SOMETHING ABOUT ADMM AND SYSTEM IDENTIFICATION POSSIBLY DISTRIBUTED

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ABSTRACT

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Index Terms— One, two, three, four, five

1. INTRODUCTION

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2. PROBLEM STATEMENT

3. DISTRIBUTED BSI

3.1. ADMM?

$\mathcal{T}_i$ is the set of neighboring node indices to which node i sends data.

$\mathcal{R}_i$ is the set of neighboring node indices from which node i receives data.

$$\phi_i^{(k)} = \left[\left\{\hat{h}_{ij}^{(k)\mathrm{T}} \mid j \in \mathcal{R}_i \cup \{i\}\right\}\right]^{\mathrm{T}}$$
$$\gamma_i^{(k)} = \left[\bar{h}_{\{\mathcal{R}_i\}}^{(k)}\right]$$
$$\lambda_i^{(k)} = \left[y_{\{\mathcal{R}_i\}}^{(k)}\right]$$

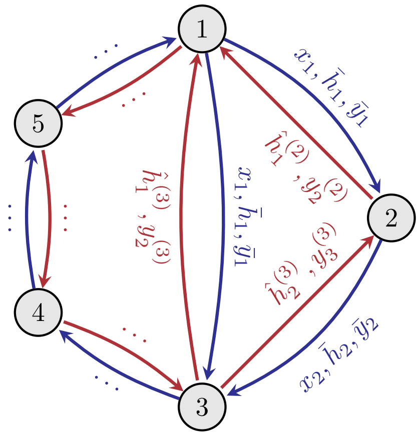

Fig. 1: Graph of a non-fully connected network topology.

$$\phi_i^{(k+1)} = \arg\min_{\phi_i} \left\{ \phi_i^{\mathrm{T}} \mathbf{R}_i^{(k)} \phi_i + \lambda_i^{(k)\mathrm{T}} \left(\phi_i - \gamma_i^{(k)}\right) + \frac{\rho}{2} \|\phi_i - \gamma_i^{(k)}\|_2^2 \right\} \tag{1}$$

$$\gamma_i^{(k+1)} = \arg\min_{\gamma_i} \left\{ \sum_{j \in \mathcal{R}_i} \left(-\lambda_j^{(k)\mathrm{T}} \gamma_i + \frac{\rho}{2} \|\phi_j^{(k+1)} - \gamma_i\|_2^2 \right) \right\} \tag{2}$$

$$\lambda_i^{(k+1)} = \lambda_i^{(k)} + \rho \left(\phi_i^{(k+1)} - \gamma_i^{(k+1)} \right) \tag{3}$$

4. NUMERICAL EVALUATION

5. CONCLUSION

*THANK EU!
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Algorithm 1 The D-BSI algorithm

for $t = 0, 1, 2, ...$ **do**
  for $i \in [M]$ **do**
    Acquire new data vector $x_i^{(t)}$
    for all $j \in \mathcal{T}_i$ **do**
      Send $x_i^{(t)}, \bar{h}_i^{(t)}, \bar{y}_i^{(t)}$ to node j
    end for
    for all $k \in \mathcal{R}_i$ **do**
      Receive $x_k^{(t)}, \bar{h}_k^{(t)}, \bar{y}_k^{(t)}$ from node k
    end for
    Update $\phi_i^{(t+1)} \leftarrow \phi_i^{(t)}$ using (1)
    Update $\gamma_i^{(t+1)} \leftarrow \gamma_i^{(t)}$ using (2)
    Update $\lambda_i^{(t+1)} \leftarrow \lambda_i^{(t)}$ using (3)
    for all $k \in \mathcal{R}_i$ **do**
      Send $\hat{h}_{ki}^{(t)}, y_{ki}^{(t)}$ to node k
    end for
    for all $j \in \mathcal{T}_i$ **do**
      Receive $\hat{h}_{ij}^{(t)}, y_{ij}^{(t)}$ to node j
    end for
  end for
end for