

GPU

QuEST_internal.h

QuESTAssert
exitWithError
findProbabilityOfZero
measureInZero
phaseGate

hashString
validateAlphaBeta
validateMatrixIsUnitary
validateUnitVector

QuEST_env_localGPU.cu

calcTotalProbability
closeQuESTEnv
collapseToOutcome
compactUnitary
controlledCompactUnitary
controlledNot
controlledPhaseGate
controlledUnitary
createMultiQubit
destroyMultiQubit
findProbabilityOfOutcome
getEnvironmentString
getImagAmpEl
getRealAmpEl
hadamard
initClassicalState
initQuESTEnv
initStatePlus
initStateZero
measure
measureWithStats
multiControlledPhaseGate
multiControlledUnitary
reportQuESTEnv
reportStateToScreen
sigmaX
sigmaY
syncQuESTEnv
syncQuESTSuccess
unitary

QuESTAssert
exitWithError
findProbabilityOfZero
measureInZero
phaseGate

compareStates
initStateDebug
initStateOfSingleQubit
initializeStateFromSingleFile

extractBit

GPUExists
collapseToOutcomeKernel
compactUnitaryKernel
controlledCompactUnitaryKernel
controlledNotKernel
controlledPhaseGateKernel
controlledUnitaryKernel
copySharedReduceBlock
copyStateFromGPU
copyStateToGPU
findProbabilityOfZeroKernel
getNumReductionLevels
hadamardKernel
initClassicalStateKernel
initStateDebugKernel
initStateOfSingleQubitKernel
initStatePlusKernel
initStateZeroKernel
log2Int
measureInZeroKernel
multiControlledPhaseGateKernel
multiControlledUnitaryKernel
phaseGateKernel
reduceBlock
sigmaXKernel
sigmaYKernel
swapDouble
unitaryKernel

* Aren't GPU specific **AND**
* Aren't used by QuEST.cpp

API

QuEST.h

calcTotalProbability
closeQuESTEnv
collapseToOutcome
compactUnitary
controlledCompactUnitary
controlledNot
controlledPhaseGate
controlledRotateAroundAxis
controlledRotateX
controlledRotateY
controlledRotateZ
getNumAmps
getNumQubits
getProbEl
reportMultiQubitParams
reportState
rotateAroundAxis
rotateX
rotateY
rotateZ
controlledUnitary
createMultiQubit
destroyMultiQubit
findProbabilityOfOutcome
getEnvironmentString
getImagAmpEl
getNumAmps
getNumQubits
getProbEl
getRealAmpEl
hadamard
initClassicalState
initQuESTEnv
initStatePlus
initStateZero
measure
measureWithStats
multiControlledPhaseGate
multiControlledUnitary
reportMultiQubitParams
reportQuESTEnv
reportState
reportStateToScreen
rotateAroundAxis
rotateX
rotateY
rotateZ
sGate
seedQuEST
seedQuESTDefault
sigmaX
sigmaY
sigmaZ
syncQuESTEnv
syncQuESTSuccess
tGate
unitary

QuEST_debug.h

compareStates
initStateDebug
initStateOfSingleQubit
initializeStateFromSingleFile
reportNodeList

* Aren't used by QuEST_env_localGPU.cu

QuEST.c

controlledPhaseGate
controlledRotateAroundAxis
controlledRotateX
controlledRotateY
controlledRotateZ
createMultiQubit
destroyMultiQubit
getEnvironmentString
getNumAmps
getNumQubits
getProbEl
initClassicalState
initStatePlus
initStateZero
multiControlledPhaseGate
reportMultiQubitParams
reportState
reportStateToScreen
rotateAroundAxis
rotateX
rotateY
rotateZ
sGate
seedQuEST
seedQuESTDefault
sigmaZ
tGate

collapseToOutcomeDistributedRenorm
collapseToOutcomeDistributedSetZero
collapseToOutcomeLocal
compactUnitaryDistributed
compactUnitaryLocal
controlledCompactUnitaryDistributed
controlledCompactUnitaryLocal
controlledNotDistributed
controlledNotLocal
controlledUnitaryDistributed
controlledUnitaryLocal
findProbabilityOfZeroDistributed
findProbabilityOfZeroLocal
hadamardDistributed
hadamardLocal
hashString
multiControlledUnitaryDistributed
multiControlledUnitaryLocal
phaseGateDistributed
phaseGateLocal
sigmaXDistributed
sigmaXLocal
sigmaYDistributed
sigmaYLocal
unitaryDistributed
unitaryLocal
validateAlphaBeta
validateMatrixIsUnitary
validateUnitVector

compareStates
initStateDebug
initStateOfSingleQubit
initializeStateFromSingleFile

extractBit

Prototyped:

extractBit

QuEST_env_local.c

calcTotalProbability
closeQuESTEnv
collapseToOutcome
compactUnitary
controlledCompactUnitary
controlledNot
controlledUnitary
findProbabilityOfOutcome
getImagAmpEl
getRealAmpEl
hadamard
initQuESTEnv
measure
measureWithStats
multiControlledUnitary
reportQuESTEnv
sigmaX
sigmaY
syncQuESTEnv
syncQuESTSuccess
Unitary

