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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

PATENT: 6,928,442

INVENTOR: DAVID A. FARBER
AND RONALD D. LACHMAN

FILED: Nov. 15, 2001

ISSUED: Aug. 9, 2005

TITLE: ENFORCEMENT AND
POLICING OF LICENSE CONTENT
USING CONTENT-BASED
IDENTIFIERS

DECLARATION OF NARASHIMHA REDDY

1. I, Narashimha Reddy, declare as follows:
2. I have been asked by Petitioner to provide this Declaration regarding certain factual issues that are common to multiple Inter Partes Review proceedings.

I. Background

3. My name is A. L. Narashimha Reddy. I am currently the J.W. Runyon Professor of Electrical and Computer Engineering at Texas A&M University in College Station, Texas. I have over 25 years of experience in a wide variety of technologies and industries relating to data storage and retrieval.

4. I was a graduate student at the University of Illinois, Urbana-Champaign during August 1985–August 1990 and I was a Research Staff Member at IBM Almaden Research Center during August 1990–August 1995. I joined Texas A&M University as a faculty member in August 1995. I have been using Usenet newsgroups from 1985 onwards. Usenet newsgroups provided an easy mechanism to share information and learn from others.

5. Usenet newsgroups are organized based on various topics related to computer technology, social issues, and any other topic that people would like to discuss with others. I used to subscribe to several computer-related newsgroups and some social newsgroups. Until the World Wide Web became popular, newsgroups were one of the fastest ways to disseminate information to others. People with similar interests gather and post articles on different topics in different newsgroups.

6. A complete curriculum vitae, including a list of my publications, is attached hereto as Appendix B.

7. The testimony I provide in this Declaration is based on my personal knowledge of the relevant facts. A list of the materials that I reviewed in preparation for this Declaration is attached hereto as Appendix A. In addition, I reviewed each of the materials cited or referred to in this Declaration, even if not listed in Appendix A.

II. The LANGER Reference

8. I have been asked to provide my understanding of certain facts relating to the following document:

- Albert Langer, “Re: dl/describe (File descriptions),” article [<1991Aug7.225159.786@newshost.anu.edu.au>](mailto:1991Aug7.225159.786@newshost.anu.edu.au) in Usenet newsgroups “alt.sources.d” and “comp.archives.admin” (August 7, 1991) (the “Langer Reference,” RACK-1007).

9. I obtained a copy of the Langer Reference (RACK-1007) from the “Google Groups” website, at the web address <https://groups.google.com/>. Google Groups contains a compilation of Usenet articles going back to the 1980s and is recognized as a key archive of Usenet articles. For example, running a Google

Groups search on the term “albert langer unique identifier” returns the Langer Reference as one of the top results.

10. As explained more fully below, it is my belief that the Langer Reference was publicly accessible on or about August 7, 1991.

11. The Langer Reference is a Usenet article dated August 7, 1991. I have been familiar with Usenet since 1985 and more specifically, I was familiar with Usenet during the 1991–1992 time frame. Usenet was a worldwide system that facilitated discussion of various topics. Usenet was built on top of interconnected “news servers”. Clients connect to news servers to get access to articles posted on Usenet. A user could send and receive articles from their own computers. These computers connect to news servers that distribute articles to other news servers across the world. Articles were grouped into “newsgroups,” with each newsgroup covering a specific topic (both technical and non-technical). Usenet nodes automatically communicated among themselves to propagate articles to the entire network, which included many thousands of nodes worldwide. Users subscribed to different newsgroups and any new postings on those newsgroups are delivered to the subscribing users. Users can comment and reply to earlier articles, and the articles are threaded into different topics, much like e-mail systems do now.

12. During the 1991–1992 time frame, I subscribed to several newsgroups in technical areas close to my research interests (e.g., computer networking, storage systems, computer architecture, and others). I regularly read articles from those newsgroups. Many of those newsgroups and articles were in the same technical field as the Langer Reference, namely, the management and distributed storage of data. I relied on Usenet as a significant and timely source of information to follow development in different technical fields. In that time frame, researchers regularly wrote Usenet articles to disseminate new ideas and to comment on others' articles. Because the Usenet community was heavily concentrated around computer science departments, Usenet was a natural forum to discuss topics such as computer systems and networking.

13. It is my belief that the Langer Reference is a true and correct copy of the document that Petitioner claims it is. Like all Usenet articles, the Langer Reference includes several "header fields" that provide essential information about the document. Each of those header fields has the format and content one would expect of an authentic Usenet article from the 1991 time frame. For example, the "From:" field identifies the article's author (Albert Langer). The "Newsgroups:" field indicates that the article was posted to two newsgroups: "alt.sources.d" and "comp.archives.admin." These newsgroups are listed in the well-known syntax

one would expect. The "Subject:" field indicates the subject matter of the article, namely, a computer program relating to "File descriptions" that was posted to the "alt.sources" newsgroup. The "Message-ID:" field includes a unique identifier for the article. The "Date:" field indicates that the article was posted on August 7, 1991 at approximately 10:52 p.m. GMT, which would have been automatically generated when the article was posted to Usenet. The simple, plain-text formatting and the use of email-like visual conventions (e.g., lines beginning with ">" to quote another article) are also consistent with the format of Usenet articles from the 1991 time frame. While a Usenet article has some similarities to an e-mail, it also has distinctive characteristics which identify it as a Usenet article. The presence of the "Newsgroups:", "References:", "Followup-To:", "Organization:", and "Lines:" fields all would have been normal for a Usenet article but unusual in e-mail. The address that appears in the "Sender:" field shows that this post originated from the newshost machine in Australian National University. In addition, this article was posted by Albert Langer as a reply to an earlier article, as noted by "Re:" in the subject header. Finally, the "Path:" header field contains the particular list of Usenet nodes that the article traversed until it reached the point where it was archived. I am confident that the Langer Reference (RACK-1007)

was published to Usenet on the approximate date and time indicated and that the header and contents of the article in RACK-1007 are as originally posted.

14. It is also my belief that the Langer Reference was publicly accessible prior to April 11, 1994. During the 1991–1992 time frame, Usenet was one of the preeminent Internet-based sources of information in a variety of technical fields. During that time, Usenet was widely available to University faculty, students, and staff, as well as to research and development employees of several commercial institutions that had Internet access. In addition, in the same time frame, access to Usenet via a telephone modem was commercially available to anyone for a fee (and the cost of network access or telephone service). *See* G. Todino et al., *Using UUCP and Usenet* (1991), at 100-101 (RACK-1015). I had access to Usenet as a graduate student at University of Illinois, Urbana-Champaign, while I was working in the industry at IBM, and as a faculty member at Texas A&M University. When I obtained the Langer Reference from Google Groups, I noticed that people read and commented on Langer's article in 1991.

