Fig. 1. Unfolding the loop to prove the non-existence of the decoder for longer path

Fig. 2. Mealy finite state machine

Fig. 3. The parameterized complementary condition

Fig. 4. The circuit that breaks the causal relation

Fig. 5. The loop-like non-complementary condition

Fig. 6. The loop-like non-complementary condition unfolded q times

Fig. 7. Correspondence between $F_{LN}(p, d, l)$ and $F_{LN}(p", d", l")$

Fig. 8. The redundant output letters

TABLE I
INFORMATION OF BENCHMARKS

TABLE II
EXPERIMENTAL RESULTS ON PROPERLY DESIGNED ENCODERS

TABLE III
COMPARING DECODER AREA

TABLE IV
COMPARING CRITICAL-PATH LATENCIES IN NANOSECOND

TABLE V
COMPARING RUNTIME OF IMPROPERLY DESIGNED ENCODERS