Introduction of Flexsim

W. M. Song 桑慧敏
Tsing Hua Univ. 清華大學

2015.10.21

Introduction of FlexSim

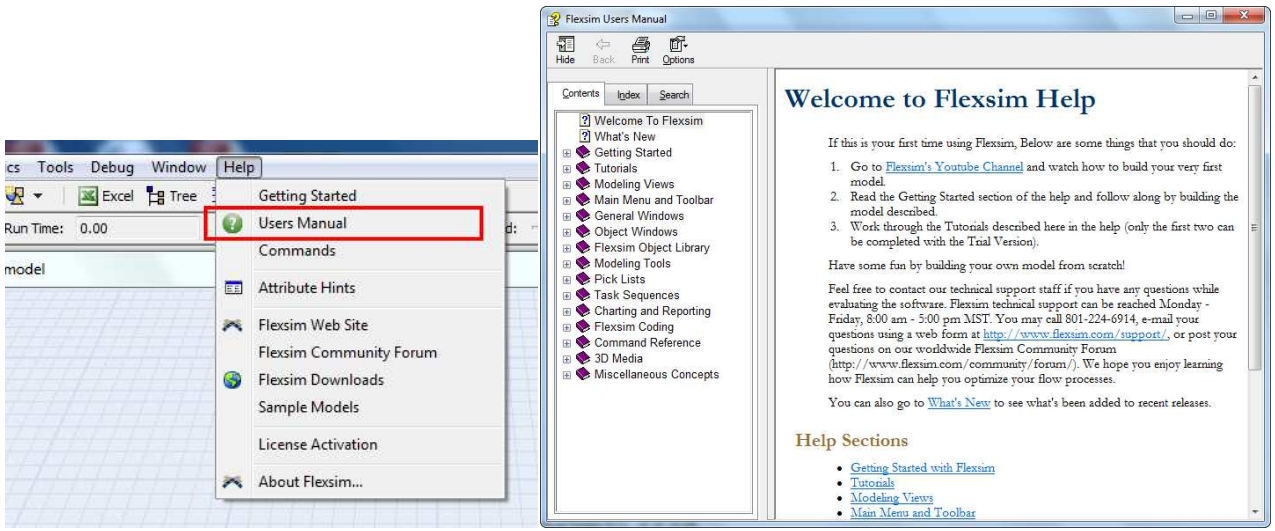
- FlexSim is a discrete event simulation software developed by FlexSim Software Products, Inc.
- FlexSim 1.0 was released in February 2003.
- The most recent of FlexSim release is version 7
- FlexSim Health Care was later developed for healthcare simulation.
- The FlexSim Software Products, Inc. headquarters is located in Orem, Utah, U.S.A.
- Trial Version "http://www.flexsim.com/" (Note: Less than 20 objects, Random seed not available)
- Education Use only: help > licence activaction > licence service > use concurrent licensing >140.114.53.5
- What is discrete event simulation?

Flexsim Learning Platforms

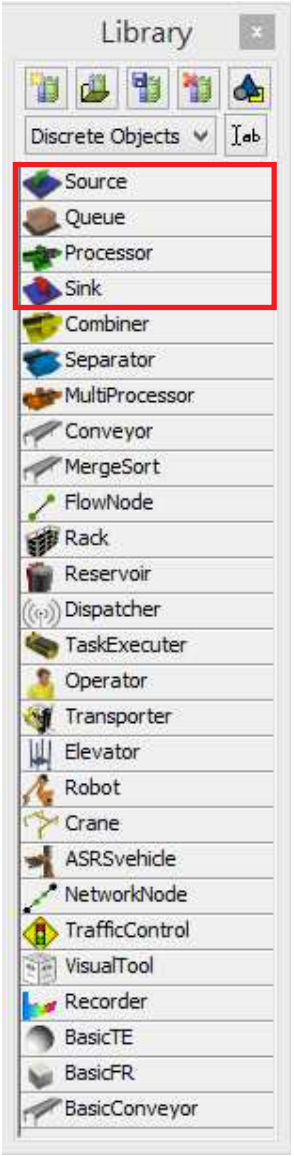
- Flexsim in USA

  `http://www.flexsim.com/community/forum/index.php`
- Flexsim in Asia (簡體字)

