

Figure 2: Gradient of Semidefinite relaxation

This shows gradient of Semi definite Relaxation which gives the information about the connectivity in network. The clearly depicts connectivity among different nodes in network.

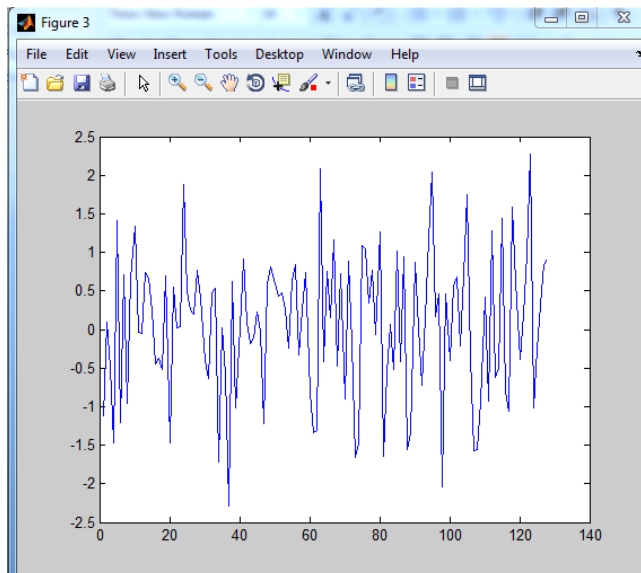


Figure 4: Gradient of Dynamic Semidefinite Relaxation

This shows gradient of Dynamic Semidefinite Relaxation which gives the information about the connectivity in network. The clearly depicts far better connectivity among different nodes in network.

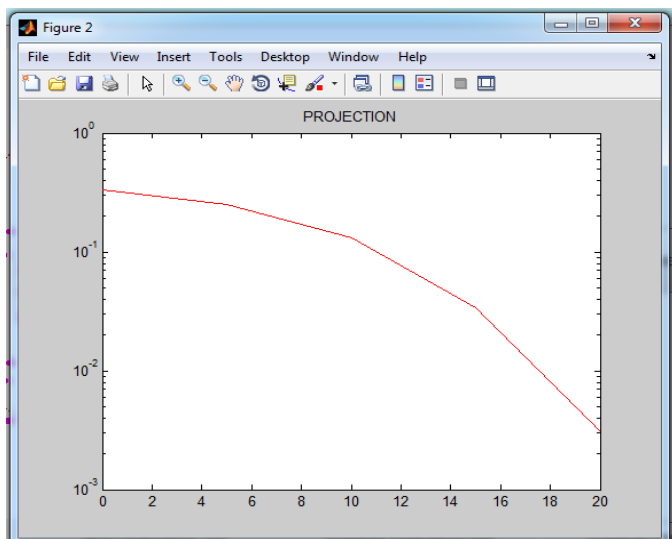


Figure 3: Projection of Semidefinite Relaxation

This shows projection of Semidefinite Relaxation which gives the information about the how much information is being passed from source to sink. The clearly depicts the modes of data travel among different nodes in network.

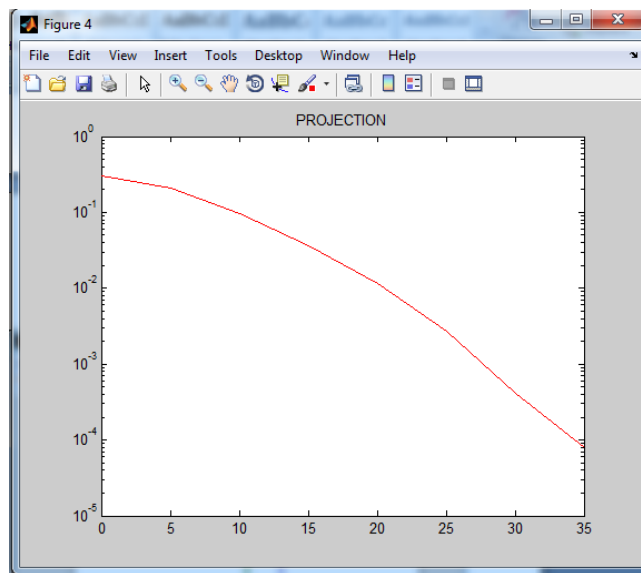


Figure 5: Projection of Dynamic Semidefinite Relaxation

This shows projection of Dynamic Semidefinite Relaxation which gives the information about the how much information is being passed from source to sink. The clearly depicts better the modes of data travel among different nodes in network.

