

## Path Delay Prediction with Convolutional Neural Networks

Due to process variations, the delay of a path is not a deterministic value but a normal distribution. Usually the  $n \times \sigma$  points, e.g.,  $3\sigma$ , of the path delay need to be calculated and verified with respect to the timing constraints. These delay points are determined by the path structure, the circuit components on the path and their relative locations. The former defines the types and the sizes of the components, while the latter affects the correlation between their delays. In other words, how a path looks like on the chip after physical design determines the path delay and thus the  $n \times \sigma$  points. This graphical appearance of the path can be processed by a convolutional neural network (CNN), which is widely used in computer vision to detect special patterns in images, to produce accurate  $n \times \sigma$  points of the path delay.

In this master thesis, a CNN is used to predict the delays of paths after physical design. This method has a great potential in accelerating the delay evaluation significantly, and thus the time-to-market time of IC design.

If you are interested in this topic for master thesis, please contact:

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