15. Each newsgroup in Usenet was devoted to a specific topic. Thus, the readership of each newsgroup generally consisted of individuals with a specific interest in that topic. In addition, an article could be posted to multiple newsgroups, thus multiplying its readership. For example, the Langer Reference

was posted to two newsgroups: “alt.sources.d,” which hosted technical discussions about source code posted to the “alt.sources” newsgroup, and “comp.archives.admin,” which focused on technical issues relating to the administration of computer archives.

16. During the 1991–1992 time frame, total Usenet readership already numbered in the millions. For example, a contemporaneous article provides an estimate of about 1.7 million “netreaders” in August 1991. B. Reid, “USENET READERSHIP SUMMARY REPORT FOR AUG 91” (Sept. 1, 1991) (the “Reid Summary,” RACK-1012). The readership for the “alt.sources.d” and “comp.archives.admin” newsgroups was also large, numbering 37,000 users and 27,000 users, respectively. B. Reid, “USENET Readership report for Aug 91” (Sept. 1, 1991) (the “Reid Report,” RACK-1013). These figures are consistent with my personal recollection of the facts at the time. Note that, by default, the Langer Reference was propagated to the entire Usenet network since it does not include any of the indicia (e.g., a “Distribution:” field) that would specify that the intended recipients were limited to a specific geographical area or set of nodes. Whether to accept or retain articles from any particular newsgroup was a policy that was settable on a per-node and per newsgroup basis. However, the vast majority of Usenet sites accepted articles from any newsgroup with a name

beginning with “comp.”, as these were considered to be valuable resources of information. Also, the program that generated the statistics used to produce the above-mentioned readership reports actually examined each user’s records of which groups and articles had been read, so the readership statistics of each newsgroup reflect both node policy and actual readership. Each Usenet article was thus publicly available to a large audience of persons interested in the subject matter. Specifically, it is my assessment that the Langer Reference was delivered to at least tens of thousands of users who had a specific technical interest in the administration of computer archives, based on the estimate from the Reid Report. *See* RACK-1013. Also, the Reid Summary provides a small sample of the Usenet nodes during that time frame, indicating the geographic, academic, and industry reach of Usenet at that time. *See* RACK-1012.

17. The intended audience received each of the Usenet articles within at most a day or two from the date on which it was posted. Since Usenet articles were small plain-text files, propagation to the entire Usenet network was rather fast, despite the low network speeds of the time. In fact, according to a contemporaneous source, more than 90% of all messages reached 90% of all nodes for which they were intended within one day. J.S. Quarterman, *The Matrix* (1990), at 237 (RACK-1014). This is consistent with my personal recollection of the facts

at the time. Consequently, Usenet articles in general, and the Langer Reference in particular, were automatically pushed and distributed to a set of users who had registered interest in the relevant topics (e.g., administration of computer archives).

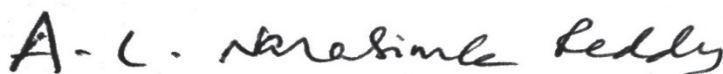
18. Each of the individuals who received one of the Usenet articles had the opportunity to read it on their computer screen and/or save it to disk for future reference. That functionality was available through standard programs such as “rn” (for “read news”) with which I was familiar during the 1991–1992 time frame. *See* RACK-1015, at 116–21. A system administrator could archive entire newsgroups similar to a user saving an article, and it is my understanding that the copies of the Langer Reference in existence today are the result of such archival.

III. Conclusion

19. In signing this declaration, I recognize that the declaration will be filed as evidence in a contested case before the Patent Trial and Appeal Board of the United States Patent and Trademark Office. I also recognize that I may be subject to cross examination in the case and that cross examination will take place within the United States. If cross examination is required of me, I will appear for cross examination within the United States during the time allotted for cross examination.

20. I declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code.

Executed on this 8th day of October, 2013.

A handwritten signature in black ink, reading "A. C. Narashimha Reddy". The signature is written in a cursive style with a horizontal line underneath.

Narashimha Reddy
College Station, Texas

APPENDIX A: LIST OF MATERIALS REVIEWED

Exhibit	Description
RACK-1007	Albert Langer, “Re: dl/describe (File descriptions),” article < 1991Aug7.225159.786@newshost.anu.edu.au > in Usenet newsgroups “alt.sources.d” and “comp.archives.admin” (August 7, 1991)
RACK-1012	B. Reid, “USENET READERSHIP SUMMARY REPORT FOR AUG 91” (Sept. 1, 1991)
RACK-1013	B. Reid, “USENET Readership report for Aug 91” (Sept. 1, 1991)
RACK-1014	J.S. Quarterman, The Matrix (1990)
RACK-1015	G. Todino et al., Using UUCP and Usenet (1991)

APPENDIX B: NARASHIMHA REDDY'S CURRICULUM VITAE

A. L. NARASIMHA REDDY
Dept. of Elec. & Comp. Engg.
Texas A & M University
333J Wisenbaker, College Station, TX 77843-3259
<http://www.ece.tamu.edu/~reddy>
reddy@ece.tamu.edu, 979-845-7598 (O), 979-845-2630 (FAX)

Educational Record:

University of Illinois (Urbana) : Ph.D. in Electrical and Computer Engineering. Aug. 1990.

University of Illinois (Urbana) : M.S. in Electrical and Computer Engineering. May 1987.

Indian Institute of Technology (Kharagpur, India): Bachelor of Technology (Honors) in Electronics and Electrical Communication Engineering. May 1985.

Thesis Topic:

Ph.D Thesis : Issues in IO architectures for high-performance/multiprocessor systems.

M.S. Thesis: Algorithm based Fault Detection Techniques for Specific Applications.

B.Tech Thesis (Project) : Studies on Residue Number System for Signal Processing.

Honors and Awards:

Cited for one of the most influential papers of first ACM Multimedia Conference.

Distinguished Achievement Award for teaching (College level), AFS, TAMU, 2005.

Ford Fellow, College of Engg., TAMU 2004.

Outstanding Professor Award, Dept. of EE, TAMU, 2003-04.

TEES Fellow, College of Engg., TAMU, 2001.

Neely Faculty Fellow, College of Engg., TAMU, 1999.

Outstanding Professor Award, IEEE Student branch, TAMU, 1997-1998.

NSF Career Award (1996-2000).

5 Patents and an IBM Plateau Invention Achievement Award.

IBM Graduate Fellowship (1988-90).

