



BUFFER ASSISTANT AMPLIFY AND FORWARD UAV RELAY

INTRODUCTION

UAV finds many applications in the current wireless communications. These are used in the military, surveillance, and transport sector. While using the UAVs for the communication the power supply in the UAV should be used for both its hovering and as power supply for communication between the source and receiver. To effectively use the power available at the UAV we can design the algorithms so that the maximum power is used for communication purpose rather than hovering purpose.

For optimizing the power supply and to increase the throughput we are proposing a following algorithm Buffer assistant amplify and forward relay.

METHOD

At first we have to find a relation between the capacity and the variables we can optimize to get an optimized solution to the throughput. Then we will apply the MM algorithm to get an effective solution for the throughput by optimizing the SNR which is in proportion to the capacity. In doing so we will use the time slot pairing of received and transferred signal at the UAV. To assist this time slot pairing, a buffer is installed at the UAV for storing the signal until it is transferred from the UAV.

In MM technique, the objective function is optimized by optimizing the surrogate function. MM stands for majorize/minimize in minimization whereas in maximization, MM stands for minorize/maximize. A surrogate function is defined in such a way if the surrogate function is optimized then the objective function is optimized.

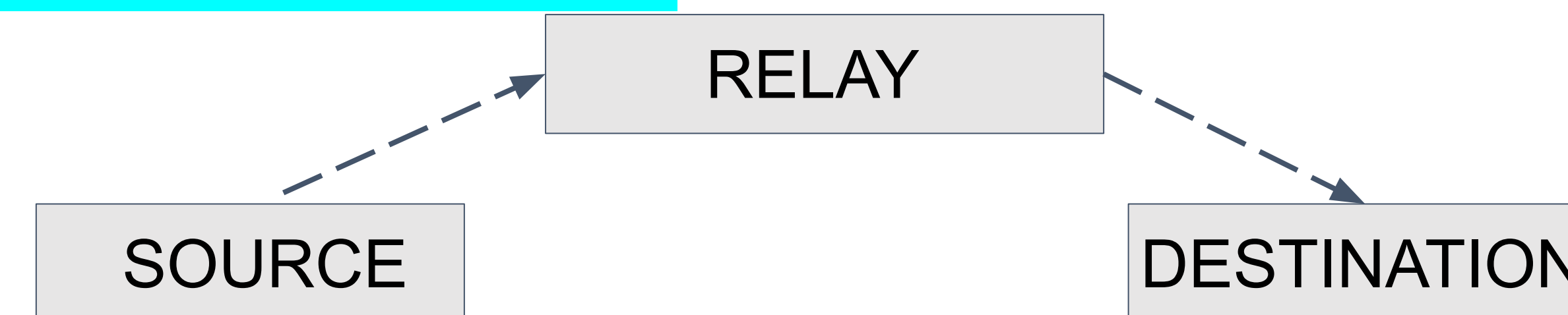
A function $g(y/x)$ is said to be a majorizing function of $f(y)$ iff it satisfies the following two conditions.

- $f(x) = g(x/x)$
- $f(y) \leq g(y/x)$ for all y .

