extensive simulation work with Network Simulator (ns) for studying the performance of a new packet scheduling policy in 3G UMTS downlink channels and performance comparison of TCP with a new Fountain Coded packet based transport in an 802.11 WLAN setting.
- *Development Cycle:* Working as a Software Development Engineer, I have experience of going through the complete software development cycle starting from product definition, analysis, design, development, integration, testing and on-time delivery to the client.
- *Programming Languages:* C, C++, Java, Visual C++, Visual Basic, Perl, PL/SQL
- *OS familiarity:* Windows XP/2000/NT, Linux, Unix- SunOS, IRIX, AIX
- *Packages Used:* User Mode Linux (UML), Network Simulator (ns), Matlab, Maple, Numerical Recipes (nr), Rational Rose, Winrunner

Awards and Distinctions:

- IFIP travel grant for Networking 2006 conference.
- ORACLE India Scholarship for being among the top 6 students in the class at IIT-Delhi.
- 2 Gold Medals at National and State level each for best science model exhibit at National Science Fair, 1996.
- Award for 2nd best dissertation, Dept.of Maths, IIT-Delhi, 2001.
- Obtained 154th position in the National Level Mathematics and Science Talent Search Examination (total participants approx. 100,000)

References:

- 1) Dr. Eitan Altman
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- 2) Dr. Anurag Kumar
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- 3) Jean-Marc Kelif
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- 4) Dr. Georges Quenot
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