Presidential Silver Medal, Indian Institute of Technology, Kharagpur, India
(May 86).

Research Interests:

Storage Systems, Networks, Multimedia, and Computer Architecture.

Work Experience:

Catedra de Excelencia, University of Carlos III, Madrid, Spain, Aug. 2009-
Feb. 2010.

J.W. Runyon Professor, Dept. of ECE., Texas A&M University, Oct. 2008-
Present.

Professor, Dept. of Elec. and Compu. Engg, Texas A & M University, Sep.
2004 -Sep. 2008.

Associate Professor, Dept. of Elec. Engg, Texas A & M University, Aug.
1995 - Aug. 2004.

Research Staff Member, IBM Almaden Research Center: Aug. 1990 - Aug.
1995.

Professional Activities:

External Evaluator, Faculty Promotion Committee, University of Jordan, Amman, Jordan, 2012.

Program Committee Member, Parallel Data Storage Workshop, 2012.

Member, Information Technology Research Academy Strategy Formulation, India, Oct. 2011.

Review Chair, Los Alamos National Lab Research Information Institute program, Apr. 2011.

Program Committee Member, USENIX HotStorage Conf., 2010-2012.

External Evaluator, Faculty Search Committee, ICS-FORTH, Crete, Greece, 2009.

Program Co-chair, IEEE Broadnets 2008.

Area Lead, IEEE Infocom 2008.

Program Committee Member, USENIX FAST Conf. 2009.

Panels Co-Chair, COMSWARE 2008.

Program Committee Member, ICDCS 2008, 2013.

Program Committee Member, IEEE ICNP 2008.

Program Committee Member, COMSNETS 2009-2013.

Program Committee Member, COMSWARE 2007-2008.

Program Committee Member, Int. Workshop Visualization for Computer Security, 2006.

Program Committee Member, CoNEXT Conference, 2006, 2007, 2009.

Program Committee Member, Int. Workshop on QOS, 2006-2011.

Program Committee Member, IEEE Infocom, 2005-2013.

External Reviewer, Faculty promotion Committee, KAIST, Korea, 2003.

Technical Consultant, EMC Corp., 2001-2003.

Educational Content Expert on Computer Networking, Jones International University.

Member, Technical Advisory Board, Netgeo Inc., Mountain View.

Technical Advisor, TBD Networks.

NSF Panelist, several times, 1999-2013.

Proposal Reviewer, Netherlands NSF.

Program Committee member, ACM Multimedia Conference, 2002.

Program Committee member, MCW-2001, Multimedia on Clusters of Workstations, 2001.

Program Committee member, IEEE Int. Conf. on Multimedia Comp. and Systems, 1999.

Panel Chair, IEEE Conf. High Performance Computer Architecture, 1999.

Program Committee member, High Performance Computing, 1999.

Program Committee member, Int. Conf. on Parallel Processing, 1998.

Tutorial Chair, IEEE Conf. on Multimedia Computing Systems, 1998.

Panel Chair, Int. Conf. on Parallel Processing, 1995.

Program Committee member, Int. Conf. on Parallel Processing, 1995.

Program track coordinator, Hawaii Int. Conf. on Systems and Sciences, 1994.

Reviewer for several conferences, journals and NSF.

Fellow of the IEEE Computer Society, member of ACM SIGARCH.

Patents

- N. Annapareddy, J. Brady, D. Finney, M. Hartung, M. Ko, J. Menon, and D. Nowlen, Conflict resolution in multi-node communication network, U.S. Patent number: 6,101,194, received Aug. 8, 2000.
- N. Annapareddy, J. Brady, D. Finney, R. Freitas, M. Ko, and M. Rayfield, Method and System for message status reporting in a multi-node communication network, U.S. Patent number: 5,717,862, received Feb. 10, 1998.
- N. Annapareddy, D. Finney, M. Jenkins, L. Kessler, A. Lang, S. Liang, D. Mora, D. Plomgren, P. Urbisci and A. Walls, Interconnection network for a multi-nodal data processing system which exhibits incremental scalability, US Patent number: 5,602,044, received Feb. 11, 1997.
- N. Annapareddy, J. Brady and D. Finney, Adaptive and Dynamic message routing system for multinode wormhole networks, US Patent number: 5,602,839, Received Feb. 11, 1997.
- N. Annapareddy, J. Brady, D. Finney, R. Freitas, M. Hartung, M. Ko, N. Mendelson, J. Menon, D. Nowlen and S-Y Tzou, System and method using chaines structured queues for ordering of message delivery between connected nodes wherein unsuccessful message portion is skipped and retried, US Patent number: 5,577,211, Received Nov. 19, 1996.

Archival Publications

- Wu, X¹, Qiu, S.¹, and Reddy A. L. N., “SCMFS: A file system for Stroage Class Memory and its extensions”, accepted for publication in ACM Transactions on Storage, Jan. 2013.
- Wu, X1 and Reddy A. L. N., “A novel approach to manage hybrid storage system”, Journal of communications, vol.7., July 2012.
- Shin, S., Gu, G., Reddy, A. L. N., “A large-scale study of Conficker”, IEEE Trans. Information Forensics and Security, June 2012.
- Yadav, S¹, Reddy, A. K.¹, Reddy, A. L. Narasimha and Ranjan, S., “Detecting algorithmically generated malicious domain names”, ACM/IEEE Trans. on Networking, 2012.

- Lee, Y-O.¹ and Reddy, A. L. Narasimha, “Algorithms for disjoint path construction for failure recovery and multipath routing”, to appear in Journal on Computer Networks, 2012.
- Garrison, J.¹, and Reddy, A. L. Narasimha, “Umbrella File System: Storage management across heterogeneous devices”, ACM Transactions on Storage, vol.5, no.1, Mar. 2009.
- Kim, S.¹, and Reddy, A. L. Narasimha, “Statistical Techniques for detecting Traffic Anomalies through Packet header data” IEEE/ACM Transactions on Networking (ToN), July 2008.
- Liu, Y.¹, and Reddy, A. L. N., ”Multihoming route control among a group of multihomed stub networks”, Journal on Computer Communications, Nov. 2007.
- Bhandarkar, S.¹, Reddy, A. L. N., Allman, M., Blanton, E., ”Improving the robustness of TCP to non-congestion events”, IETF(Internet Engineering Task Force) RFC 4653, August 2006.
- Kang, S¹., Reddy, A. L. N., “An Approach to Virtual Allocation in Storage Systems”, in ACM Transactions on Storage, Nov. 2006, Vol.2, pages:371-399.
- Kim, S1., Reddy, A. L. N., “Image based Anomaly detection: Design, Algorithms and Evaluation”, IEEE Journal on Selected Areas of Comm., vol. 24.10, October 2006, 1942-1954.
- Bhandarkar, S.1, Reddy A. L. N., “LTCP: A layered framework for improving TCP’s performance in high-speed networks”, in ACM CCR, Jan. 2006.
- Kwon, D.W., Ko, M., Vannucci, M., Reddy, A. L. N., and Kim, S.1, “Wavelet methods for the detection of anomalies and their application to network traffic analysis”, Quality and Reliability Engineering International (QREI) 2006, 22, pages: 1-17.
- Reddy, A. L. N., Wyllie, J., and Wijayarathne, R.1, “Scheduling for multimedia servers”, invited submission for the premier issue of ACM Transactions on Multimedia, March 2005. Cited for being one of the most influential papers from ACM Multimedia conference 1993.

