Joint Rate Control and Scheduling for Real-Time Wireless Networks

ABSTRACT

➤ This paper studies wireless networks with multiple real-time flows that have stringent requirements on both per-packet delay and long-term average delivery ratio. Each flow dynamically adjusts its traffic load based on its observation of network status. When the requirements of per-packet delay and delivery ratio are satisfied, each flow obtains some utility based on its traffic load.

➤ We aim to design joint rate control and scheduling policies that maximize the total utility in the system. We first show that the problem of maximizing total utility can be formulated as a submodular optimization problem with exponentially many constraints.

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- We then propose two simple distributed policies that require almost no coordination between different entities in the network. The total utilities under these two policies can be made arbitrarily close to the theoretical upper-bound.

- Extensive simulations also show that they achieve much better performance than state-ofthe-art policies.

EXISTING SYSTEM

Existing work shows that a high variance in data rate can result in poor quality of experience (QoE). A desirable policy should therefore achieve low total variance.

PROPOSED SYSTEM

➢ This project aim to design joint rate control and scheduling policies that achieve the maximum system-wide total utility. We propose an analytical model that incorporates the aforementioned features of real-time applications and the stochastic nature of wireless transmissions.

➢ The problem of maximizing total utility can then be modeled as a submodular optimization problem with exponentially many constraints. While there exists polynomial time algorithms that solve the submodular optimization problem, they still incur high computational complexity and rely on centralized algorithms.

HARDWARE REQUIREMENTS

- Processor - Pentium-IV
- Speed - 1.1 Ghz
- RAM - 256MB(min)
- Hard Disk - 20 GB
- Key Board - Standard Windows Keyboard
- Mouse - Two or Three Button Mouse
- Monitor - SVGA

SOFTWARE REQUIREMENTS

- Tool   -   Network Simulator-2
- Operating system   -   LINUX
- Front end   -   OTCL (Object Oriented Tool Command Language)

REFERENCES

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