

Pagerank Algorithm

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Algorithm

$$PR(u) = \sum_{v \in B_u} \frac{PR(v)}{L(v)}$$

The PageRank value for a page u is dependent on the PageRank values for each page v contained in the set B_u (the set containing all pages linking to page u), divided by the number $L(v)$ of links from page v .

System Architecture

- 1) Three arrays used- Node indices of neighbours pointing towards u , Pagerank of all v , Outdegree of all v .
 - 2) Input FIFO sends these three arrays to our module. Node indices array is input for our module for the retrieval of the pageranks and out degree.
 - 3) Our module stores the Pagerank and outdegree array in two BRAMs.
 - 4) Depending on the indices array, page rank and out degree are fetched for respective nodes and module performs computation on these values and the final pagerank is sent to an output BRAM, which has to be again copied to the pagerank BRAM to update the pagerank values for the next iteration.
 - 5) After the iterations are completed, Final pagerank values are sent to the output FIFO.
 - 6) Resources used: RTL block of our project, BRAM for pagerank, BRAM for outdegree, BRAM for output pageranks, Input FIFO and output FIFO, DMA and ZYNQ processing system.
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UTILISATION SUMMARY

LUTs	Registers	IOB
1789	1994	103

TIMING SUMMARY

TNS Total Endpoi nts	Worst Slack			Clock Period	Clock Frequency
	Setup(WNS)	Hold(WHS)	PW(WPWS)		
194	3.245	0.078	9.500	20.000	50 MHz

POWER SUMMARY

Circuit	Total On Chip Power	Dynamic	Device Static
Ripple Carry Adder	0.118	0.014	0.105