- Kim, S1., and Reddy, A. L. N., “Statistical techniques for detecting traffic anomalies through packet header data”, accepted for publication in ACM/IEEE transactions on Networking, January 2007.
- Garg, A1., and Reddy, A. L. N., “Mitigating Denial of service attacks through QOS regulation”, in the special issue of Journal of Microprocessors and Microsystems on secure platforms, May 2004.
- Bhandarkar, S.1, Sadry, N.1, Reddy A. L. N., Vaidya, N., “TCP-DCR: A novel protocol for tolerating wireless channel errors”, IEEE Transactions on Mobile Computing, March 2005.
- Zhao, Z.1, Ametha. J., Swaroop. D. and Reddy A. L. N., “A method for estimating nonresponsive traffic at a router”, ACM/IEEE Trans. on Networking, Aug. 2004.
- Yeom, I1. and Reddy A. L. N., “Adaptive Marking for Assured Forwarding Service” IEEE Communication Letters, Oct. 2002.
- Yeom, I1. and Reddy A. L. N., “Providing consistent delay differentiation” accepted by IEICE Transactions on Communications, Sept. 2002.
- Ma, X1. and Reddy A. L. N., “Multiview Storage Systems”, IEEE Trans. on Parallel and Distributed Systems, Apr. 2003.
- Yeom, I1. and Reddy A. L. N., “Marking for QOS Improvement”, Elsevier Journal of Computer Communications, pages 35-50, vol. 24, no.1, Jan 2001.
- Yeom, I1. and Reddy, A. L. N., “Modeling TCP behavior in a differentiated services network”, ACM/IEEE Transactions on Networking, vol. 9, no.1, pages 31-46, Feb. 2001.
- Ma, G.1, Khaleel, A1. and Reddy, A. L. N., “Evaluation of storage systems based on network-attached disks”, IEEE Transactions on Parallel and Distributed Systems, September 2000, 956-968.
- Wijayarathne, R1. and Reddy, A. L. N., “Providing QOS guarantees for disk I/O”, Proc. of ACM/Springer Journal on Multimedia Systems, Jan 2000, vol.8, no.1, pages:57-68.
- Yeom, I1. and Reddy, A. L. N., “ENDE: An End-to-end Network Delay Emulator”, Journal on Multimedia Tools and Applications, Kluwer Publishers, vol. 14, no.3, June 2001.

- Reddy, A. L. N. and Upfal, E., “Real-time communication scheduling in a multicomputer video server”, Journal on Parallel and Distributed Computing, Sep. 1999, vol.58, pages: 425-445.
- Reddy, A. L. N. and Wyllie, J., “I/O issues in a multimedia system”, IEEE Computer, Mar. 1994, vol.27, no.3, pages:69-74.
- Reddy, A. L. N., Chandy, J. and Banerjee, P., “Design and evaluation of gracefully degradable disk arrays”, Journal of Parallel and Distributed Computing, Jan. 1993, vol.17, pages: 28-40.
- Reddy, A. L. N. and Banerjee, P., “Algorithm Based Fault Detection Techniques for Signal Processing Applications”, IEEE Transactions on Computers, Oct. 1990, vol.39, no.10, pages: 1304-1308.
- Reddy, A. L. N. and Banerjee, P., “Design, Analysis and Simulation of IO Architectures for Hypercube Multiprocessors” IEEE Transactions on Parallel and Distributed Systems, April 1990, vol.1, no.2, pages:140-151.
- Reddy, A. L. N. and Banerjee, P., “An evaluation of multiple-disk IO systems” IEEE Transactions on Computers, Dec. 1989, vol. 38, no.12, pages:1680-1690.
- Reddy, A. L. N. and Banerjee, P., “A Study of Parallel Disk Organizations” ACM Computer Architecture News, Sept. 1989.
- Abraham, J., Banerjee, P., Chen, C.Y., Fuchs, W.K., Kuo, S. Y. and Reddy, A.L.N., “Fault Tolerance Techniques for Systolic Arrays”, IEEE Computer, July 1987, vol.20, no.7, pages:65- 85.
- Chakraborti, N.B., Soundararajan, J.S.and Reddy, A. L. N., “An Implementation of Mixed-Radix Conversion for Residue Number Applications”, IEEE Transactions on computers, August 1986, vol. C-35, no.8, pages:762-764.

Publication of books or book chapters

- Bhandarkar, S.1, and Reddy, A. L. N., “TCP in Wireless Networks”, invited book chapter in Encyclopedia on wireless and mobile communications”, CRC Press, Dec. 2007.
- I. Yeom1 and A. L. Narasimha Reddy, “Differentiated Services”, invited book chapter in Wiley’s Encyclopedia on Communications, 2002.

- A. L. Narasimha Reddy and J. Wyllie, “Disk Scheduling in a Multimedia I/O System”, reproduced as a book chapter in Readings in Multimedia Computing and Networking, Morgan Kaufmann Publishers, Editors: Kevin Jeffay and HongJiang Zhang, Summer 2001.
- Reddy, A. L. N. and Wijayarathne R., “Scheduling for integrated service in multimedia systems”, invited book chapter in Multimedia Handbook, CRC Press, Dec. 1997.
- Reddy, A. L. N. and Haskin R., “Video Servers”, invited book chapter in Communications Handbook, CRC Press, 1996.
- Reddy, A. L. N., “Improving the interactive responsiveness in a video server”, invited book chapter in Multimedia Information Storage and Management, Kluwer Academic Publishers, Dec. 1996.
- Reddy, A. L. N., “Scheduling in Multimedia Systems”, invited book chapter in Design and Applications of Multimedia Systems, Kluwer Academic Publishers, Aug. 1995.

