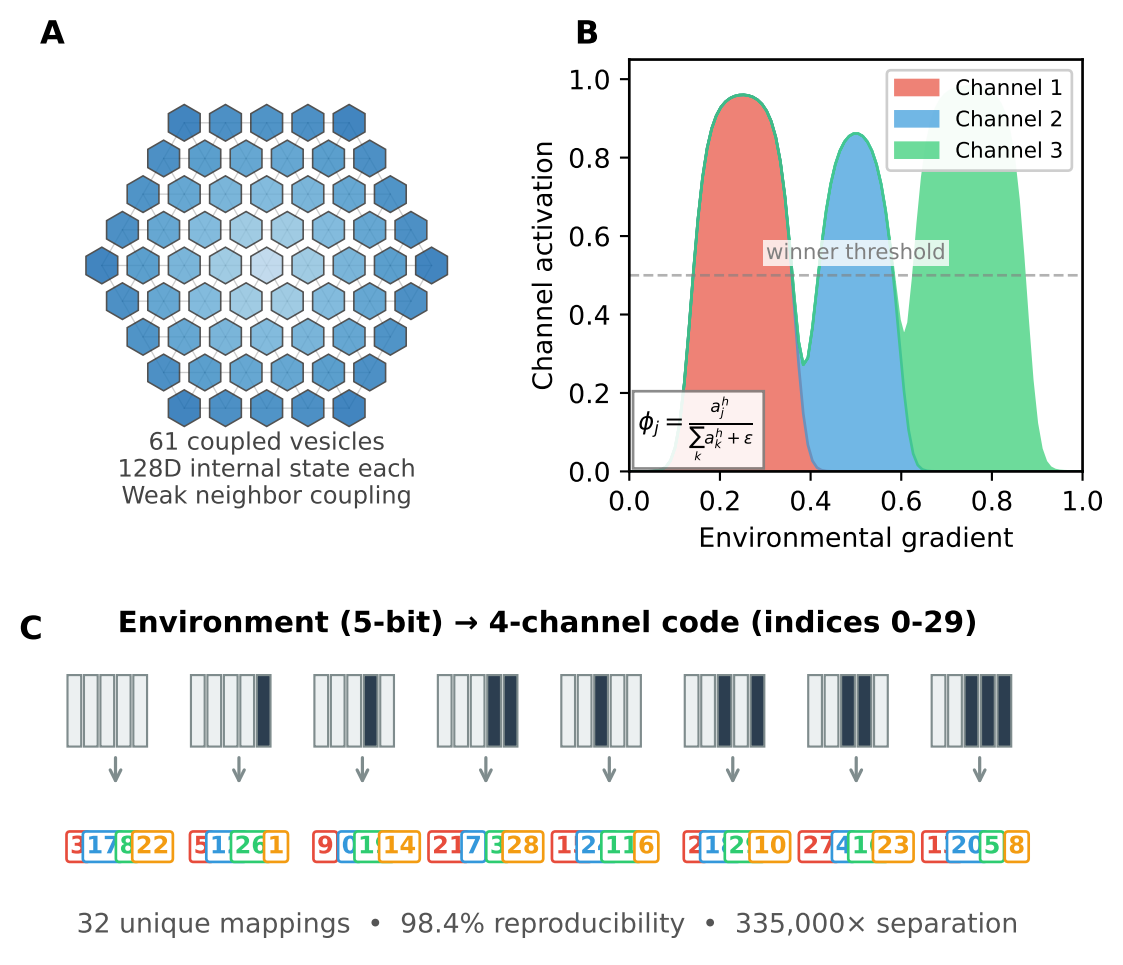
A
61 coupled vesicles
128D internal state each
Weak neighbor coupling
B
Channel activation
Environmental gradient
Channel 1
Channel 2
Channel 3
winner threshold
$\phi_j = \frac{a_j^h}{\sum_k a_k^h + \varepsilon}$
C
Environment (5-bit) → 4-channel code (indices 0-29)
32 unique mappings • 98.4% reproducibility • 335,000× separation