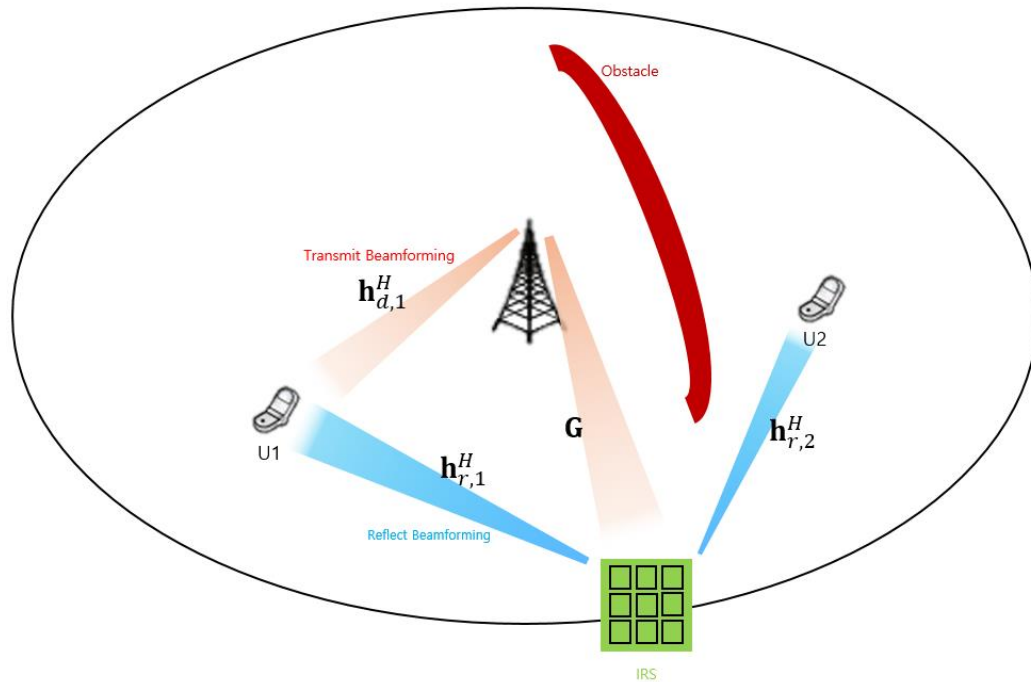


제목: mmWave 대역 다중 사용자 MISO 시스템에서 IRS를 통한 Sum Rate 최적화 연구

저자: 우정현, 엄수빈, 이홍주, 이인규

소속: 고려대학교 통신 및 지능시스템 연구실

요약:



<System Assumption>

- ① Downlink
- ② Single Cell
- ③ Multi-antenna BS
- ④ 2 Single-antenna users
- ⑤ CSI is perfectly known at the BS

$$\boldsymbol{\theta} = [\theta_1, \dots, \theta_N]^H$$

$$\boldsymbol{\Theta} = \text{diag}(e^{j\theta_1}, \dots, e^{j\theta_N})$$

\mathbf{w} : Tx beamforming vector $\in \mathbb{C}^{M \times 1}$

$$y_1 = (\mathbf{h}_{r,1}^H \boldsymbol{\Theta} \mathbf{G} + \mathbf{h}_{d,1}^H) \mathbf{w} \sum_{k=1}^2 \sqrt{p_k} s_k + n_1$$

$$y_2 = (\mathbf{h}_{r,2}^H \boldsymbol{\Theta} \mathbf{G}) \mathbf{w} \sum_{k=1}^2 \sqrt{p_k} s_k + n_2$$

<Problem Formulation>

$$\max_{\{p_k\}, \mathbf{w}, \boldsymbol{\theta}} R_{\text{sum}}$$

$$\text{s.t. } C_1: R_k \geq R_{\min}, \forall k,$$

$$C_2: p_k \geq 0, \forall k,$$

$$C_3: \sum_{k=1}^2 p_k \leq P,$$

$$C_4: |[\mathbf{w}]_m| = \frac{1}{\sqrt{M}}, \forall m,$$

$$C_5: 0 \leq \theta_n \leq 2\pi, \forall n.$$

where C_1 is the minimum rate constraint.
 C_2 indicates that the power allocation to each user should be positive.
 C_3 is the total transmission power constraint that is no more than P .
 C_4 is the constant modulus constraint.
 C_5 indicates the phase shift range.

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