Rigorously Refereed Conference Publications

- Moon, S1 and Reddy, A. L. Narasimha, “Don’t let RAID raid the lifetime of your SSD array”, Proc. of USENIX HotStorage Conf., June 2013.
- Qiu, S1, and Reddy, A. L. Narasimha, “NVMFS: A hybrid file system for improving random write in NAND-flash SSD”, Proc. of Mass Storage Systems Symposium, May 2013.
- Lee, Y-O1, and Reddy, A. L. Narasimha, “Multipath Routing for Reducing Network Energy”, IEEE Greencom Conf., Sep. 2012.
- Qui, S1., Reddy, A. L. Narasimha, “Exploiting superpages in a nonvolatile memory file systems”, IEEE Mass Storage Symposium, Apr. 2012.
- Moon, S1., Reddy, A. L. Narasimha, “Write amplification due to ECC on flash memory or leave those bit errors alone”, IEEE Mass Storage Symposium, Apr. 2012.
- Wu, X1., Reddy, A. L. Narasimha, “SCMFS: A file system for storage class memory”, ACM/IEEE Supercomputing Conf. SC11, Nov. 2011.
- Yadav S.1, Reddy, A. L. Narasimha, “Winning with DNS Failures: Strategies for faster botnet detection”, SecureComm Conf., Sep. 2011.

- Lee, Y-O1, Rengarajan, B., and Reddy, A. L. Narasimha, “Reaching approximate Wardrop equilibrium at reduced cost of link state updates” , COMSNETS Conf., Jan 2011.
- Qian,B1., and Reddy, A. L. Narasimha, “Measurement and performance study of PERT for on-demand video streaming” , Pfldnet workshop, Nov. 2010.
- Yadav, S1, Reddy, A. K.1, Reddy, A. L. Narasimha and Ranjan, S., “Detecting algorithmically generated malicious domain names”, Proc. of Internet Measurement Conference, Nov. 2010.
- Wu, X1., Reddy, A. L. Narasimha, “Exploiting concurrency to improve latency and throughput in a hybrid storage system”, Best Paper Nomination, IEEE MASCOTS Conf., Aug. 2010.
- Devakota, P1., Reddy, A. L. Narasimha, “Performance of Quantized Congestion Notification in TCP Incast Scenarios of Data centers”, IEEE MASCOTS Conf., Aug. 2010.
- Lee, Y-Oh1., Reddy, A. L. Narasimha, “Disjoint Multi-Path Routing and Failure Recovery”, Proc. of ICC, May 2010.
- Yadav, S1., Reddy, A. L. Narasimha, “DNS Anomaly detection with NS and AS information”, IASTED Conf. on Network Security, Nov. 2010.
- Wu, X1., Reddy, A. L. Narasimha, “Managing storage space in a flash and disk hybrid storage system ”, IEEE MASCOTS Conf., Oct. 2009.
- Podduturi, V., Kim, Y., Shakkottai, S., Reddy, A. L. Narasimha, “MultiTrack: A delay and cost aware P2P Overlay architecture”, ACM Sigmetrics, June 2009.
- Kotla, K1., Reddy, A. L. N., “Making a delay-based protocol adaptive to heterogeneous environments”, Proc. of IwQOS, June 2008.
- Kang, S1., Reddy, A. L. N., “User-centric data migration in networked storage systems”, Proc. of IPDPS, April 2008.
- Bhandarkar, S1., Reddy, A. L. N., Zhang, Y., Loguinov, D., “Emulation of AQM at end hosts”, Proc. ACM Sigcomm, Aug. 2007.
- Bhandarkar, S1., Reddy, A. L. N., “Robustness to packet reordering in high-speed networks”, Proc. of Pfldnet, Feb. 2007.

- Al-Najjar, C1., Reddy, A. L. N., “A service provider’s approach to improving performance of aggregate voice-over-IP traffic”, Proc. of IWQOS, June 2006.
- Kim, S1., Reddy, A. L. N., “Netviewer: A Network traffic visualization and analysis tool”, Proc. of USENIX LISA Conference, Dec. 2005, 185-196.
- Liu, Y1, and Reddy A. L. N., “Routing among a group of multi-homed stub networks”, Proc. of Globecom, Dec. 2005.
- Bhandarkar, S1., Reddy, A. L. N., “LTCP: A layered approach to TCP for high-speed networks”, PFLDNet, Feb. 2005.
- Kim, S1., Reddy, A. L. N., “Modeling network traffic as images”, ICC, May 2005.
- Kim, S1., Reddy, A. L. N., “A study of analyzing network traffic as images in real-time”, IEEE Infocom, March 2005.
- Kim, S1., Reddy, A. L. N., “Real-time detection and containment of network attacks using QOS regulation”, Proc. of ICC, May 2005.
- Kang, S1., Reddy, A. L. N., “Virtual Allocation: A scheme for flexible storage allocation” OASIS workshop at ASPLOS, Oct. 2004.
- Liu, Y1, and Reddy A. L. N., “A fast rerouting scheme for OSPF/IS-IS networks”, Proc. of ICCCN, Oct. 2004.
- Achanta, P.1, and Reddy A. L. N., “LRU-FQ: Design and Evaluation of a Partial State Router”, Proc. of ICC 2004, June 2004.
- Zhao, Z1., Reddy, A. L. N., “Impact of bandwidth-delay product and non-responsive flows on queue management schemes”, Proc. of ICC 2004, June 2004.
- Bhandarkar, S1., Reddy, A. L. N., “TCP-DCR: Making TCP robust to non-congestion events”, Proc. of Networking 2004, May 2004.
- Kim, S¹., Reddy, A. L. N., and Vannucci, M., “Detecting traffic anomalies at source through aggregate analysis of packet header data”, Proc. of Networking 2004, May 2004.
- Kim, S1., Reddy, A. L. N., and Vannucci, M., “Detecting traffic anomalies using discrete wavelet transform”, Proc. of Int. Conf. on Information Networking, Feb. 2004.