B .Comparison Graphs

Many terms are used to evaluate the performance of Dynamic Semi definite Relaxation with existing Semi definite Relaxation. The following metrics are often chosen to compare the Performance of various routing protocols:

1) Optimal transmission Power

The optimal common transmits power for wireless networks. In particular, the optimal common transmit power has been defined as the minimum transmit power sufficient to preserve network connectivity. An analytical closed-form expression for the optimal common transmits power is derived. This is

particularly useful for network planning as it allows one to determine the minimum power to use while keeping the network connected.

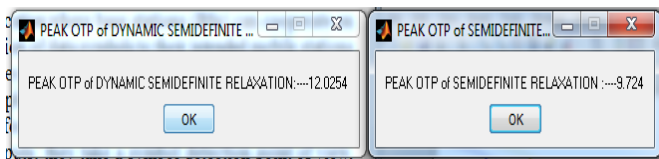


Figure 6: Peak OTP Comparison

Peak comparison of OTP shows that there is gradual decrease in power required to perform the same set of sending from source to destination. The decrease in power is by 19.16% that again indicate increase in performance of Dynamic Semidefinite Relaxation in comparison with existing ant Based Routing Algorithm.

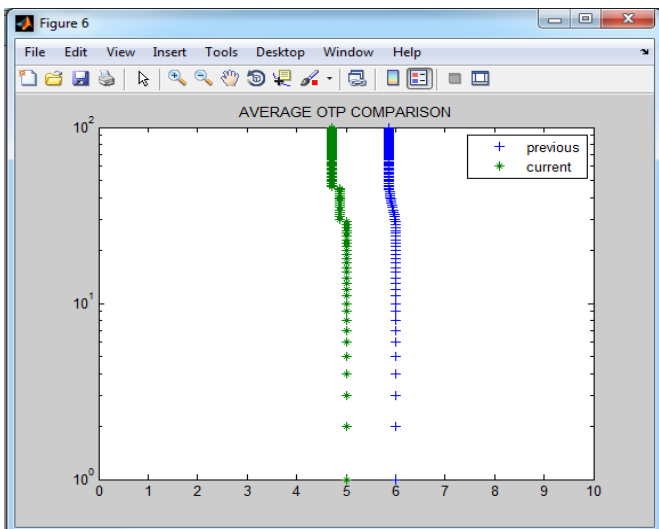


Figure 7: Average OTP Comparison

In the figure 7, average OTP comparison shows that less transmission power is required to perform same set of task of sending data from Source to sink at the centre. Lesser is Power of transmission more is energy saved.

2) SNR

In analog and digital communications, signal-to-noise ratio, often written as S/N or SNR, is a measure of signal strength relative to unwanted interference or noise. The ratio is usually measured in decibels (dB). Signal-to-noise ratio is sometimes used informally to refer to the ratio of useful information to false or irrelevant data in a conversation or exchange.

If the incoming signal strength in microvolts is V_s , and the noise level, also in microvolts, is V_n , then the signal-to-noise ratio, S/N, in decibels is given by the formula $S/N = 20 \log_{10} (V_s/V_n)$

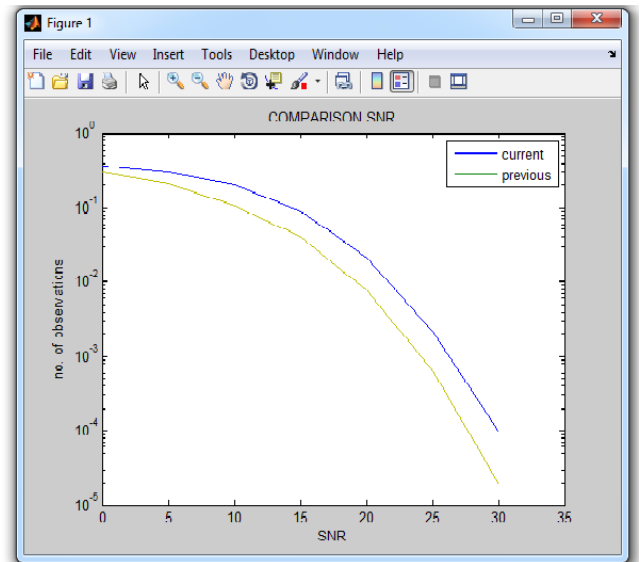


Figure 9: Comparison SNR

The comparison SNR graph shows that Dynamic Semidefinite relaxation has greater slope than semidefinite relaxation. Better performance is achieved in terms of more signal transferred than to noise as compared to the previous algorithm.

