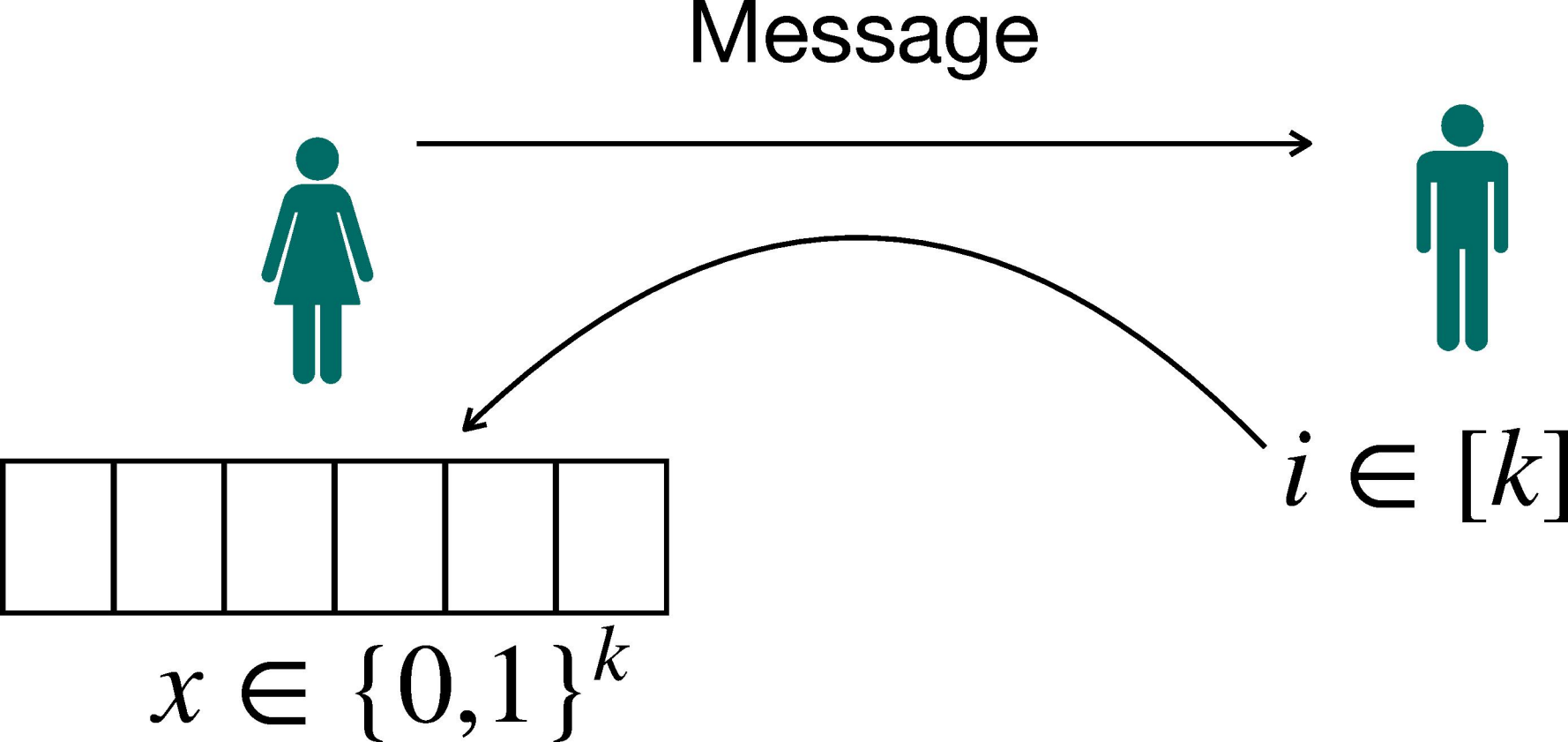

Message
$i \in [k]$
$x \in \{0,1\}^k$