

# Why Multimedia Still Matters

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## 1 The State of the Field

In order to forsee the future of multimedia, I think it is important to identify what motivated the formation of the subfield in the first place. In my opinion, the field has tackled problems in the intersection of more traditional subfields (i.e., operating systems, networking, graphics, coding theory, vision, etc.) because its driving applications demanded integrated solutions in order to achieve desired results. In other words, the application was somehow more than just the sum of its parts.

Thus, when we experimented with the first Internet-based video conferencing applications over a decade ago, it was important to investigate and understand how video representations could be made network aware (and vice versa), the demands of media processing on the operating system, the relationship between video and audio from a perceptual quality point of view, and so on. The lessons learned developing systems that negotiated these complex tradeoffs are the real successes of multimedia as a field and where our contribution has been most fundamental.

In order to keep the field moving forward, we must seek out the applications of the future that demand integrated solutions with complex tradeoffs. Video conferencing is no longer a candidate. Nor is video-on-demand. While these applications once tested the limits of the systems we could build and inspired interesting new multimedia research, Moore's law, larger storage capacities, and fatter pipes have made these applications less compelling. A "poor" solution to these problems that inefficiently and naively throws resources at the problem will now work as well as a well-crafted, elegant, and innovative solution.

Given advances in processors, storage, and networking, then, what kinds of new applications now contain the types of challenges that video conferencing and video-on-demand once did? I believe there are a few characteristics to look for. First, we must be true to the prefix *multi-*. Multimedia of the future will not be video and audio, multimedia of the future will be tens of streams with complex interstream semantic relationships such as the thirty or so cameras used to capture almost every conceivable angle of the Superbowl. Second, we should broaden our notion of media. We need to include bioinformatic sensors, stock tickers, sports scores and statistics, and other sources of periodic, correlated, information in the same framework as video and audio. Third, interactivity and the user experience will remain a source of challenges. Fourth, rapid advances in graphics hardware, capture devices (e.g., cameras and microphones), and display devices (e.g., digital light projectors) should inspire us to build applications that employ them in new and different ways.

The following is a list of application areas that I believe have many of these characteristics and will drive the future of multimedia as a field. Clearly, this list is far from complete or comprehensive and reflects my own personal research biases:

- Large-scale peer-to-peer streaming
- Distributed virtual environments
- Ad hoc home-based media environments
- Teleimmersion
- Low bandwidth sensor-based applications

- Gaming
- Multimedia information retrieval and management systems

## 2 The State of the Conference

The cornerstone of our community of researchers has been and should continue to be the ACM Multimedia conference. We have a lot to be proud of. Acceptance rates are extremely competitive keeping quality reasonably high. The doctoral symposium has been a great success. The three track system has been useful for managing submissions from across such a wide array of areas.

In order to ensure its success, however, we must think creatively about how we organize and run this annual meeting and not be lulled into complacency. I describe three specific suggestions below as examples of kinds of changes that we might consider which I hope will spark discussion.

- Organize and run a challenge competition.  
The idea here is to define a specific challenge environment and inputs for a type of research problem. For example, scene detection or application-level multicast streaming may be target problem areas. As part of the call for participation, a specific API and metric used for success is published. Researchers are invited to participate by submitting software solutions (or better yet, the address of a web service interface to their solution). At the conference, the results of the challenge competition are presented along with an award to the winning system.
- Invite a panel of outside researchers in a related field.  
Each year, find three leaders in an area related to multimedia (vision, graphics, networking, operating systems, etc.) that have never attended ACM Multimedia to participate in a panel in order to give their view of how multimedia problems intersect with their field. Allocate a modest travel and accommodation budget and waive the conference registration as an incentive to participate.
- Invite on-line feedback and discussion.  
The presence of wireless connectivity at conferences is becoming increasingly commonplace. We can employ this resource to provide on-line chat rooms and instant messaging between conference participants. Transcripts of the public chat room can be made available so that presenters can review the discussion and reply later in the day. Anonymous feedback and discussion may be worthwhile feature.

Some of these suggestions are bit off-the-wall, but I think that creative experimentation is the key to keeping the conference fresh and interesting.