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**Kiran K Mainali\*** ([kirankumar.mainali@mavs.uta.edu](mailto:kirankumar.mainali@mavs.uta.edu)), 3732 Aspen Brook Lane, Fort Worth, TX 76244. *Optimizing  $\ell_1$  Loss Regularizer for Sylvester Type LASSO Problem and Its Application to EEG Inverse Problem.*

We revisit the current state-of-the-art  $\ell_1$  solvers to solve the EEG inverse problem under the sparsity assumption in solutions. We introduce the Sylvester type LASSO model and how it can be deployed into the EEG inverse problem. Conversion of the problem from Sylvester form to regular multi-task LASSO form will increase the size of the problem drastically for which the benchmark  $\ell_1$  solvers cannot be employed because of huge memory requirement and computational complexity. In this talk, we present our novel ideas to handle the large size data matrices by extracting their structures. The proposed algorithm to solve the weighted  $\ell_1$  problem with reweighted techniques to improve the solution will be discussed. (Received September 16, 2019)