

Deopout designs of deep learning

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Dropout is used in deep learning. It is a method of learning by invalidating nodes with randomly for each layer in the multi-layer neural network. And it deletes a random sample of activations (nodes) to zero during the training process. A random sample of nodes cause more irregular frequency of dropout edges. We proposed a combinatorial design of dropout nodes from each partite which balances frequency of edges.

Let V_1, \dots, V_n be mutually distinct point sets, and $\mathcal{C} = \{(C_1; C_2; \dots; C_n) \mid C_i \subset V_i, C_i \neq \emptyset, 1 \leq i \leq n\}$. Each C_i is called a subblock. Put each block set $\mathcal{B}_i = \{(C_i; C_{i+1}; \dots; C_{i+t-1})\}$ consisting of successive t subblocks for $1 \leq i \leq n - (t - 1)$. If, for any d_i points from V_i , $1 \leq i \leq t$, the points are contained exactly λ_i blocks of \mathcal{B}_i , then $((V_1, \dots, V_n), \mathcal{C})$ is called a dropout design of type (d_1, d_2, \dots, d_t) .

In this talk, I will introduce the design and show the construction for dropout design of circulant type by using finite geometry.

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