V3 Architecture: Sparse Encoding + Ancilla Measurement

The Winning Configuration (+1.22 Training Effect)

Key Properties:
• Sparse: 1 feature/qubit
• Scaling: [0.1, π-0.1]
• Parameters: 21 (7×3)
• Loss: BCE

q_0 (v1[0])
q_1 (v1[1])
q_2 (v1[2])
q_3 (v2[0])
q_4 (v2[1])
q_5 (v2[2])
q_6 (Ancilla)

$P(|1\rangle)$ = Dissimilarity

Encoding (RY)
Layer 1 (RY)
Entangle (CX)
Layer 2 (RY)

■ v1 encoding (3 qubits)
■ v2 encoding (3 qubits)
■ Trainable layers (θ)
■ Ancilla (output)