5. Conclusions

In this paper, an optimisation technique for less power consumption is created. The algorithm which is used for reducing power requirement has given accurate results and is more efficient than previous algorithms. The proposed Dynamic Semidefinite Relaxation improves the OTP, robustness and SNR. The efficiency of the proposed scheme is shown to be better than other existing schemes. The proposed Dynamic Semidefinite Relaxation uses an optimal path routing and fast route discovery. The established paths provide reliable, shorter and faster communication. Simulation results show that the proposed protocol provides reliable and power efficient routing by attaining high Signal to Noise ratio and low energy consumption compared to the existing Semidefinite Relaxation.

6. Future Work

For future work more addition to this work can be done by using more dynamism in the relaxation scheme. Further, working on the implementation to improve the algorithm can be done. Further investigations include experiments with high network load and multimedia data. Additionally, analysis of the maintenance of the pheromone concentration is needed. There are different ways to manipulate the performance of Dynamic Semidefinite Relaxation, like routing scheme.

References

- [1] Min Li, Chunshan Liu, Iain B. Collings, "Transmitter Optimization for the Network MIMO Downlink with Finite-Alphabet and QoS Constraints", 2013 Australian Communications Theory Workshop (AusCTW)
- [2] Fuxin Zhuang, and Vincent K. N. Lau, "Backhaul Limited Asymmetric Cooperation for MIMO Cellular

- Networks via Semidefinite Relaxation” IEEE Transactions on signal processing, Vol. 62, no. 3, february 1, 2014
- [3] A. Paulraj, R. Nabar, and D. Gore, Introduction to Space-Time Wireless Communications. Cambridge: Cambridge University Press, 2003.
- [4] S. Catreux, P. F. Driessen, and L. J. Greenstein, “Simulation results for an interference-limited multiple-input multipleoutput cellular system,” IEEE Comm. Lett., vol. 4, pp. 334–336, Nov. 2000.
- [5] R. S. Blum, “MIMO capacity with interference,” IEEE J. Select. Areas Commun., vol. 21, no. 5, pp. 793–801, Jun. 2003.
- [6] H. Dai, A. Molisch, and H. Poor, “Downlink capacity of interference-limited MIMO systems with joint detection,” IEEE Trans. Wireless Commun., vol. 3, no. 2, pp. 442–453, Mar. 2004.
- [7] Hongyuan Zhang, Huaiyu Dai, "Cochannel Interference Mitigation and Cooperative Processing in DownlinkMulticell Multiuser MIMO Networks", EURASIP Journal onWireless Communications and Networking 2004:2, 222–235, Hindawi Publishing Corporation
- [8] Arash Khabbazibasmenj, Member, IEEE, Aboulnasr Hassanien, Member, IEEE, Sergiy A. Vorobyov, Senior Member, IEEE and Matthew W. Morency “Efficient Transmit Beamspace Design for Search-Free Based DOA Estimation in MIMO Radar” IEEE Transactions on Signal Processing
- [9] M. Gulam Nabi Alsath and Malathi Kanagasabai, Member, IEEE “Planar Pentaband Antenna for Vehicular Communication Application” IEEE antennas and wireless propagation letters, Vol. 13, 2014
- [10] N.Faruk et.al., (2013) "Techniques for Minimizing Power Consumption of Base Transceiver Station in Mobile Cellular Systems", IJS: International Journal of Sustainability, Vol. 2, No. 1, pp. 1 – 11.
- [11] Chunlong He, Bin Sheng, Pengcheng Zhu, Xiaohu You “Energy Efficient Comparison between Distributed MIMO and Co-located MIMO in the Uplink Cellular Systems” DOI: 10.1109/VTCFall.2012.6398961 Conference: Vehicular Technology Conference (VTC Fall), 2012 IEEE.
- [12] Deruyck, M.; Vereecken, W.; Joseph, W.; Lannoo, B.; Pickavet, M.; Martens, L. “REDUCING THE POWER CONSUMPTION IN WIRELESS ACCESS NETWORKS: OVERVIEW AND RECOMMENDATIONS” Progress in Electromagnetics Research; Dec2012, Vol. 132, p255. 2012.
- [13] D. Gesbert, S. Hanly, H. Huang, S. Shamai Shitz, O. Simeone, and W.Yu, “Multi-cell MIMO cooperative networks: A new look at interference,” IEEE J. Sel. Areas Commun., vol. 28, no. 9, pp. 1380–1408, Dec. 2010.