Working Note CG1129250: Path Probability Algorithm

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December 3, 2024

Abstract

This document describes the path probability algorithm used in FQAM.

1 Introduction

The introduction section provides an overview of the path probability algorithm.

2 Methodology - the algorithm

Transition lines are all

On input of the the operator being applied in the current time step, we want to generate a sort of adjency matrix which contains the probability amplitudes associated with the total probability amplitude of each state in the current

The algorithm below A is the matrix representation of operator A, b is a vector representing the current state vector, and C is the resulting probability adjency matrix.

3 Results

This section presents the results obtained from the path probability algorithm.

4 Conclusion

The conclusion summarizes the findings and implications of the path probability algorithm.

Algorithm: $[C] :=$ GEN_PATH_PROBILITY_MATRIX_UNB(A, b, C)

$$A \rightarrow \left(\begin{array}{c|c} A_L & A_R \end{array} \right) \; b \rightarrow \left(\begin{array}{c} b_T \\ \hline b_B \end{array} \right), \; C \rightarrow \left(\begin{array}{c} C_T \\ \hline C_B \end{array} \right)$$

where A_L has 0 columns, C_T has 0 rows, b_T has no elements

while $n(A_L) < n(A)$ do

$$\left(\begin{array}{c|c} A_L & A_R \end{array} \right) \rightarrow \left(\begin{array}{c|cc} A_0 & a_1 & A_2 \end{array} \right), \left(\begin{array}{c} b_T \\ \hline b_B \end{array} \right) \rightarrow \left(\begin{array}{c} b_0 \\ \hline \beta_1 \\ \hline b_2 \end{array} \right), \left(\begin{array}{c} C_T \\ \hline C_B \end{array} \right) \rightarrow \left(\begin{array}{c} C_0 \\ \hline c_1^T \\ \hline C_2 \end{array} \right)$$

where a_1 has 1 column, c_1 has 1 row

$$c_1 = \beta a_1 + c_1$$

$$A \rightarrow \left(\begin{array}{c|c} A_L & A_R \end{array} \right) \leftarrow \left(\begin{array}{cc|c} A_0 & a_1 & A_2 \end{array} \right), \left(\begin{array}{c} b_T \\ \hline b_B \end{array} \right) \leftarrow \left(\begin{array}{c} b_0 \\ \hline \beta_1 \\ \hline b_2 \end{array} \right), \left(\begin{array}{c} C_T \\ \hline C_B \end{array} \right) \leftarrow \left(\begin{array}{c} C_0 \\ \hline c_1^T \\ \hline C_2 \end{array} \right)$$

endwhile

Figure 1: Algorithm Diagram