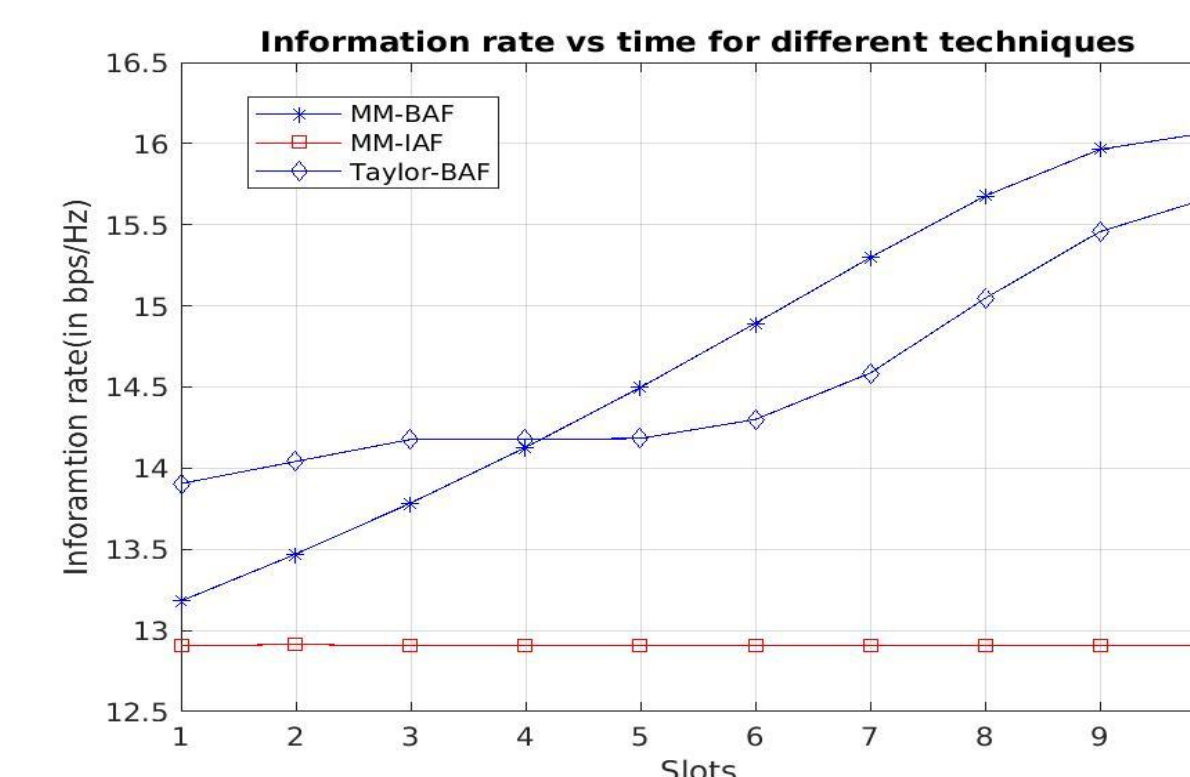
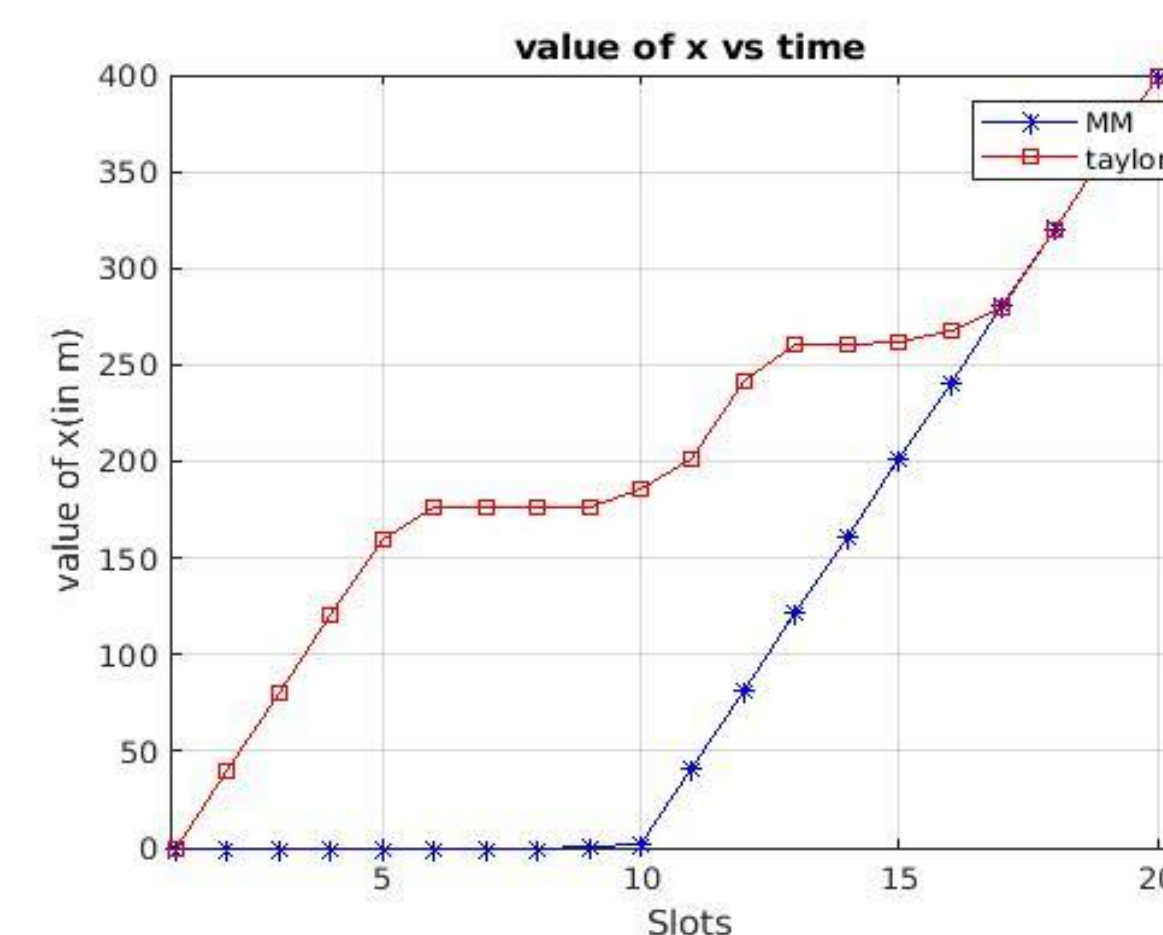
CHALLENGES

- The buffer capacity of the UAV is limited.
- Separate processing required for time slot pairing at the buffer assistance.
- The solution obtained is not the absolute solution but it is an optimized solution.

COMMUNICATION SETUP



RESULTS



TRANSMITTED INDEX	RECEIVED INDEX	TRANSMITTED INDEX	RECEIVED INDEX
1	20	6	13
2	19	7	15
3	18	8	14
4	17	9	11
5	16	10	12

In the side table the transmitted and received indices which are not identical i.e., the signal is not received and transmitted at the same time it is being stored at the UAV for obtaining better throughput than the instant relay.

CONCLUSION

- By using Buffer and MM algorithm we are able to achieve better results when compared to Taylor series technique and instant amplify and forward relay (as shown in the plots).
- Along with improved throughput we are able to achieve the secrecy of data since the information is stored at the UAV for the efficient time slot pairing. In doing so we need not instantly transfer the received at the UAV.