# Ketan Mayer-Patel

154 Fred Brooks Building
Department of Computer Science, CB #3175
University of North Carolina, Chapel Hill

kmp@cs.unc.edu
http://www.cs.unc.edu/~kmp

## Education

Ph.D. University of California, Berkeley, 1999
*Parallel Software-only Video Effects Processing*

M.S. University of California, Berkeley, 1997
*Design and Performance of the Berkeley Continuous Media Toolkit*

B.A. University of California, Berkeley, 1992
Majors: Computer Science and Economics

## Professional Experience

Associate Professor
University of North Carolina, Chapel Hill, NC (August 2005 – present)

Assistant Professor
University of North Carolina, Chapel Hill, NC. (January 2000 – August 2005)

Visiting Researcher
Microsoft Bay Area Research Center (BARC), San Francisco, CA. (June 2003 – December 2003)

Graduate Student Researcher
University of California, Berkeley, CA. (June 1993 – November 1999)

Graduate Student Instructor
University of California, Berkeley, CA. (August 1997 – December 1997)

Programmer
University of California, Berkeley, CA. (June 1992 – June 1993)

Programmer
United States Department of Agriculture, Albany, CA. (May 1991 – June 1992)

## Honors and Notables

- National Science Foundation CAREER Award, 2003
- Computer Science Student Association Teaching Award, 2003
- Invited to three major meetings (one domestic and two international) of top multimedia researchers to discuss future directions for the field.
- In the sixteen-year history of the ACM SIGMultimedia Conference, considered to be the premier conference in the field of multimedia, I have published twelve papers in ten different years.

## Publications

*Refereed Journals*

K. Mayer-Patel and D. Gotz, "Scalable, Adaptive Streaming for Nonlinear Media," *IEEE Multimedia,* vol. 14, no. 3 (15 pages).

D. Ott and K. Mayer-Patel, "An open architecture for transport-level protocol coordination for distributed multimedia applications," *ACM Transactions on Multimedia Computing, Communications, and Applications*, vol. 3, no. 3 (22 pages).

D. Gotz and K. Mayer-Patel, "GAL: A middleware library for multidimensional adaptation," under review for *ACM Transactions on Multimedia Computing, Communications, and Applications* (21 pages).

K. Mayer-Patel, B. Smith, and L.A. Rowe, "The Berkeley software MPEG-1 video decoder," to appear in *ACM Transactions on Multimedia Computing, Communications, and Applications,* vol. 1, no. 1 (23 pages).

K. Mayer-Patel and S.-U. Kum, "Real-time multi depth stream compression," *ACM Transactions on Multimedia Computing, Communications, and Applications,* vol. 1, no. 2 (26 pages).

D. Gotz and K. Mayer-Patel, "A Framework for Scalable Delivery of Digitized Spaces," *International Journal on Digital Libraries*, vol. 5, no. 3 (14 pages).

J. Considine, K. Mayer-Patel, and J. Byers, "A case for testbed embedding services," *Computer Communication Review*, vol. 34, no. 1, January 2004, pp. 137-142.

*Refereed Conferences and Workshops*

K. Mayer-Patel, "Systems challenges of media collectives: Supporting media collectives with adaptive MDC," *Proceedings of the 15th International ACM Conference on Multimedia,* Augsberg, Germany, 2007, pp. 625-630.

S. Krishnan and K. Mayer-Patel, "A utility-driven framework for loss and encoding aware video adaptation," *Proceedings of the 15th International ACM Conference on Multimedia,* Augsberg, Germany, 2007, pp. 1026-1035.

D. Gotz and K. Mayer-Patel, "A general framework for multidimensional adaptation," *Proceedings of the 12th International ACM Conference on Multimedia,* New York, 2004, pp 612-619.

D. Ott and K. Mayer-Patel, "Coordinated multi-streaming for 3D tele-immersion," *Proceedings of the 12th International ACM Conference on Multimedia*, New York, NY, 2004, pp. 596-603.

D. Ott and K. Mayer-Patel, "Aggregate congestion control for distributed multimedia applications," *Proceedings of IEEE Infocom '04*, Hong Kong, 7-11 March 2004, vol. 1, pp. 13-23.

