**Computation Niche model simulation code**

**List of Functions**

|  |  |  |  |
| --- | --- | --- | --- |
| **Function Name** | **Input functions** | **Dependent simulation** | **Description** |
|  |  |  |  |
| calcInputDistributionv5.m |  | CN, CN unconstrained | Determine the cumulative input received at a membrane automata’s incoming edges |
| checkDuplicates.m |  | CN unconstrained |  |
| checkInteraction.m |  | CN unconstrained | Check whether the interaction of two automata generates a valid automaton |
| checkIsomorphic.m |  | CN unconstrained | Check that a newly produced automata is isomorphic |
| checkLanguageCoverage.m |  | CN unconstrained |  |
| checkMachineDim.m |  | CN unconstrained | Count the number of states in an automata (machine) |
| checkNullTypes.m |  |  |  |
| checkStronglyConnected.m |  |  |  |
| checkUnifilarity.m |  |  |  |
| checkWaitingList.m |  |  |  |
| compareLists.m |  |  |  |
| composeMachinesRevised.m |  |  |  |
| convertL2D.m |  |  |  |
| convertList2Y.m |  |  | Converts an automata description from the list format (e.g. [1 1 1]) to an outgoing probability distribution (e.g. [1 0]) |
| convertPartition2List.m |  |  |  |
| convertPopCell2Matrix.m |  |  | Converts the ‘popDynamics’ cell array to a |T| x Z matrix where Z is the number of iterations of the simulation |
| createSigmaSet.m |  |  | Creates four binary vectors each of length |T|. Each vector represents a symbol pair ‘0|0’,’0|1’,’1|0’,’1|1’ and each entry in the vector with a ‘1’ represents that the automata type Ti has a transition of that type. |
| extractMachine.m |  |  |  |
| findList.m |  |  |  |
| findPartitionSet.m |  |  |  |
| getNextState.m |  |  |  |
| initCNv2.m |  |  |  |
| initialiseCY.m |  |  |  |
| inverseList.m |  |  |  |
| minList.m |  |  |  |
| mirrorList.m |  |  |  |
| nkCheck.m |  |  |  |
| performCompositionRevised.m |  |  |  |
| produceMachinev5\_unconstrained.m |  |  |  |
| produceMachinev5.m |  |  |  |
| pruneTc.m |  |  |  |
| rebuildCNv5.m |  |  |  |
| reLabel.m |  |  |  |
| removeDuplicates.m |  |  |  |
| seedAutomata.mat |  |  |  |
| setActive.m |  |  |  |
| stateTransition.m |  |  |  |
| updateCNv5\_unconstrained.m |  |  |  |
| updateCNv5.m |  |  |  |