QuESTAssert
exitWithError
phaseGate

reportNodeList

QuEST_env_mpi.c

calcTotalProbability
closeQuESTEnv
collapseToOutcome
compactUnitary
controlledCompactUnitary
controlledNot
controlledUnitary
findProbabilityOfOutcome
getImagAmpEl
getRealAmpEl
hadamard
initQuESTEnv
measure
measureWithStats
multiControlledUnitary
reportQuESTEnv
sigmaX
sigmaY
syncQuESTEnv
syncQuESTSuccess
Unitary

QuESTAssert
exitWithError
phaseGate

reportNodeList

chunksIsUpper
getChunkIdFromIndex
getChunkPairId
getRotAngle
halfMatrixBlockFitsInChunk
isChunkToSkipInFindPZero

exchangeStateVectors
getRotAngleFromUnitaryMatrix

Prototyped:

chunksIsUpper
getChunkIdFromIndex
getChunkPairId
getRotAngle
halfMatrixBlockFitsInChunk
isChunkToSkipInFindPZero

QuEST_internal.h

collapseToOutcomeDistributedRenorm
collapseToOutcomeDistributedSetZero
collapseToOutcomeLocal
compactUnitaryDistributed
compactUnitaryLocal
controlledCompactUnitaryDistributed
controlledCompactUnitaryLocal
controlledNotDistributed
controlledNotLocal
controlledUnitaryDistributed
controlledUnitaryLocal
findProbabilityOfZeroDistributed
findProbabilityOfZeroLocal
hadamardDistributed
hadamardLocal
hashString
multiControlledUnitaryDistributed
multiControlledUnitaryLocal
phaseGateDistributed
phaseGateLocal
sigmaXDistributed
sigmaXLocal
sigmaYDistributed
sigmaYLocal
unitaryDistributed
unitaryLocal
validateAlphaBeta
validateMatrixIsUnitary
validateUnitVector

QuESTAssert
exitWithError
phaseGate

OLD
STRUCTURE

| GPU |
|---|
| <div>QuEST_env_localGPU.cu</div> <div>calcTotalProbability closeQuESTEnv collapseToOutcome compactUnitary controlledCompactUnitary controlledNot controlledPhaseGate controlledUnitary createMultiQubit destroyMultiQubit findProbabilityOfOutcome getEnvironmentString getImagAmpEl getRealAmpEl hadamard initClassicalState initQuESTEnv initStatePlus initStateZero measure measureWithStats multiControlledPhaseGate multiControlledUnitary reportQuESTEnv reportStateToScreen sigmaX sigmaY syncQuESTEnv syncQuESTSuccess unitary</div> <div>compareStates initStateDebug initStateOfSingleQubit initializeStateFromSingleFile</div> <div>extractBit</div> <div>GPUExists collapseToOutcomeKernel compactUnitaryKernel controlledCompactUnitaryKernel controlledNotKernel controlledPhaseGateKernel controlledUnitaryKernel copySharedReduceBlock copyStateFromGPU copyStateToGPU findProbabilityOfZeroKernel getNumReductionLevels hadamardKernel initClassicalStateKernel initStateDebugKernel initStateOfSingleQubitKernel initStatePlusKernel initStateZeroKernel log2Int measureInZeroKernel multiControlledPhaseGateKernel multiControlledUnitaryKernel phaseGateKernel reduceBlock sigmaXKernel sigmaYKernel swapDouble unitaryKernel</div> |

| common |
|---|
| <div>QuEST_newinternal.h</div> <div>QuESTAssert exitWithError hashString phaseGate validateAlphaBeta validateMatrixIsUnitary validadateUnitVector</div> <div>QuEST_common.c</div> <div>QuESTAssert controlledRotateAroundAxis controlledRotateX controlledRotateY controlledRotateZ exitWithError getNumAmps getNumQubits getProbEl hashString reportMultiQubitParams reportState rotateAroundAxis rotateX rotateY rotateZ sGate seedQuEST seedQuESTDefault sigmaZ tGate validateAlphaBeta validateMatrixIsUnitary validateUnitVector</div> |