K. Mayer-Patel and W. Miaw, "Evaluating the effectiveness of automatic PVR management," *Proceedings of the SPIE Conference on Storage and Retrieval Methods and Applications for Multimedia*, San Jose, CA, January 2004, vol. 5307, pp. 360-365.

S.-U. Kum, K. Mayer-Patel and H. Fuchs, "Real-time compression for dynamic 3D environments," *Proceedings of the 11th International ACM Conference on Multimedia*, Berkeley, CA, 2003, pp. 185-194.

N. Kelshikar, X. Zabulis, J. Mulligan, K. Daniilidis, V. Sawant, S. Sinha, T. Sparks, S. Larsen, H. Towles, K. Mayer-Patel, H. Fuchs, J. Urbanic, K. Benninger, R. Reddy and G. Huntoon, "Real-time terascale implementation of tele-immersion," *Proceedings of the International Conference on Computation Science*, Melbourne, Australia, 2003, Springer-Verlag Lecture Notes in Computer Science vol. 2660, pp. 33-42.

K. Mayer-Patel, L. Le and G. Carle, "An MPEG performance model and its application to adaptive forward error correction," *Proceedings of the 10th International ACM Conference on Multimedia*, Juan-les-Prins, France, 2002, pp. 1-10.

D. Gotz and K. Mayer-Patel, "IRW: an incremental representation for image-based walkthroughs," *Proceedings of the 10th International ACM Conference on Multimedia*, Juan-les-Prins, France, 2002, pp. 67-76.

D. Ott and K. Mayer-Patel, "A mechanism for TCP-friendly transport-level protocol coordination," *Proceedings of the USENIX Technical Conference*, Monterrey, CA, 2002 (14 pages).

A. Wilson, K. Mayer-Patel and D. Manocha, "Spatially-encoded far-field representations for interactive walkthroughs," *Proceedings of the 9th International ACM Conference on Multimedia*, Ottawa, Canada, 2001, pp. 348-357.

D. Ott and K. Mayer-Patel, "Transport-level protocol coordination in cluster-to-cluster applications," *Proceedings of the 8th International Workshop on Interactive Distributed Multimedia Systems (Lecture Notes in Computer Science)*, vol. 2158, Springer, 2001, pp. 10-22.

D. Yu, D. Wu, K. Mayer-Patel and L.A. Rowe, "dc: a live webcast control system," *Proceedings of the SPIE Conference on Multimedia Computing and Networking*, vol. 4312, San Jose, CA, 2001, pp. 111-122.

K. Mayer-Patel, "Incorporating application-level knowledge into the MPEG-2 coding model," *Proceedings of the Workshop on Network and Operating System Support for Digital Audio and Video (NOSSDAV)*, Chapel Hill, CA, 2000, (6 pages).

K. Mayer-Patel and L.A. Rowe, "Exploiting spatial parallelism for software-only video effects processing," *Proceedings of the SPIE Conference on Multimedia Computing and Networking*, vol. 3654, San Jose, CA, 1999, pp. 252-263.

K. Mayer-Patel and L.A. Rowe, "A multicast control scheme for parallel software-only video effects processing," *Proceedings of the 7th International ACM Conference on Multimedia*, Orlando, FL, 1999, pp. 409-418.

K. Mayer-Patel and L.A. Rowe, "Exploiting temporal parallelism for software-only video effects processing," *Proceedings of the 6th International ACM Conference on Multimedia*, Bristol, England, 1998, pp. 161-169.

T.H. Wong, K. Mayer-Patel and L.A. Rowe, "A software-only video production switcher for the Internet MBone," *Proceedings of the SPIE conference on Multimedia Computing and Networking*, vol. 3310, San Jose, CA, 1998, pp. 28-41.

K. Mayer-Patel and L.A. Rowe, "Design and performance of the Berkeley Continuous Media Toolkit," *Proceedings of the SPIE conference on Multimedia Computing and Networking*, vol. 3020, San Jose, CA, 1997, pp. 194-206.

K. Mayer-Patel, D. Simpson, D. Wu, and L.A. Rowe, "Synchronized continuous media playback through the World Wide Web," *Proceedings of the 4th International ACM Conference on Multimedia,* Boston, MA, 1997, pp. 435-436.