  `http://www.flexsim.asia/`
- FlexSim Users Manual in the toolbar

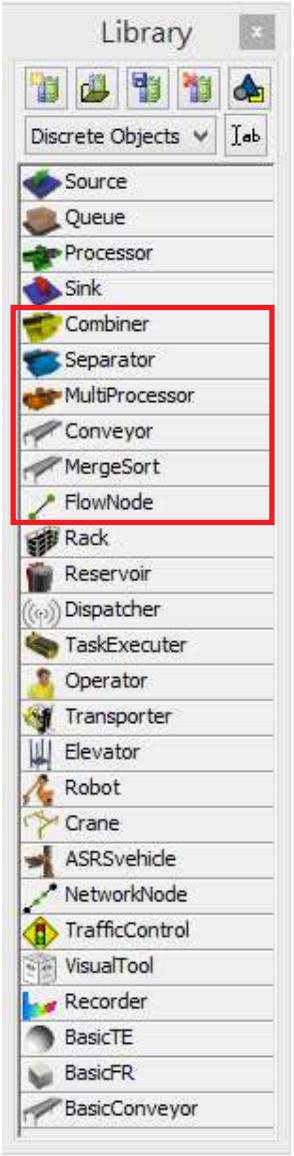


FlexSim Discrete Objects - 1



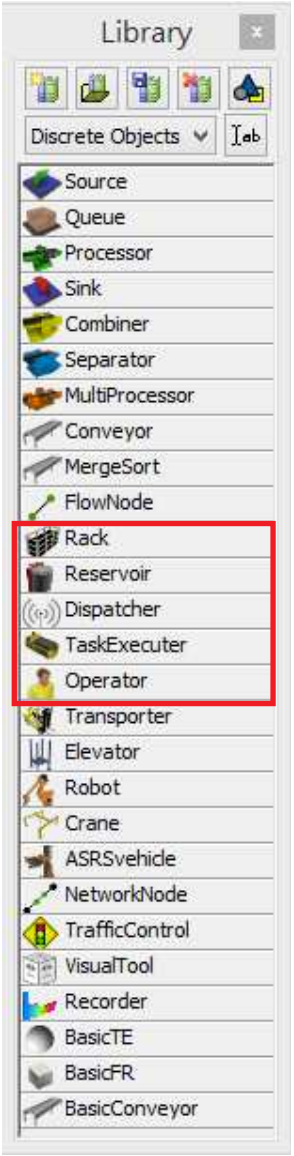
- Source: create the flowitems
- Queue: store flowitems
- Processor: process flowitems
- Sink: destroy flowitems

FlexSim Discrete Objects - 2



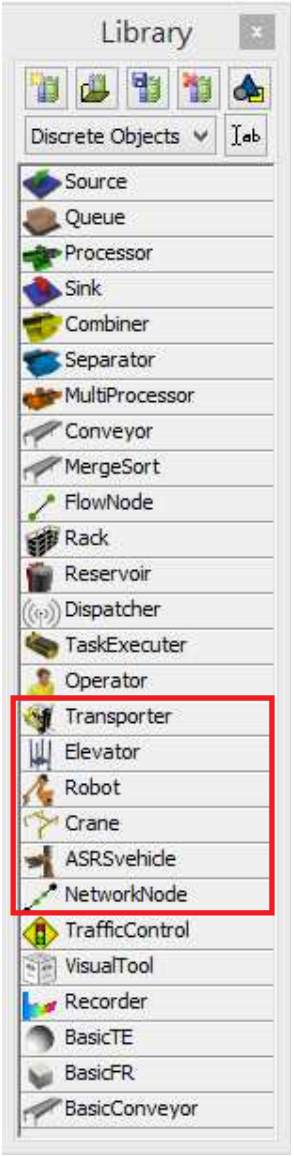
- Combiner: group multiple flowitems together
- Separator: separate a flowitem into multiple parts
- MultiProcessor: simulate the processing of flowitems in sequentially ordered operations
- Conveyor: move flowitems along a set path
- MergeSort: non-accumulating conveyor that allowsto have multiple input positions and multiple output positions along the conveyor
- FlowNode: move flowitems from one location to another with time being consumed

