# CS290F - Paper Reviews for 2010.02.01

## Review for: K. Almeroth and M. Ammar, "An Alternative Paradignm for Scalable On-Demand Applications: Evaluating and Deploything the Interactive Multimedia Jukebox"

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In general, when presented with a truly well-written paper, providing an adequate review is both a pleasure and a challenge for the reviewer: a pleasure, because reading the paper was a pleasant, informative experience; a challenge, because finding something adequate to say about the paper is difficult, as the paper has already nicely presented and supported its point. This paper is one such well-written paper: the content is well written, the task is well presented, and the findings are well developed.

The paper presents a general scheme for an "Interactive Multimedia Jukebox" as an alternative to the then-existing video-on-demand services of the time, in an effort to provide a scalable solution to the problems of allowing viewer control over content availability and scheduling. After presenting the concept of a multimedia jukebox, the paper goes on to discuss a prototype implementation of the concept, along with data collected over a couple of years of running the prototype. Finally, after analyzing the data collected from the prototype, results from a simulation of a larger-scale deployment are presented and analyzed to provide further insight into the concept. Any of the concept, prototype, or simulation could have been made into an adequate paper on their own, but presenting all three sections in a single paper makes a compelling case for the IMJ.

Oftentimes, one of the most difficult sections of a paper to write is the abstract itself. As the abstract is the first (and many times, the only) section of a paper to be read by a reviewer, it must make a strong case that the paper makes a strong contribution to the field in order to convince the reader that the paper is worth their time. The abstract for this paper provides a very thorough summary of the paper, presented in clear, well-written prose that presents the problems and the provided solutions without requiring that the reader already be an expert in the field of networked multimedia to understand what that paper is going to be about. This abstract does quite a nice job presenting the contents of the paper's 9700+ words in a succinct 204 words.

In the introductory section of the paper, the reader is presented with a nice summary of the state-of-the-art in video broadcasting services, including a discussion of the problems faced by 1998-era content providers in providing VoD services to their customers. This discussion nicely dovetails into a presentation of the jukebox paradigm which is developed more thoroughly in later sections and a discussion of scheduling problems faced by content broadcasting.

As the paper continues to investigate available scheduling options, the reader is presented with an insightful and complete list of scheduling policies available to the VoD spectrum. As an aid to doing so, Figure 1 demonstrates the natural curve of tradeoffs that are made in

selecting a scheduling paradigm ranging from VoD to broadcast television. By itself, Figure 1 is a nice overview of that relationship, but not particularly deep. However, as the paper progresses to discuss the flexibility of the scheduling possibilities available to the multimedia jukebox, the paper presents Figure 2. The overlay of the capabilities of the jukebox scheduler on top of Figure 1 is a powerful technique to show the flexibility of the proposed system.

The "evaluation section" of the paper covers both the results gathered from the implemented prototype, and the results from running a large-scale simulation based on those results. As with the rest of the paper, the data is presented in a meaningful, accessible manner that leaves very little to be critiqued upon. As the paper concludes, the reader is left with a good understanding of the proposed jukebox solution and an analysis demonstrating how well it can perform in the task of delivering consumer-requested content in a scalable manner.

This paper was published in 1999, and had been in development since at least 1996 -- which of course means that things have changed over the last decade. Obviously, the introduction of content delivery networks by Akamai and other competitors changes some of the requirements as set out by the paper, as now VoD schemes can be implemented more scalably, since any individual content server may only be hosting content for a small number of viewers. However, beyond that development, there are still a few interesting topics left to the reader to dwell upon:

- This paper presents the case of a need for consumer-selected video services. However, par-for-the-course in cable and satellite television services is still provider scheduled content. Providers are beginning to allow more and more VoD at varying price-points, but the majority of content is still originally provided at specific times. TiVo and similar solutions have put some scheduling control in the hands of the viewer, but the original content scheduling is still controlled by the network, and the the client is limited by available media storage.
- Also, the advent of YouTube, Hulu, iTunes, Netflix instant-watch, and dozens of other online providers is beginning to change the landscape of content distribution -- rather than consuming from the cable or satellite television provider, content is directly accessible, on demand from the web.[1]

This paper provides an insightful method of providing consumer requested content in a scalable manner. Additionally, it includes an evaluation of a working prototype, and a simulation that provides potential deployments with insight into how the system would perform.

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1. For example, many viewers no longer subscribe to a broadcast based system, and instead choose to rely solely on the internet for content. This phenomenon is mostly present in younger generations (e.g, college and recently post-college) or technologically inclined viewers, but seems to be growing in scope.