

ENEL 671 Adaptive Signal Processing Project Report

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Abstract—The purpose of this project is to analyze the performance of three different adaptive algorithms. These algorithms, which can be used for a variety of applications such as echo cancellation and multipath mitigation, are implemented for the purposes of equalizing a dispersive channel. The first algorithm investigated is the Least Mean Squares (LMS). The LMS filter uses a search method to minimize the mean square error. The performance of the LMS is then compared to the Recursive Least Squares (RLS) method, which minimizes a weighted linear least squares cost function. Finally the Recursive Least Squares Lattice algorithm is implemented in the third project for joint process estimation. The algorithms are tested against multiple channels with varying eigenvalue spreads. Furthermore different design parameters such as step size and filter order are evaluated. The performance with regards to convergence speed and complexity is discussed. The RLSL appears to have performance advantages in terms of convergence speed at the cost of a significant increase in complexity.

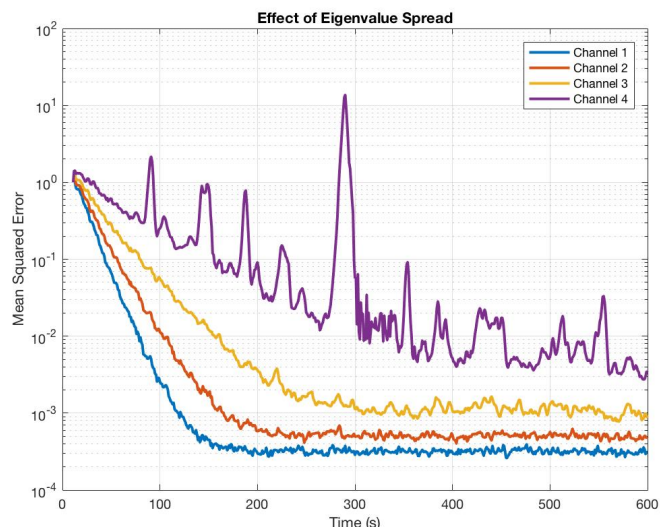


Fig. 2: BLAH BLAH

I. INTRODUCTION

ADAPTIVE filtering is used for a variety of applications. One such use case is for adaptive equalization. That is to remove unwanted signals from the channel output which can be caused by multipath or other distortions

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II. EQUALIZATION METHODOLOGY

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III. PRE EXPERIMENT CALCULATIONS

IV. PROJECT 1: LEAST MEAN SQUARES ALGORITHM

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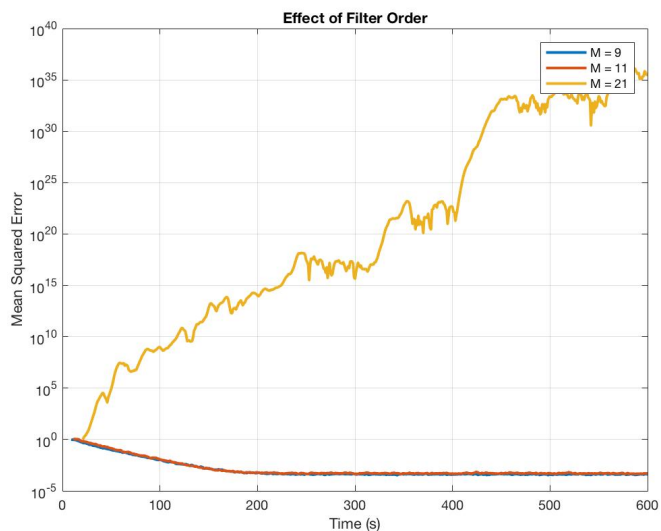


