Using the two-dimensional coordinates and three-dimensional coordinates test datasets, we evaluate the performance of the HPFIA accelerator configured with single-core, 4-core and 8-core, and HPFIA accelerator executes each dataset 10 million times. Table 1 gives the execution time results. Average time records the statistic average inference period from issuing the first inference command to returning the last inference result. Average time per inference shows the average time for each inference.

Table 1.   The execution time for HPFIA accelerator with varying cores

Datasets	HPFIA with single-core		HPFIA with 4-core		HPFIA with 8-core	
	Average time(s)	Average time per inference(us)	Average time (s)	Average time per inference(us)	Average time (s)	Average time per inference(us)
2D Datasets	96	9.6	22.5	2.25	10.4	1.04
3D Datasets	102	10.2	24.6	2.46	12.1	1.21

We evaluate HPFIA accelerator on FPGA board equipped with Xilinx XC7VX690T using Vivado 2018.3, which work frequency is 125MHz. We host the FPGA board on a server configured with Phytium CPU @2.2GHz for control, and 32GB of DDR4-2133 RAM. The runtime power of FPGA boards are 11W(Watts), 11W, and 13W respectively for single-core, 4-core, and 8-core configurations measured by the power device YOKOHAWA WT310E-C1-H, and those of the entire system are 209W, 209W and 211W as increasing the power consumption of host server.