



ITU Kaleidoscope 2016
ICTs for a Sustainable World

Adaptive Video Streaming Over HTTP Using Stochastic Bitrate Prediction in 4G Wireless Networks

Dhananjay Kumar
Anna University, India
dhananjay@annauniv.edu

Bangkok, Thailand
14-16 November 2016

Motivation and Proposed Solution Framework

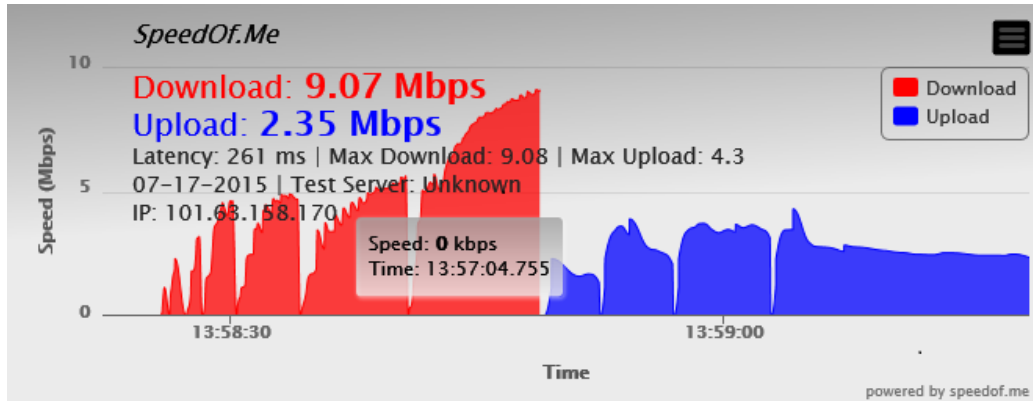


Fig. Bitrate Observed in a 4G Cellular Wireless Network (Airtel 4G LTE-TD Hotspot)

- **Stochastic Prediction Approach**
- **Auto Regressive Integrated Moving Average (ARIMA) Model**

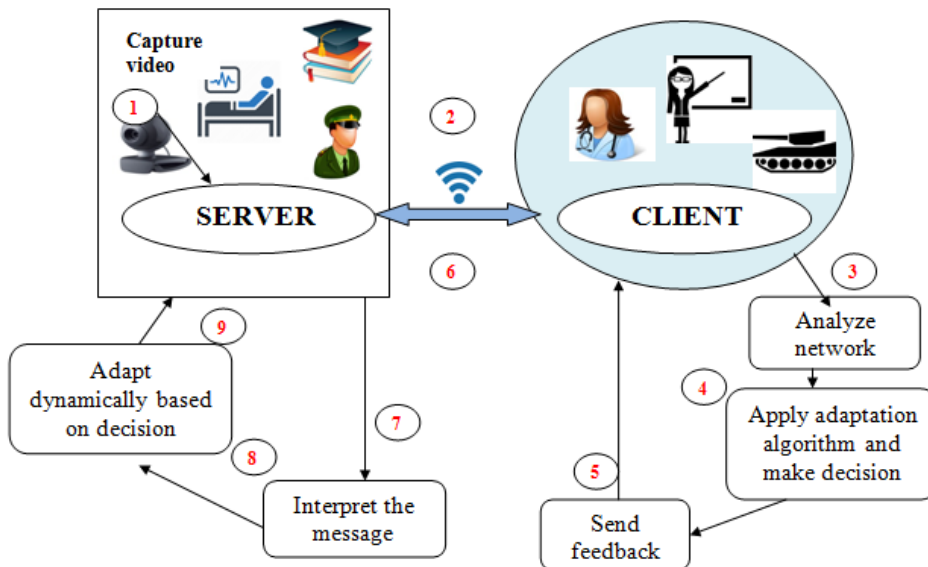


Fig. Architecture Diagram

$$X_{tp} = \delta' + \left(1 + \sum_{i=1}^q \theta_i L^i \right) / \left(1 - \sum_{i=1}^p \phi_i L^i \right) (1-L)^d$$

