

Robust Image transmission using pilot assisted Orthogonal Frequency Division Multiplexing

Nishchal Chaudhary and Lei Cao

Department of Electrical Engineering and Center for Wireless Communication Research

University of Mississippi

nchaudha@olemiss.edu and lcao@olemiss.edu

Orthogonal frequency Division Multiplexing (OFDM) has gained widespread importance for High-speed wireless application owing to its inherent immunity against delay spread and frequency selective fading at low decoding complexity. In OFDM, adaptive modulation has been shown to have significant benefits for high-speed data communication. These adaptive schemes benefit from the Channel State Information (CSI) obtained at the receiver mostly by the use of Pilot Symbols transmitted along with the information data and feeding back the CSI to the transmitter. In these schemes, the modulation technique is varied adaptively on different sub channels to maximize the data transmission rate maintaining a target BER.

In our work we wish to take advantage of the CSI available at the transmitter, fed back from the receiver, to allocate better sub-channels to more important data of an image (MSB for example in case of raw image) and evaluate the performance improvement achieved by our scheme over the ones which do not use this scheme for transmission of image. Channel estimation is being done using a block based pilot assisted estimator. Frequency selective fading channel conditions are used for simulations. Initial simulations performed using MATLAB show favorable results. Further investigations are being made to improve the performance of the above schemes by considering both the adaptive allocation of source data based on relative importance and adaptive modulation of sub carriers.