

Varun Khare

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U.S.A *Citizenship:* India

OBJECTIVE To obtain Software Engineering position in Product Development team utilizing research skills in Networking.

RESEARCH INTERESTS I am primarily interested in the design of systems that can meet the growing demands for disseminating popular content on the Internet through Content Delivery Networks (CDN) and proposed future Internet architectures such as Named Data Networking (NDN).

EDUCATION **University of Arizona**, Tucson, Arizona USA
Ph.D. Computer Science, G.P.A: 3.727, September 2011

- Title: “Building Economic Efficiency into Multicast Content Delivery Networks”
- Advisor: Beichuan Zhang

MS Computer Science, G.P.A: 3.625, May 2007
St. Mary’s University, San Antonio, Texas USA (graduated **Cum Laude**)
BS Computer Science, G.P.A: 3.76 and Mathematics, G.P.A: 3.95 (double major), May, 2005

RESEARCH EXPERIENCE **Department of Computer Science, University of Arizona**, Tucson, Arizona, USA
Research Assistant *Advisor: Beichuan Zhang* **Spring 2007 - Present**

ROMaN: Revenue Driven Overlay Multicast Network *INFOCOM’ 09, ICDCS’ 11*

- Research focuses on reducing operational bandwidth cost of Content Delivery Networks (CDN).
- I have developed CDN Request Routing algorithms that exploit concave ISP charging functions and 95th percentile charging to reduce cost and provide good network performance.
- Identified routing preference mismatch between CDN and ISPs. Proposed economically incentive-driven approach to make CDN and ISP routings mutually beneficial.

NDN: Named Data Networking *in-progress*

- NDN, funded by the NSF Future Internet Architecture program, moves communication paradigm from “where”, i.e. addresses, to “what”, i.e. the content, which is of interest to user applications.
- I studied the data delivery resilience properties of NDN architecture during prefix hijacking, link congestion and failure.

eFIT: Enabling Future Internet Innovation via Transit Wire *J-SAC’ 10*

- The eFIT project funded by the NSF NeTS FIND program, focuses on routing scalability issues faced by the Internet Routing Architecture.
- I proposed an evolutionary path towards Internet routing scalability through route aggregation, which removes unnecessary topological details from routing tables.

LRL: Large Route Leaks *submitted to INFOCOM’ 11*

- Detect Large Route Leaks (LRL) on the Internet when an unauthorized network hijacks prefixes of several networks. Sponsored by the Homeland Security under the WIT project.
- I have designed and implemented a prototype LRL detection algorithm. Detected LRL events from past 3 years have been verified by network operators.

PROFESSIONAL
EXPERIENCE

Economics and Business Research Department, University of Arizona, Arizona, USA
Database Manager and Web Developer **August, 2005 - May 2007**

- I have implemented an online library catalog with search functionality. Developed project on .NET framework using C# language and SQL Server 2005.
<http://ebr.eller.arizona.edu/data/library/Query.aspx>

Advanced Corporate Technology Sun Microsystems, Inc. (StorageTek)
Corporate Headquarters, Louisville, Colorado, USA *Research Assistant* **Summer 2004**

- Designed a storage solution for an archiving product that managed a billion signatures, representing several billion files. Implemented running prototype using C language.

Corporate Communications Sun Microsystems, Inc. (StorageTek)
Corporate Headquarters, Louisville, Colorado, USA *Web Developer* **Summer 2003**

- Conceptualized and developed web-pages capturing the function of Employee Communication Department and “Global Talent Acquisition” project.

TEACHING
EXPERIENCE

LAC (Learning Assistance Center) *Tutor*
St. Mary’s University, San Antonio, Texas **August 2002 - May 2005**
Tutored students in Calculus and Finite Mathematics, C and C++ programming courses.

Mathematics Department *Teaching Assistant*
St. Mary’s University, San Antonio, Texas **August 2004 - May 2005**
Graded homework assignments, taught discussion sections, and conducted office hours for various mathematics courses taught by Prof. Paul X. Uhlig.

PROFESSIONAL
ACTIVITIES

- External Reviewer for ICCCN (2007), J-SAC (2010), GLOBECOM (2010), IJNGC (2011)
- Organized weekly group meetings of PhD and MS students in “Network Research Lab” under Prof. Beichuan Zhang.
- Member of IEEE and ACM

JOURNAL
PUBLICATIONS

[1] **Varun Khare**, Dan Jen, Xin Zhao, Yaoqing Liu, Dan Massey, Lan Wang, Beichuan Zhang and Lixia Zhang. “Evolution Towards Global Routing Scalability”. In *Proc. of IEEE Journal on Selected Areas in Communication, Internet Routing Scalability, J-SAC’ 10*

CONFERENCE
PUBLICATIONS

[1] **Varun Khare** and Beichuan Zhang. “Making CDN and ISP Routings Symbiotic”. In *Proc. of IEEE International Conference on Distributed Computing Systems, ICDCS’ 11*.

