

Computer Science Seminar Series, 2010

National Capital Region

Online Scheduling Algorithms for Buffer Management

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Abstract

The Internet has become the major information infrastructure in our modern times. Numerous requests from Internet users and their applications compete for shared resources. In order to provide high quality services, it is critical to develop online algorithms that optimally allocate limited network resources such as link bandwidth and buffer space.

In this talk, I will present several online buffer management models and their algorithmic solutions. The proposed algorithms and their analyses have the following novel features. The single-buffer algorithm generates virtual “dummy”-packets whose status encodes relevant information about the past behavior of the algorithm. Although these dummy packets cannot be transmitted, they facilitate the choices made by the algorithm. The developed analysis scheme does not depend on the classic potential function approach explicitly. Instead, it modifies the algorithm’s buffer judiciously and assigns an appropriate credit to the adversary to account for these modifications. This new analysis approach leads to a simple and elegant optimal online algorithm for the agreeable-deadline model.

Biography

Dr. Fei Li is an assistant professor in computer science at George Mason University. He works on designing and analyzing online and approximation algorithms, especially in the areas of managing resources such as buffer spaces, power, and energy efficiently in an online manner. Dr. Li received his Ph.D. in Computer Science from Columbia University, February 2008. More information can be found at: <http://www.cs.gmu.edu/~lifei>