Fig. 3: BLAH BLAH

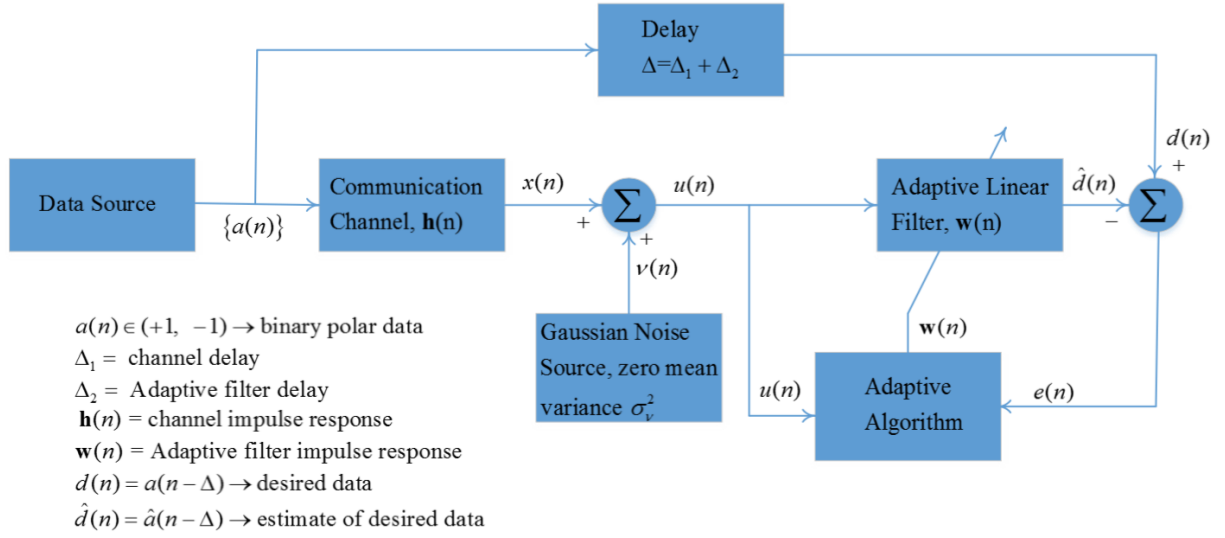


Fig. 1: BLAH BLAH

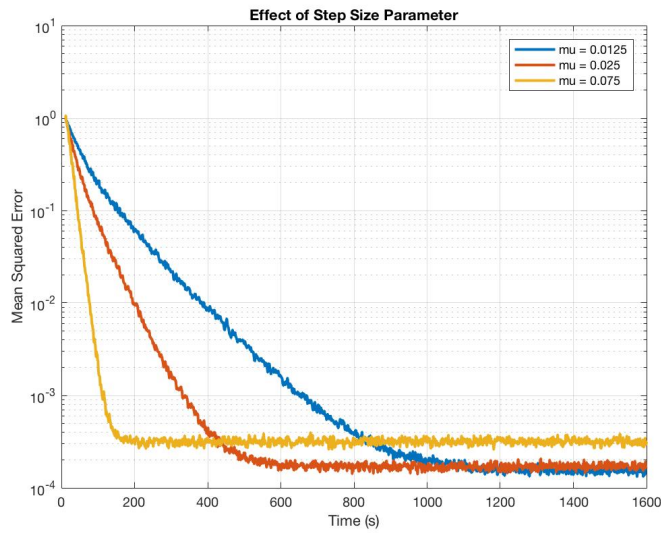


Fig. 4: BLAH BLAH

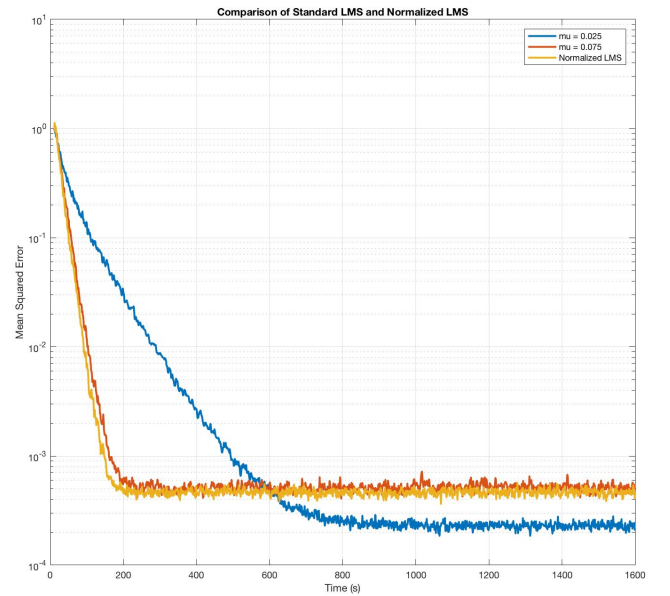


Fig. 5: BLAH BLAH

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V. CONCLUSION

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APPENDIX A

PROOF OF THE FIRST ZONKLAR EQUATION

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APPENDIX B

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ACKNOWLEDGMENT

The authors would like to thank...

REFERENCES

- [1] H. Kopka and P. W. Daly, *A Guide to L^AT_EX*, 3rd ed. Harlow, England: Addison-Wesley, 1999.



Michael Shell Biography text here.

John Doe Biography text here.

Jane Doe Biography text here.