| API |
|--|
| <div>QuEST.h</div> <div>calcTotalProbability closeQuESTEnv collapseToOutcome compactUnitary controlledCompactUnitary controlledNot controlledPhaseGate controlledRotateAroundAxis controlledRotateX controlledRotateY controlledRotateZ controlledUnitary createMultiQubit destroyMultiQubit findProbabilityOfOutcome getEnvironmentString getImagAmpEl getNumAmps getNumQubits getProbEl getRealAmpEl hadamard initClassicalState initQuESTEnv initStatePlus initStateZero measure measureWithStats multiControlledPhaseGate multiControlledUnitary reportMultiQubitParams reportQuESTEnv reportState reportStateToScreen rotateAroundAxis rotateX rotateY rotateZ sGate seedQuEST seedQuESTDefault sigmaX sigmaY sigmaZ syncQuESTEnv syncQuESTSuccess tGate unitary</div> <div>QuEST_debug.h</div> <div>compareStates initStateDebug initStateOfSingleQubit initializeStateFromSingleFile reportNodeList</div> |

| CPU & MPI |
|---|
| <div>QuEST.c</div> <div>controlledPhaseGate createMultiQubit destroyMultiQubit getEnvironmentString initClassicalState initStatePlus initStateZero multiControlledPhaseGate reportStateToScreen</div> <div>collapseToOutcomeDistributedRenorm collapseToOutcomeDistributedSetZero collapseToOutcomeLocal compactUnitaryDistributed compactUnitaryLocal controlledCompactUnitaryDistributed controlledCompactUnitaryLocal controlledNotDistributed controlledNotLocal controlledUnitaryDistributed controlledUnitaryLocal findProbabilityOfZeroDistributed findProbabilityOfZeroLocal hadamardDistributed hadamardLocal multiControlledUnitaryDistributed multiControlledUnitaryLocal phaseGateDistributed phaseGateLocal sigmaXDistributed sigmaXLocal sigmaYDistributed sigmaYLocal unitaryDistributed unitaryLocal</div> <div>compareStates initStateDebug initStateOfSingleQubit initializeStateFromSingleFile</div> <div>extractBit</div> <div>Prototyped:<div>extractBit</div></div> |

| QuEST_env_local.c |
|--|
| calcTotalProbability closeQuESTEnv collapseToOutcome compactUnitary controlledCompactUnitary controlledNot controlledUnitary findProbabilityOfOutcome getImagAmpEl getRealAmpEl hadamard initQuESTEnv measure measureWithStats multiControlledUnitary reportQuESTEnv sigmaX sigmaY syncQuESTEnv syncQuESTSuccess unitary |
| reportNodeList |

| QuEST_env_mpi.c |
|--|
| calcTotalProbability closeQuESTEnv collapseToOutcome compactUnitary controlledCompactUnitary controlledNot controlledUnitary findProbabilityOfOutcome getImagAmpEl getRealAmpEl hadamard initQuESTEnv measure measureWithStats multiControlledUnitary reportQuESTEnv sigmaX sigmaY syncQuESTEnv syncQuESTSuccess unitary |
| reportNodeList |
| chunksUpper getChunkIdFromIndex getChunkPairId getRotAngle halfMatrixBlockFitsInChunk isChunkToSkipInFindPZero |
| exchangeStateVectors getRotAngleFromUnitaryMatrix |
| Prototyped: <div>chunksUpper getChunkIdFromIndex getChunkPairId getRotAngle halfMatrixBlockFitsInChunk isChunkToSkipInFindPZero</div> |

| QuEST_internal.h |
|---|
| collapseToOutcomeDistributedRenorm collapseToOutcomeDistributedSetZero collapseToOutcomeLocal compactUnitaryDistributed compactUnitaryLocal controlledCompactUnitaryDistributed controlledCompactUnitaryLocal controlledNotDistributed controlledNotLocal controlledUnitaryDistributed controlledUnitaryLocal findProbabilityOfZeroDistributed findProbabilityOfZeroLocal hadamardDistributed hadamardLocal multiControlledUnitaryDistributed multiControlledUnitaryLocal phaseGateDistributed phaseGateLocal sigmaXDistributed sigmaXLocal sigmaYDistributed sigmaYLocal unitaryDistributed unitaryLocal |

NOT UP TO DATE!!