A simple method to overcome oversmoothing

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Abstract: In this lecture, we empirically investigate the distinct long-term behaviors of prenorm and postnorm attention-based graph neural networks. We observe that prenorm models, while do not occur oversmoothing, are prone to the curse of depth. In contrast, postnorm models exhibit the opposite behavior. To mitigate oversmoothing, we propose a simple and efficient approach that incorporates Laplacian energy multiplication prior to the diffusion step. Both theoretical analysis and empirical results demonstrate that our method effectively alleviates oversmoothing.