In this research, we propose a networked conveyoring system which consists of multiple arrays of cells as shown in Figure 1 and figure 2. Each cell is a wheel driven by a two degree-of-freedom mechanism. The direction and velocity of cell are controlled based on the concept of hybrid control under a distributed network. Each cell has its own controller under a subsumption architecture for low-level control. A cell communicates with its four neighboring cells to manipulate a targeted object towards its desired position. The high-level control assigns a desired position and direction of the object to each cell. The path of each object is then generated by many supporting cells. Moreover, the networked conveyoring system can handle multiple objects simultaneously.

The networked conveyoring system has several advantages over conveyor belts and conventional robot manipulators. It provides simultaneous transportation of multiple objects on individual trajectory. These include feeding, orientating, sorting, separating, and arranging objects.

To study the networked conveyoring system, a GUI-based simulator of networked conveyoring system is constructed. This simulator is developed under the Windows-based operating system using the Microsoft Visual C++.

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