FlexSim Discrete Objects - 3



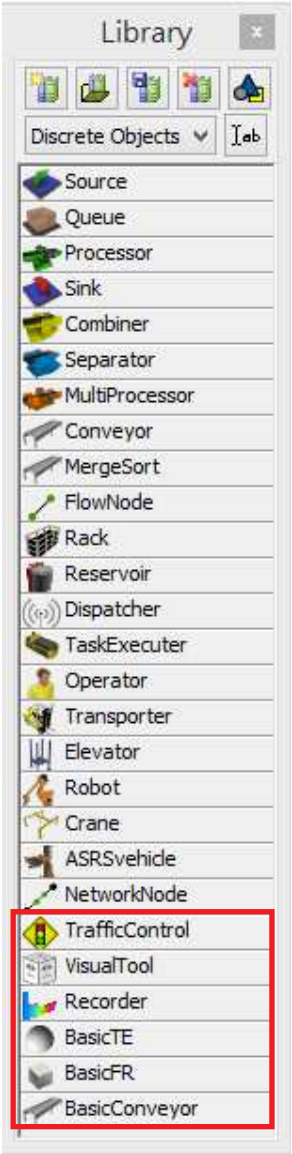
- Rack: store flowitems as if they were in a warehouse rack
- Reservoir: store flowitems as if they were in a fluid reservoir or tank
- Dispatcher: control a group of transporters or operators
- TaskExecuter: the top level class for Operators, Transporters, ASRSvehicles, Cranes and other mobile resources
- Operator: can be called by objects to be utilized during setup, processing or repair time

FlexSim Discrete Objects - 4



- Transporter: used mainly to carry flowitems from one object to another
- Elevator: a special type of transport that moves flowitems up and down
- Robot: a special transport that lifts flowitems from their starting locations and places them at their ending locations
- Crane: similar functionality to the transporter but with a modified graphic
- ASRSvehicle: a special type of transport specifically designed to work with racks
- NetworkNode: define a network of paths that transporters and operators follow

FlexSim Discrete Objects - 5



- TrafficControl: control traffic in a given area of a travel network
- VisualTool: used to decorate the model space with props, scenery, text, and presentation slides in order to give the model a more realistic appearance
- Recorder: record and/or display information graphically
- BasicTE: a TaskExecuter that is meant for developers to create user libraries
- BasicFR: a FixedResource that is designed to be customized into a user library object
- BasicConveyor: a conveyor that allows flowitems to move along the conveyor according to logic that is defined by the user

Mind-Map of Basic Objects of Flexsim

Open Mind-Map for Source, Queue, Processor, and Sink

Mind-Map of Experimenter and Dashboard

Open Mind-Map for Experimenter and Dashboard

Data Types

Data Types

- int: integer (整數)
- double: real value (實數)
- string: (字串)
- treenode: (Flexsim 特有的 Data Type)

Data Type: Examples

- int i-row; int j-column
- double enter-queue-time; double left-queue-time
- string labelname = ”enter-queue-time”
- treenode treenode involved = item

Flexsim Functions

Flexsim Basic Functions

- getoutput(current)
- getinput(current)
- getlabelnum(item,"labelname")
- setlabelnum(item,"labelname",time())
- gettablenum("tablename", i-row, j-column)
- settablenum("tablename", i-row, j-column, enter-queue-time)

Flexsim Functions

Recall help > Commands

Flexsim Functions about treenodes

- inobject(current,1)
- node("/Processor3",model())
- setnodenum(spatialsx(current),10)
- getnodenum(spatialsx(current))
- setnodenum(rank(variables(centerobject(current,1)),6), 5)
- getnodenum(rank(variables(centerobject(current,1)),6))
- setnodenum(label(item, "XRay_Label"), 1)
- getnodenum(label(item, "XRay_Label"))
- label(item, "XRay_Label")