

A New Approach to Approximate the Collision Probability in an Automated Production Line

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Flat Panel Displays (FPDs) are manufactured through many different processing equipments arranged sequentially in a line. Although the constant inter-arrival time (i. e., the tact time) of glass substrates in the line should be kept as short as possible, the collision probability between glass substrates increases as the time becomes shorter. Since the glass substrate is expensive and fragile, the collision should be avoided. In this paper, we give a simpler expression of the collision probability by a new approximation approach, which enables us to easily computer numerical values of the collision probability over a wider range of parameter values. We also carry out some simulations to evaluate the exact probabilities and confirm that our approximation approach yields reasonable results compared to the simulated results.