

Colorful Cutout: Enhancing Image Data Augmentation with Curriculum Learning

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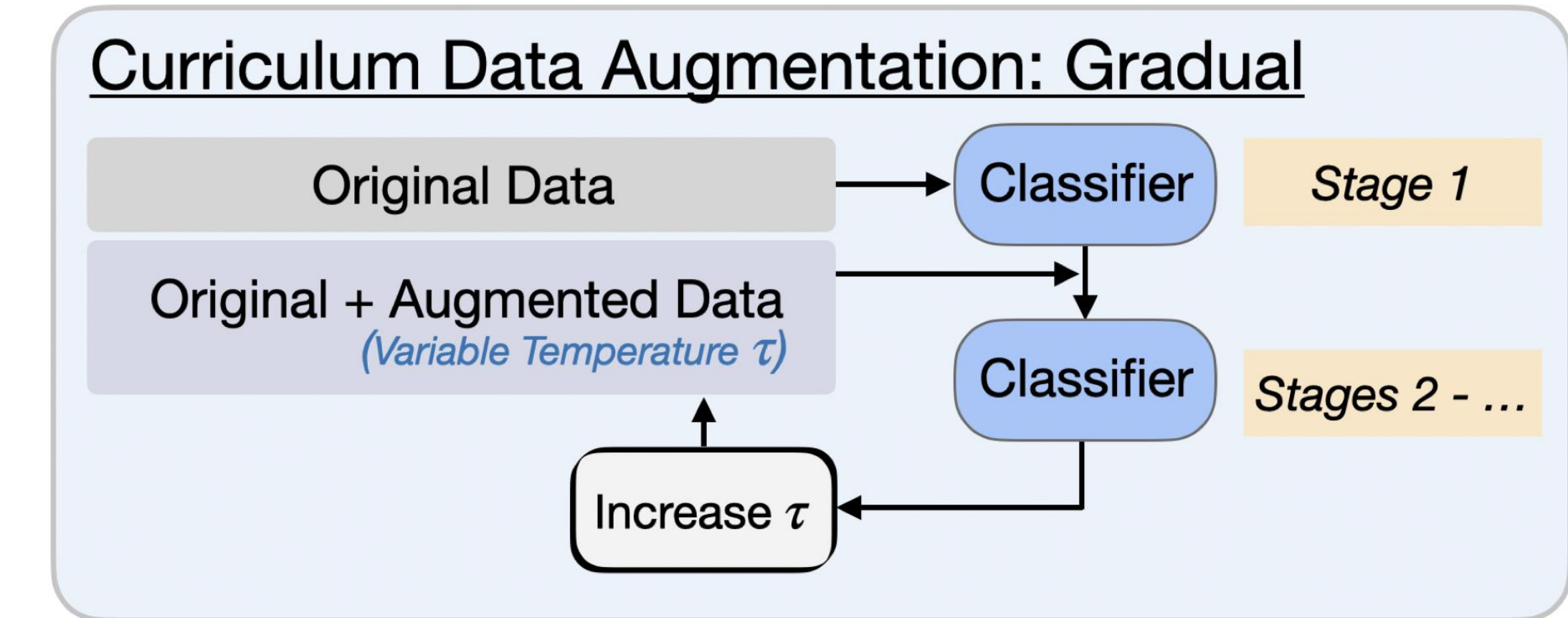
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Preliminary & Motivation

- Data augmentation is effective strategy for mitigating overfitting and enhancing the performance of the model
- Recently, the concept of **curriculum data augmentation** is proposed in NLP field¹²³
- In this work, we investigate to incorporate curriculum data augmentation for image data

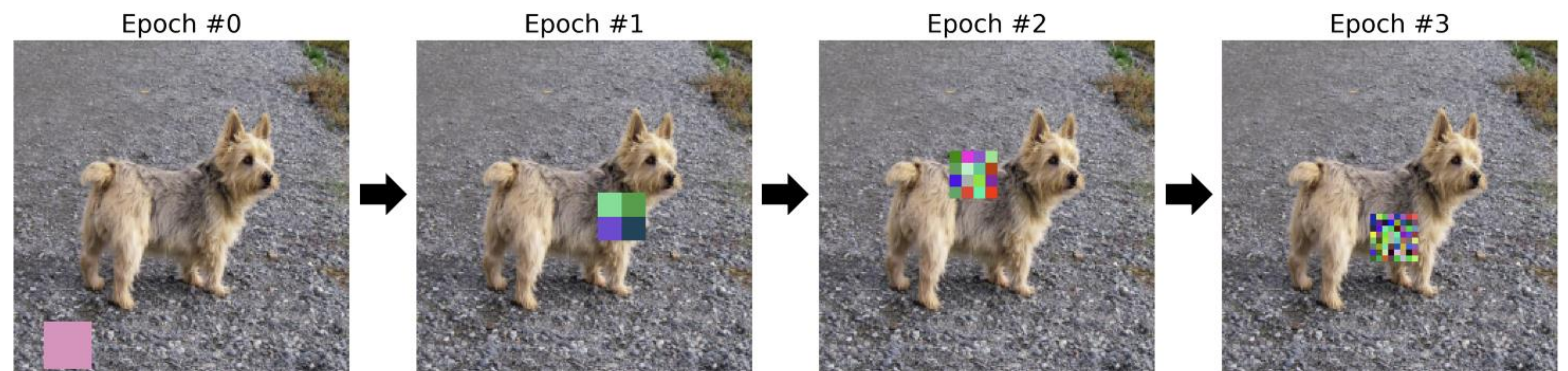
1. Wei et al., *Few-Shot Text Classification with Triplet Networks, Data Augmentation, and Curriculum Learning*, NAACL 2021.
2. Ye et al., *Efficient Contrastive Learning via Novel Data Augmentation and Curriculum Learning*, EMNLP 2021.
3. Lu and Lam, *PCC: Paraphrasing with Bottom-k Sampling and Cyclic Learning for Curriculum Data Augmentation*, EACL 2023.



Method

- We apply cutout⁴ augmentation to given image and fill the box with random color
- Additionally, we divide the box and fill it with different colors as the training progresses

4. DeVries and Taylor, *Improved Regularization of Convolutional Neural Networks with Cutout*, arXiv Preprint 2017.



Experiment & Conclusion

- We trained three models on three datasets with different data augmentation methods
- We found our method is effective compared to the baseline methods
- Moreover, our ablation study reveals the importance of curriculum learning

Dataset	ResNet50			EfficientNet-B0			ViT-B/16		
	C10	C100	TI	C10	C100	TI	C10	C100	TI
Baseline	94.82	80.56	73.09	96.48	82.38	78.25	95.58	83.94	81.54
Cutout	95.49	80.97	73.52	96.56	82.53	78.41	96.08	84.21	81.49
Mixup	95.56	81.15	73.24	96.63	82.50	78.26	96.45	84.25	81.48
CutMix	95.67	81.45	73.63	96.67	82.96	78.53	96.27	84.32	81.82
Ours	95.16	81.15	73.61	96.72	82.92	78.32	96.35	84.20	82.15
w/o Curr.									
Ours	95.70	81.57	73.81	96.81	83.37	78.65	96.55	84.36	82.36