- Ma, X1., and Reddy, A. L. N., “SPIRAL: A novel third party transfer scheme for network attached devices”, IEEE Mass Storage Symposium, April 2003.
- Zhao, Z1., Ametha, J., Swaroop, D. and Reddy A. L. N., “A method for estimating nonresponsive traffic at a router”, ACM Conf. on Sigmetrics, June 2002.
- Garg, A1., and Reddy, A. L. N., “Mitigating Denial of service attacks through QOS regulation”, IwQoS workshop, May 2002.
- Wijayarathne, R1. and Reddy, A. L. N., “System support for providing integrated services from networked multimedia storage servers”, ACM Conf. on Multimedia, October 2001, 270-279.
- Smitha1 and Reddy, A. L. N., “LRU-RED: An active queue management scheme to contain high bandwidth flows at a congested router”, in IEEE Globecom Conference, Nov. 2001.
- Smitha1, Kim, I1., and Reddy, A. L. N., “Identifying long term high rate flows at a router”, in Proc. of High Performance Computing, Dec. 2001.
- Yeom, I1., and Reddy, A. L. N., “Adaptive marking for aggregated flows”, in Proc. of IEEE Globecom, Nov. 2001.
- Gopalakrishnan, S1. and Reddy, A. L. N., “SACRIO: An active buffer management scheme for Differentiated Service Networks”, Proc. of NOSSDAV, June 2001.
- Ma, X1. and Reddy, A. L. N., “MVSS: MultiView Storage Systems”, Proc. of Int. Conf. on Distributed Computer Systems (ICDCS), Apr. 2001.
- Khaleel, A1. and Reddy, A. L. N., “Evaluation of Request and data distribution policies in a clustered server”, Proc. of High Performance Computing, Dec. 1999.
- Yeom, I1. and Reddy, A. L. N., “Realizing throughput guarantees in a differentiated services network”, Proc. of IEEE Int. Conf. on Multimedia Computing and Systems, June 1999.
- Wijayarathne, R1., Reddy, A. L. N., “Integrated QOS management for disk I/O”, Proc. of IEEE Int. Conf. on Multimedia Computing and Systems, June 1999.

- Yeom, Il. and Reddy, A. L. N., “Impact of marking strategy on aggregated flows in a differentiated-services network”, Proc. of IEEE International Workshop on QOS (IwQOS 99), June 1999.
- Tong, D1. and Reddy, A. L. N., “QOS Enhancement with Partial Sate”, Proc. of IEEE International Workshop on QOS (IwQOS 99), June 1999.
- Gupta, S1. and Reddy, A. L. N., “IPRP: A Client-oriented IP Redirection mechanism”, Proc. of IEEE Infocom Conf., March 1999.
- Wijayarathne, R1. and Reddy, A. L. N., “Techniques for improving the throughput of VBR streams”, Proc. of ACM/SPIE Multimedia Computing and Networking, Jan. 1999.
- Ma, G1. and Reddy, A. L. N., “An evaluation of storage systems based on network-attached disks”, Proc. of ICPP Conf., Aug. 1998.
- Reddy, A. L. N., “Effectiveness of caching policies for a web server”, Proc. of High Performance Computing, Dec. 1997.
- Reddy, A.L.N., “Caching strategies for a multimedia server”, Proc. of IEEE Int. conf. on Multimedia Computing and Systems, June 1997.
- Reddy, A. L. N., “Improving Latency in an Interactive Video server”, Proc. of SPIE conf. on Multimedia Computing and Networking, Feb. 1997.
- Reddy, A.L.N., “Movie and communication scheduling on a multiprocessor video server system”, Proc. of IEEE Int. Conf. on Multimedia Comput. and Systems, May. 1995.
- Reddy, A.L.N., Wyllie, J., “Disk Scheduling in a Multimedia I/O System”, Proc. of 1st ACM Conf. on Multimedia, Aug. 1993. Included as a chapter in “A guided tour of multimedia systems and applications”, IEEE Press, 1995. Translated into Japanese by Nikkei Electronics, a Japanese technical magazine. To be included as ”one of the most influential papers” in ACM Transactions on Multimedia, Applications and Communications.
- Chandu, J., and Reddy, A.L.N., “ Failure evaluation of disk array organizations”, Proc. of Int. Conf. on Distributed Computing Systems, May 1993.

- Reddy, A.L.N. and Freitas, R., “Fault-tolerance of adaptive routing algorithms in multicomputer”, Proc. of 4th IEEE Symp. on Parallel and Distributed Processing, Dec. 1992.
- Reddy, A.L.N., “A Study of IO System Organizations”, Proc. of ACM Int. Symp. on Computer Architecture, May 1992.
- Reddy, A.L.N., “Reads and Writes: When IOs aren’t the same”, Proc. of Hawaii Int. Symp. on Systems and Sciences, Jan. 1992.
- Reddy, A.L.N., Banerjee, P. and Chen, D.K., “Compiler Support for Parallel I/O Operations”, Proc. of Int. Conf. on Parallel Processing, Aug. 1991.
- Reddy, A. L. N. and Banerjee, P., “Gracefully Degradable Disk Arrays”, Proc. of Int. Symp. on Fault Tolerant Computer Systems, June 1991.
- Reddy, A. L. N. and Banerjee, P., “A Study of IO Behavior of Scientific Applications on A Multiprocessor”, Proc. of ACM Int. Symp. on Computer Architecture, June 1990
- Reddy, A. L. N. and Banerjee, P., “Performance evaluation of multiple-disk IO systems”, Proc. of Int. Conf. on Parallel Processing, Aug. 1989.
- Reddy, A. L. N. and Banerjee, P., “IO issues in hypercubes”, Proc. of ACM Int. Conf. on Supercomputing, June 1989.
- Reddy, A. L. N., Banerjee, P. and Abrham, S.G., “IO embedding in Hypercubes”, Proc. of Int. Conf. on Parallel Processing, August 1988.
- Reddy, A. L. N. and Banerjee, P., “A Fault-Secure Dictionary Machine”, Proc. of 3rd International Conference on Data Engineering, Feb. 1987.

Other Publications

- Singh, A.1, and Reddy, A. L. Narasimha, “Multi path PERT”, Invited Paper at Int. Conf. on Computer Communications and Networks, July 2013.
- Amaleswaram, A.1, Reddy, A. L. N., Yadav, S.1, Gu. G., Yang, C., “CATS: Characterizing Automation of Twitter Spammers”, Invited Paper at Int. COMSNETS conf., Jan. 2013.
- Wu, X.1, and Reddy, A. L. N., “Data organization in a hybrid storage system”, Invited Paper at Int. Conf. on Computing, Networking and Communications, ICNC’12, Feb. 2012.

- Yin, Z.1, Hasari, C., Al-Nuweiri, H., and Reddy, A. L.N., “Improving the Performance of Delay Based Protocol in Delivering Real Time Media via Early Retransmission”, IEEE ICT Conf., Apr. 2011.
- Yin, Z.1, Al-Nuweiri, H., and Reddy, A. L.N., “Performance of Early retransmission scheme in streaming media”, IEEE ICT Conf., Apr. 2010.
- Kim, S1., and Reddy, A. L. N., “An evaluation of the effectiveness of measurement-based anomaly detection techniques”, ADSN workshop, held in conjunction with ICDCS, June 2006.
- Vellanki, S1., and Reddy, A. L. N., “Improving service availability during link failure transients through alternate routing”, Tech. Report, Texas A & M University, Feb. 2003.
- Ma, X1., and Reddy, A. L. N., “Implementation and Evaluation of an active storage system prototype”, Workshop on novel uses of System Area Networks, Feb. 2002.
- Reddy, A.L.N., “An evaluation of multiprocessor video server system”, IBM Confidential report, June 1994.
- Menon, J., Reddy, A.L.N., Treiber, K. and Tzou, S.Y., “Daisy: A Novel Heirachical Storage Management System, Functional Specification”, IBM Confidential Report, 77 pages, Jan 1994.