[2] **Varun Khare** and Beichuan Zhang. “Towards Economically Viable Infrastructure-based Overlay Multicast Networks”. In *Proc. of IEEE International Conference on Computer Communications, INFOCOM’ 09*.

[3] **Varun Khare** and Bongki Moon. “PRISS: storage and querying of XML documents using Prime Number Labeling Scheme”. In *Proc. of International Conference on Internet Information Retrieval* (December 2006)

WORKSHOP
PUBLICATIONS

[1] Kevin P. Coogan, **Varun Khare**, Stephen G. Kobourov and Bastian Katz. “Multi-Scale Dead-Reckoning Algorithm for Distributed Force-Directed Sensor Network Localization”. In *6th Workshop on Algorithms for Sensor Applications, ALGOSENSORS’ 10*.

[2] Praveen Rao, Justin Campos, **Varun Khare**, Bongki Moon and Beichuan Zhang. “NetX: Unified Data-Centric Internet Services”. In *Proc. of International Workshop on Networking Meets Databases, NetDB’ 07*.

INVITED TALKS

“CORE-OMN: Cost Aware Request Routing for Overlay Multicast Networks” Varun Khare and Beichuan Zhang
IEEE ICDCS 2011, Minneapolis, Minnesota, USA, June 2011

“Large Route Leak Detection” Qing Yu, Varun Khare and Beichuan Zhang
North American Network Operators’ Group (Nanog) 49, June 2010

“Evolution Towards Global Routing Scalability” Varun Khare, Beichuan Zhang and Lixia Zhang, Internet Engineering Task Force (IETF) 74, March 2009

- Global Routing Operations (grow) Session
- Routing Research Group (RRG) Session

“ROMaN: Revenue-driven Overlay Multicast Network” Varun Khare and Beichuan Zhang

- IEEE INFOCOM 2009, Rio de Janeiro, Brazil, April 2009
- PhD Oral Qualifying Exam, November 2008

PAPERS IN PREPARATION

Varun Khare and Beichuan Zhang. “Towards Economically Viable Overlay Multicast Networks”. (submitted to Computer Networks Journal)

Cheng Yi, Alexander Afanasyev, Varun Khare, Lan Wang, Beichuan Zhang and Lixia Zhang. “Robust Packet Delivery via Named Data”. (in-progress)

Varun Khare and Beichuan Zhang. “CDN Request Routing to Reduce Network Access Cost”. (submitted to INFOCOM’ 11)

Varun Khare and Beichuan Zhang. “Large Route Leaks: Detection and Characterization”. (submitted to INFOCOM’ 11)

HONORS AND AWARDS

Travel Grant Award, ICDCS’ 11, Minneapolis, Minnesota, June 2011

Student Travel Grant Award, SIGCOMM’ 09, Barcelona, Spain, August 2009

Graduate Research Assistantship (GRA) for MS and Ph.D. in Computer Science 2007-2011

Graduate Tuition Scholarship (GTS) for MS in Computer Science 2005-2006

Dean’s List in School of Science, Engineering and Technology
St. Mary’s University, San Antonio, Texas

Awarded Dean’s Highest Honor List for Fall’ 02 and Spring’ 04, Dean’s Honor List for Fall’ 01 and Fall’ 03 and Dean’s List for Spring’ 03.

Recipient of the **President’s Scholarship**, St. Mary’s University for 8 consecutive semesters

Recipient of the **Dean’s Scholarship**, St. Mary’s University for 7 semesters

Recipient of the **Richter Math Scholarship**, St. Mary’s University for 2 semesters.

Recipient of the **Alumni Scholarship**, St. Mary’s University for the last 6 semesters

Recipient of the **Treadaway Scholarship**, St. Mary’s University for the last 6 semesters

COMPUTER SKILLS

- Languages: C, C++, C# and Java
- Scripting: Perl and Bash
- Internet Protocols: OSPF, IPv4, IPv6, IGMPv3, PIM-SM, PIM-DM, TCP, UDP, BGP, RIP, RPC, RTP, DNS, HTTP

- Databases: MySQL and SQL Server 05
- Web Technologies: XML, XPath, XQuery and HTML
- Operating Systems: Unix, Linux (Fedora, Ubuntu), OS X and Windows XP.

REFERENCES

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