L.A. Rowe, K. Patel, and B. Smith, "MPEG video in software: representation, transmission, and playback," *Proceedings of the SPIE conference on High-Speed Networking and Multimedia Computing*, vol. 2188, San Jose, CA, 1994, pp. 134-144.

K. Patel, B. Smith, and L.A. Rowe, "Performance of a software MPEG video decoder," *Proceedings of the 1st International ACM Conference on Multimedia,* Los Angeles, CA, 1993, pp. 75-82.

Software Artifacts

**mpeg_play**

The first publicly available MPEG-1 video decoder originally released in 1993. Over 1,000,000 copies of this program have been downloaded. It has been used as a code base for innumerable research and open source systems. Mayer-Patel was the architect of the original code that was later refactored and maintained by a number of other individuals.

**The Berkeley Continuous Media Toolkit**

The Berkeley CMT provided a framework within which to develop experimental multimedia tools and applications. Although primarily used by researchers at UC Berkeley, it was employed by a number of different research groups world-wide. Development of CMT ended in approximately 1998.

**MPEG2Event**

This recently released C# library allows researchers to rapidly develop MPEG-2 analysis tools that are interested in the details of bit-level coding elements. Although currently in use

by only a small number of researchers, it is freely available at http://www.cs.unc.edu/~kmp/mpeg2event. Further development of the library is on-going.

## Teaching

**COMP 416: Introduction to Web Programming**
My goal with this course is to pique student interest for more detailed upper-division courses in operating systems, networking, databases, security, etc. while satisfying their practical interest in developing web programming skills.

**COMP 426: Advanced Web Programming**
A follow-on course to COMP 416, this course expands on client-server programming concepts and concentrates more attention to the design and use of databases and XML-related technologies.

**COMP 249: Multimedia Computing and Networking**
This course is an advanced graduate-level course that covers the fundamental concepts in multimedia computing and networking. Students are expected to complete an extensive final project, some of which have led to publications in refereed conferences and workshops.

**COMP 249-080: Topics in Multimedia Systems**
This seminar course provides students with an opportunity to read and present the most research literature in multimedia systems.

## Research Areas

**Coordinated Multistreaming**
In this project, we are developing mechanisms to address the needs of distributed multimedia applications that employ many (i.e., 10's or 100's) of different media flows with complex inter-stream semantics and adaptation requirements. This project addresses fundamental problems in protocol coordination and aggregate congestion control.

**Multidimensional Adaptation**
We are developing a framework for compactly expressing and evaluating adaptation policies that must negotiate tradeoffs in real-time within very large multiresolutional datasets with high dimensionality.

**StrandCast**
StrandCast is an application-layer multicast protocol intended for latency-insensitive multimedia applications such as receiver-driven layered multicast and pyramid broadcasting. The design and implementation of StrandCast exploits the lax latency requirements of these applications to optimize for link stress, rapid joins and leaves, and robustness in the face of node failure.

DOCKET ALARM

# Explore Litigation Insights

Docket Alarm provides insights to develop a more informed litigation strategy and the peace of mind of knowing you're on top of things.

## Real-Time Litigation Alerts

Keep your litigation team up-to-date with **real-time alerts** and advanced team management tools built for the enterprise, all while greatly reducing PACER spend.

Our comprehensive service means we can handle Federal, State, and Administrative courts across the country.

## Advanced Docket Research

With over 230 million records, Docket Alarm's cloud-native docket research platform finds what other services can't. Coverage includes Federal, State, plus PTAB, TTAB, ITC and NLRB decisions, all in one place.

Identify arguments that have been successful in the past with full text, pinpoint searching. Link to case law cited within any court document via Fastcase.

## Analytics At Your Fingertips

Learn what happened the last time a particular judge, opposing counsel or company faced cases similar to yours.

Advanced out-of-the-box PTAB and TTAB analytics are always at your fingertips.

## API

Docket Alarm offers a powerful API (application programming interface) to developers that want to integrate case filings into their apps.

**LAW FIRMS**
Build custom dashboards for your attorneys and clients with live data direct from the court.

Automate many repetitive legal tasks like conflict checks, document management, and marketing.

**FINANCIAL INSTITUTIONS**
Litigation and bankruptcy checks for companies and debtors.

**E-DISCOVERY AND LEGAL VENDORS**
Sync your system to PACER to automate legal marketing.