Hybrid Quantum-Nyström Flowchart

LEFT COLUMN (START) **CENTER COLUMN (QUANTUM)** **RIGHT COLUMN (END)**

Start

Input Classical Dataset
Breast Cancer Wisconsin

Normalization & Preprocessing

Feature Selection & Dim. Reduction

Are features suitable for quantum?

No (Reset Features)

Representative Subset Selection
(Nyström Sampling)

Is subset size sufficient?

No (Increase m)

Yes

Yes

Quantum Processing Section

Quantum Data Encoding
(Angle Encoding)

Quantum Feature Map Circuit Design

Quantum Kernel Calculation
(State Overlap)

No

Is quantum kernel stable?

Yes

Kernel Matrix Approximation
via Nyström Method

Kernel-based Classical Learning
(e.g., SVM)

Model Performance Evaluation

Is performance acceptable?

No (Review)

Yes

End