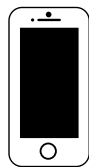


Phase I: forward propagation of the signal

$$\mathbf{x}_k \in \mathbb{C}^N$$

$$r_l \in \mathbb{C}$$



UE  $k$



AP  $l$



CPU

$$\left( \mathbf{v}_l \frac{\partial J}{\partial r_l^*} \right)^* \in \mathbb{C}^M$$

$$[\mathbf{W}(l, :) \cdot \nabla_{\hat{\mathbf{s}}} f]^* \in \mathbb{C}$$

Phase II: backpropagation of the derivatives