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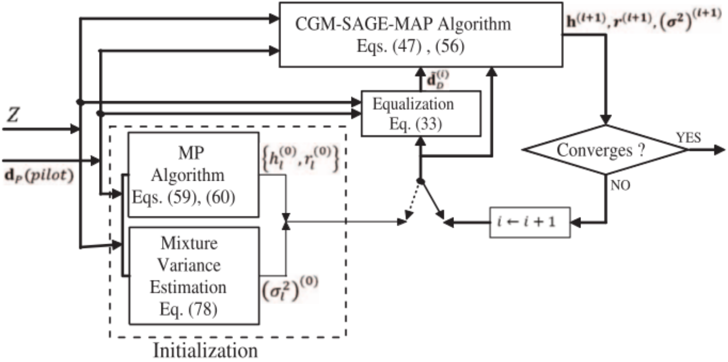
- **Sparse Channel Estimation and Equalization for OFDM-Based Underwater Cooperative Systems With Amplify-and-Forward Relaying**

  Authors: E. Panayirci, H. Senol, M. Uysal, and H. V. Poor

Cascaded system model: $\mathbf{z} = \mathbf{Ah} + \mathbf{V}$
Goal: Estimate unknown parameter $\mathbf{\Phi} = \{\mathbf{h}, \mathbf{r}, \mathbf{v}\}$
Algo:

- update $\mathbf{\Phi}_l = \{h_l, r_l\}$ for $l = 1, 2, .., L$ using CGM-MP-SAGE, keep $\mathbf{\Phi}_{L+1} = \{\mathbf{v}\}$ fixed
- update $\mathbf{\Phi}_{L+1}$ using SAGE, keep $\mathbf{\Phi}_l$ fixed



CGM-MP-SAGE:

E-step:

$$
\begin{aligned}
Q_l(\boldsymbol{\Phi}_l|\boldsymbol{\Phi}^{(i)}) &= \mathbb{E}\{\log\ p(\chi_l, \boldsymbol{\Phi}_l|, \bar{\boldsymbol{\Phi}}_l^{(i)})|\mathbf{Z}, \boldsymbol{\Phi}^{(i)}\} \\
&\sim \mathbb{E}\{\log\ p(\mathbf{X}_l|h_l, r_l, \mathbf{v}, \bar{\boldsymbol{\Phi}}_l^{(i)})|\mathbf{Z}, \bar{\boldsymbol{\Phi}}^{(i)}\} \\
&+ \mathbb{E}\{\log\ p(h_l|v_l)|\mathbf{Z}, \bar{\boldsymbol{\Phi}}^{(i)}\}
\end{aligned}
$$

M-step:

$$
\boldsymbol{\Phi}_l^{(i+1)} = \arg\max_{\boldsymbol{\Phi}_l}\ Q_l(\boldsymbol{\Phi}_l|\boldsymbol{\Phi}^{(i)})
$$

- **A Minorization-Maximization Method for Optimizing Sum Rate in the Downlink of Non-Orthogonal Multiple Access Systems**

  Authors: M. F. Hanif, Z. Ding, T. Ratnarajah, and G. K. Karagiannidis

Optimization problem:

$R_{sum} = \sum_{k=1}^{N-1} \log_2 \left(1 + \min(\text{SINR}_k^k, ..., \text{SINR}_N^k)\right) + \log_2 \left(1 + \frac{|\mathbf{h}_N^H \mathbf{w}_N|^2}{\sigma^2}\right)$

$$\begin{aligned} \underset{\mathbf{w}_i}{\text{maximise}} \quad & R_{sum} \\ \text{s.t.} \quad & |\mathbf{h}_k^H \mathbf{w}_1|^2 \geq ...|\mathbf{h}_k^H \mathbf{w}_{k-1}|^2 \geq |\mathbf{h}_k^H \mathbf{w}_k|^2 \geq \\ & |\mathbf{h}_k^H \mathbf{w}_{k+1}|^2 ... \geq |\mathbf{h}_k^H \mathbf{w}_N|^2, \\ & 1 \leq k \leq N \\ & \sum_{i=1}^{N} ||\mathbf{w}_i||_2^2 \leq P_{th} \end{aligned}$$

Proposed iterative solution:

given randomly generated Λ^0 feasible to original opt-prob.,
$t := 0$
repeat: 1. Solve equivalent form of original opt-prob.
2. set $\Lambda^{t+1} = \Lambda^t$
3. update t := t+1
until converges

where, $\Lambda^t = [w_k^t, r_k^t, v_j^t, \theta_{k,k}^t, \theta_{j,k}^t, \theta_{N,N}^t, \Phi_{k,m}^t]$

- **Parallel Two-Way Relaying in Cooperative OFDMA Cellular Systems**

  Authors: S. Jin and L. Ping

Goal: Maximize the throughput

$$\bar{R}_{PTWR-OFDMA} = \beta\bar{R}_{direct} + (1 - \beta\bar{R}_{indirect})$$

Under power constraints

$$\max : \bar{R}_{indirect} = \frac{1}{2}.(\log_2(1+\gamma_{BS}) + \log_2(1+\gamma_{FN}))$$

$$\text{s.t. } : P_{BS} + P_{FN} + \sum_{k=1}^{K'} P_{NN\ k} \leq P_{sum}$$

Maximum sum rate is achieved when: $\gamma_{BS} = \gamma_{FN}$
and for the optimal solution $P_{sum,NNs} = \sum_{k=1}^{K'} P_{NN\ k} = \frac{1}{2}P_{sum}$

Asymptotically Optimal β and Average Achievable Rate:

$$\beta^{opt} \approx \beta^{app} \triangleq \frac{1}{\ln K}, \text{ and}$$

$$\bar{R}_{PTWR-OFDMA} = (\ln K - 1)/\ln 2 + o(\ln K)$$

$$\text{Average assisting power per NN, } \bar{P}_{assisting} = (\ln K - 1)P$$

Conclusion: Throughput increases in the order of $\ln K$ compared to $\ln \ln K$ in conventional OFDMA

Some other papers:

- Learning in an Uncertain World: MIMO Covariance Matrix Optimization With Imperfect Feedback
  -P. Mertikopoulos and A. L. Moustakas
- Outlier-Robust Greedy Pursuit Algorithms in l_p -Space for Sparse Approximation
  -W.-J. Zeng, H. C. So, and X. Jiang
- An Improved Algebraic Solution for Moving Target Localization in Noncoherent MIMO Radar Systems
  -H. Yang and J. Chun