Recent Presentations:

- Invited talk at Georgia Tech., May 2013.
- Keynote talk at Int. Conf. on Information Technology: New Generations, Las Vegas, April 2013.
- Invited talk at COMSNETS Conf., Bangalore, India, Jan. 2013.
- Invited talk at Int. Conf. on Networking and Communications, Maui, Feb. 2012.
- Invited talk at NVRAMOS 2011, Jeju island, South Korea, Nov. 2011.
- Invited talks at Korea University, Ajou University, Samsung and ADD, Korea, Nov. 2011.
- Keynote talk at IEEE Int. Symp. on Computers and Communications, Italy, June 2010.
- Catedra Series talk at University of Carlos III, Dec. 2009, Madrid, Spain.

- Invited talk at Thomson Research, Paris, France, October 2009.
- Invited talk at Telefonica Research, Barcelona, Spain, September 2009.
- IBM Austin Research Lab Distinguished Seminar series, May 1 2008.
- Invited talk at University of Illinois, November 2006.
- Invited talk at Cisco, January 2005.
- Invited talk at University of Birmingham, UK, June 2004.
- Invited talk at Cisco Systems, San Jose, June 2002.
- Invited talk at Juniper Networks, Mountain View, June 2002.
- Invited talk at Univ. of California at Riverside, June 2002.
- Invited talk at Nortel Networks, Santa Clara, June 2000.
- Invited talk at Juniper Networks, Mountain View, June 2000.
- Talk at Internet Engineering Task Force, Washington D.C., Oct. 1999.
- Invited talk at EMC Corp., Boston, Aug. 1999.
- Tutorial on “Scheduling for Multimedia Applications”, presented at IEEE Int. Conf. on
Multimedia Computing and Systems, June 1999.
- Tutorial on High-Performance I/O at IEEE/ACM Int. Conf on Computer
Architecture, Atlanta,
May 1999.
- Invited talk at AT & T Research Center, Florham Park, March 1999.
- Invited talk at Bell Labs Research Center, Murray Hill, March 1999.
- Invited talk at EMC Corp., Boston, Nov. 1997.

Funding:

- “Exploiting social communication channels against cyber criminals”,
National Science Foundation, 2012-2015.
- “Client interfaces to object storage systems”, Argonne National Lab,
2012-2015.
- “Detecting malicious activities by analyzing social communication
contexts”, Qatar National Research Foundation, 2012-2015.

- “Network traffic analysis for botnet detection”, Narus Inc., Research gift, 2009-2010.
- “Design and Analysis of new generation of protocols for triple-play networks”, QNRF, Jan. 1. 2008 - Dec. 31 2010, Co-PI.
- “Dynamic allocation and data distribution in networked storage systems”, National Science Foundation, Oct. 2007 - Sept. 2010, sole PI.
- “Active Data Systems”, National Science Foundation, Sept. 2006 -Aug. 2009, sole PI.
- NSF REU grant, co-PI, 2004-2007.
- Network Elements based on partial state, Intel Corp., gift, Feb. 2003.
- Texas A & M University, “High Availability Infrastructure Laboratory”, TITF Award, Sept. 2002 - Dec. 2003, PI with R. Bettati, M. Vannucci and D. Swaroop.
- “Secure Networked Storage Systems”, National Science Foundation, Research Instrumentation grant, Sept. 2002- Sept. 2005.
- Texas Advanced Technology Program, “Network Architectures based on partial state”, Jan. 2001 - Dec. 2002.
- “Fellowships for Computer Engineering”, Department of Education, Aug. 2001- Aug. 2004, PI with R. Mercer and K. Watson.
- “QOS Enhancement with Partial state”, National Science Foundation, June 2001-June 2004, sole PI.
- “Multiview Storage Systems”, National Science Foundation, May 2001 - May 2004, sole PI.
- Equipment Donation, 3Ware Inc., Nov. 2000.
- “Scalable request-specific file service”, National Science Foundation, Aug. 1999 - Aug. 2002, sole PI.
- Research gift, EMC Corp., 1998.
- “Scalable Multimedia Storage Server”, Texas Higher Education Board, January 1996 - Dec. 1997, sole PI.
- “Scalable Storage Server for Multimedia and Scientific Applications”, National Science Foundation, 1996-2000, sole PI.

- “Development of Novel Systems Software for Multimedia and High-performance computing”, National Science Foundation, 1997-2000, PI along with R. Mercer, P. Cantrell, G. Choi and M. Lu.
- Equipment grant, Tandem Corporation, March 1997.
- Software donation, Microsoft Corporation, April 1997.

Teaching:

Redesigned the course ECEN 449 “Microprocessor Systems Design”, Fall 2007.

Developed a new course ELEN 627 “Multimedia Systems and Networks”.

Developed a freshman undergraduate course ENGR111 “Introduction to Electrical and Computer Engineering”.

Developing a new graduate course on “Network systems security”. Taught in Spring 2004, 2006.

Courses Taught: Undergraduate Introduction to Electrical and Computer Engineering, Undergraduate Computer Architecture, Graduate Network Systems security, Graduate Computer Architecture, Graduate Computer Networks, Graduate Multimedia Storage and Delivery, Graduate Parallel Computer Systems, Graduate I/O and Memory Systems.

Student Advising:

- Allen Webb, Ph.D. candidate, Jan. 2013-present, network security.
- Jagadeesh Dyaberi, Ph.D., Aug. 2011, “Networking and Storage support for on-demand video delivery”, Purdue University, External thesis committee member.
- Viacheslav Fedorov, Ph.D. candidate, 2010 - Present, Storage Architecture.
- Sangwhan Moon, Ph.D. candidate, 2010 - Present, Storage reliability.
- Sheng Qui, Ph.D. candidate, 2009 - Present, Storage Systems.
- Yong Oh Lee, Ph.D., May 2012, “Improving efficiency and effectiveness of multipath routing in computer networks”, later at Samsung.
- Sandeep Yadav, Ph.D., 2007 - 2012, “Scalable techniques for anomaly detection”, Dec. 2012, later at Dumballa.

