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Pin Count Aware Volumetric Error Detection in Arbitrary Microfluidic Bio-Chip

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Abstract : Pin assignment, scheduling, routing and error detection for arbitrary biochemical protocols in Digital Microfluidic Biochip have been reported in this paper. The research work is concentrating on pin assignment for 2 or 3 droplets routing in the arbitrary biochemical protocol, scheduling and routing in m × n biochip. The volumetric error arises due to droplet split in the biochip. The volumetric error detection is also addressed using biochip AND logic gate which is known as microfluidic AND or mAND gate. The algorithm for pin assignment for m × n biochip required m+n-1 numbers of pins. The basic principle of this algorithm is that no same pin will be allowed to be placed in the same column, same row and diagonal and adjacent cells. The same pin should be placed a distance apart such that interference becomes less. A case study also reported in this paper.

Keywords : digital microfludic biochip, cross-contamination, pin assignment, microfluidic AND gate
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