where

$$\delta' = \delta / \left(1 - \sum_{i=1}^p \phi_i L^i \right) (1-L)^d$$

Implementation Results

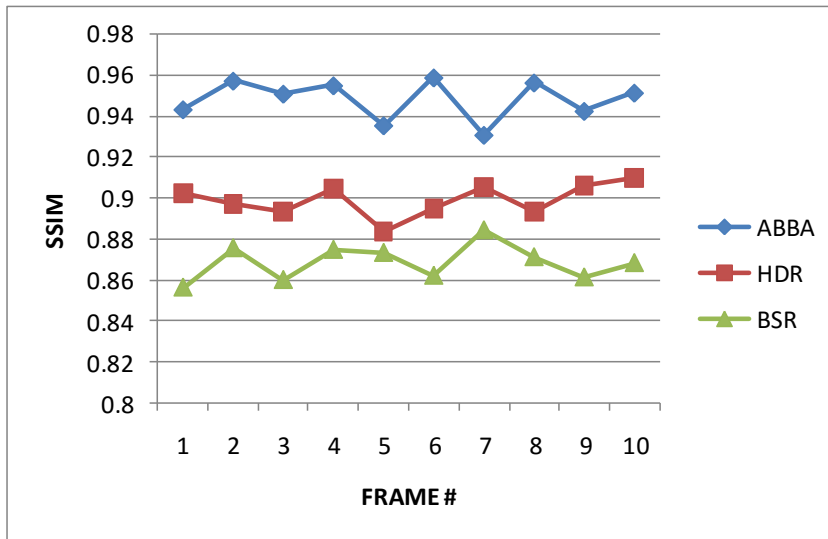


Fig. The SSIM index

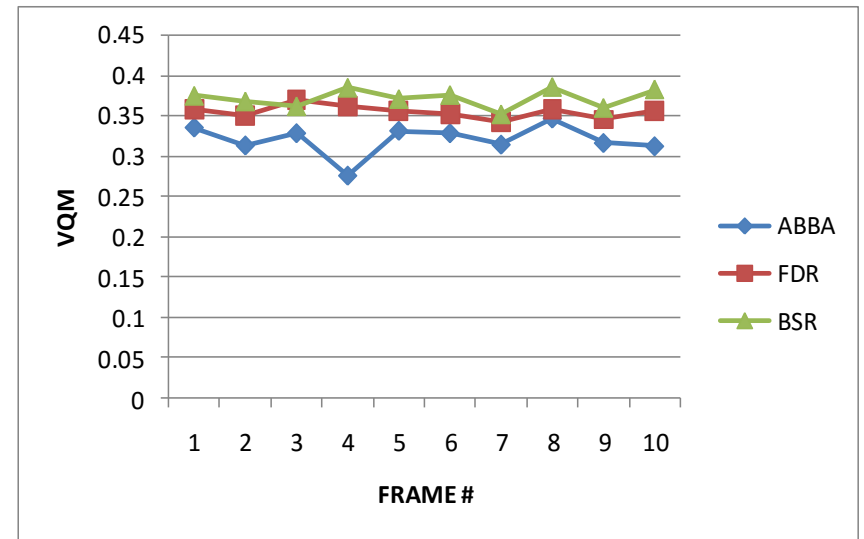


Fig. The VQM index

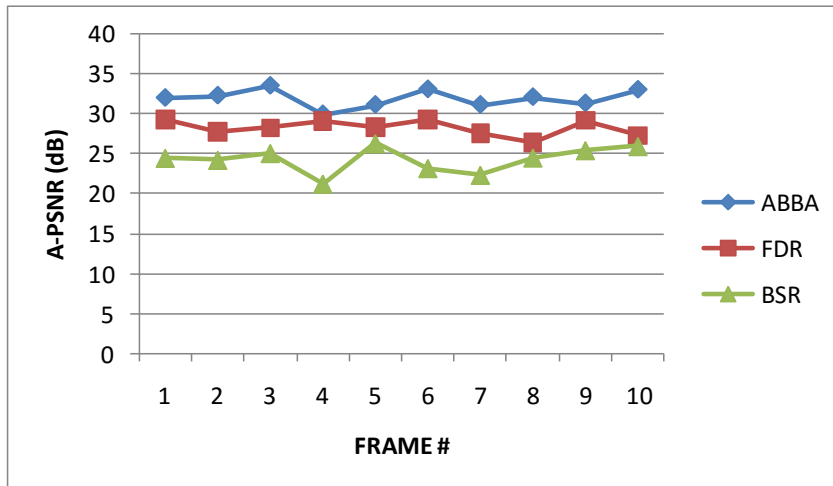


Fig. Aligned-PSNR values

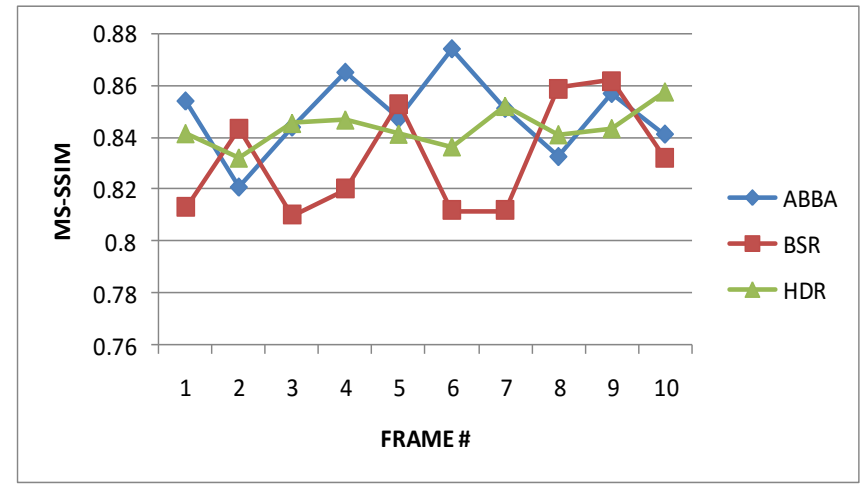


Fig. The Multi Scale SSIM index

Acknowledgements

1. The University Grants Commission
(UGC), India



2. Anna University, India