- Xiaojin Wu, Ph.D., Flash and Disk Hybrid storage systems, Aug. 2011, later at Marvell Semiconductor.
- John Garrison, Ph.D., “Umbrella File System: Managing heterogeneous storage devices File systems”, Aug. 2009, later at DOD Labs, Tuscaloosa, Alabama.
- Sukwoo Kang, Ph.D., “Flexible space allocation and management in networked storage systems”, May 2007, later at IBM Almaden Research Center.
- Sumitha Bhandarkar, Ph.D., “Congestion control algorithms for TCP in emerging networks”, Aug. 2006, later at Motorola.
- Yong Liu, Ph.D., “Dynamic Routing protocols in multihomed networks”, Dec. 2006, later at EMC Corp.
- Seong Soo Kim, Ph.D., “Real-time analysis of aggregate network traffic”, May 2005, later at Samsung, Seoul, Korea.
- Zhili Zhao, Ph.D., May 2004, “Estimation and control of nonresponsive traffic”, later at Intel.
- Xiaonan Ma, Ph.D., Aug. 2003, “Augmenting functionality at storage systems”, later at IBM Almaden Research Center, San Jose.
- Ravi Wijayarathne, Ph.D., Dec. 2000, “PRISM: A file server architecture for providing integrated services”, later at Quantum, San Jose.
- Ikjun Yeom, Ph.D. student, Dec. 2000, “Bandwidth assurance in differentiated services networks”, later a faculty member at KAIST, South Korea.
- Bolun Huang, M.S. candidate, network security.
- Shyam Sambasivan, M.S. candidate, Storage Systems.
- Ankit Singh, M.S., “Multipath Probabilistic Early Response TCP”, Aug. 2012, later at Amazon.
- Cindy Cao, M.S., “SCMFS Performance Enhancement and Implementation on Mobile Platform”, Aug. 2012, later at Microsoft.
- Amit Anand, M.S., “Proactive spammer detection on Twitter”, Aug. 2012, later at Amazon.

- Bin Qian, M.S., Aug. 2011, “Evaluation of Probabilistic Early Response TCP (PERT) for video streaming and extension with ACK coalescing”, later at Amazon Data Services.
- Ashwath Reddy, M.S., Aug. 2010, Detecting networks employing algorithmically generated names, later at Microsoft.
- Prajjwal Devakota, M.S. Aug. 2010, Performance of Quantized Congestion Notification in TCP Incast in Data Centers, later at Bloomberg.
- Chaitanya Tadi, M.S., May 2009, IP Prefix Hijack Prevention Service, later at Intel.
- Marcus Dunn, M.S., May 2009, A new I/O scheduler for Solid State Devices, later at Cisco.
- Kiran Kotla, M.S., “Adapting the delay-based protocol PERT to heterogeneous environments”, Aug. 2008, later at Cisco.
- Camelia Al-Najjar, M.S., August 2005, thesis on “An approach for improving performance of aggregate voice over IP traffic”, pursuing Ph.D. at Case Western University.
- Saurabh Jain, M.S., May 2005, thesis on “LTCP-RC: RTT compensation technique to scale highspeed protocols to high RTT links”, later at Cisco.
- Sridhar Vellanki, M.S., Feb. 2003, thesis on “Improving service availability through alternate routing”, later at Microsoft.
- Sadry, Nauzad, M.S., Dec. 2002, thesis on “Evaluation of Delayed Congestion Response protocols for tolerating channel errors in wireless networks”, later at Netezza.
- Achanta, Phani, M.S., Dec. 2002, thesis on “Design and Evaluation of Partial State Routers”, later at IBM.
- Smitha, M.S. student, May 2001, thesis on “An active queue management scheme to contain high bandwidth flows at a congested router”, later at Intel India.
- Sumitha Bhandarkar, M.S., August 2001, thesis on “Delayed Congestion Response Protocols”, Ph.D. at TAMU.
- Aman Garg, M.S., August 2001, thesis on “Mitigating Denial of Service using QOS regulation”, later at Tipping Point Technologies, Austin.

- Sai Gopalakrishnan, M.S., May 2000, later at Cisco, thesis on “TRIO: Active resource management in differentiated services networks”.
- Qian Ren, M.S., May 2000, later at Lucent, thesis on “MPEG-aware disk storage system”.
- Marcus Grande, M.S., Dec. 1999, later at IBM, thesis on “Multiported Storage Devices”.
- Adnan Khaleel, M.S., Aug. 1999, later at Motorola, thesis on “Request and data distribution on a clustered server”.
- Deying Tong, M.S., May 1999, later at Cisco, thesis on “Partial state based approaches to QOS enhancement”.
- Sumit Gupta, M.S., Aug. 1998, later at Sun Labs, thesis on “IPRP: A client-oriented IP redirection mechanism and its applications”.
- Ashwin Madhwaraj, M.S., May 1998, later at Cisco, thesis on “Adaptive video transport over networks”.
- Gang Ma, M.S., May 1998, later at EMC Corp., thesis on “Evaluation of storage systems based on network attached storage”.
- Mike Nichols, M.S., May 1998, later at UT Law School, thesis on “Personal informal retrieval agent”.
- Ikjun Yeom, M.S., May 1998, later a faculty member at KAIST, Korea, thesis on “ENDE: An End-to-end Network Delay Emulator”.

Service:

- Chair, Department Growth Committee, 2013.
- Chair, College Taskforce on National Security, 2013.
- Member, College Research Strategy Subcommittee, 2012.
- Member, Computer Science and Engineering Head Search Committee, 2010-11.
- Member College Awards Committee 2006-2008. 2010-Present.
- Actively participating in improving undergraduate research experience. Co-PI of NSF REU grant. Advised 7 undergraduate students in the last few years.
- Member, Computer Engineering Curriculum Committee, 2003-2012. Led the restructuring of Undergraduate curriculum in Computer Engineering.

- Member, Department Tenure & Promotion Committee, 2004-2006, 2010-2012.
- Member, Electrical and Computer Engineering Department Head Search Committee, 2004.
- Member, Department Advisory committee 2003-2004.
- Chair and Member, department Awards committee 2004-2006.
- Member, Department Awards committee, 1997-2003, 2008-2009.
- Member, Department Distinguished Speakers committee, 1996-1999, 2006-2008.
- Chair and Member, Department Distinguished Speakers committee, 2010-present.
- Member, Department undergraduate studies committee, 1997-2000.
- Member, Department web site design committee, 2000-2004.
- Group leader, Computer Engineering, 2005-present.

¹Reddy's Students.