1171-94-205   **Aditya Ramamoorthy*** (`adityar@iastate.edu`), Dept. of Electrical and Computer Eng., 2520 Osborn Dr, Ames, IA 50011. *A unified treatment of partial stragglers and sparse matrices in coded matrix computation.*

The overall execution time of distributed matrix computations is often dominated by slow or failed worker nodes (also known as stragglers). Recently, ideas from coding theory have been adapted to these problems; these allow for recovery of the intended result as long as a minimum number (threshold) of worker nodes complete their assigned tasks. Much of prior work uses dense linear combinations of submatrices of the original matrices. However, in several practical scenarios, the original matrices are sparse. This means that prior schemes induce an increase in the worker node computation time that may be unacceptable. Furthermore, much of prior work treats stragglers as erasures and discards partial computations performed by them.

In this work, we present a coded computation scheme which mitigates the increase in sparsity of the encoded matrices and utilizes the partial computations done by the slower workers. Moreover, like prior work our scheme continues to enjoy the optimal recovery threshold. Extensive numerical experiments done in AWS (Amazon Web Services) cluster corroborate our findings. (Received August 10, 2021)