

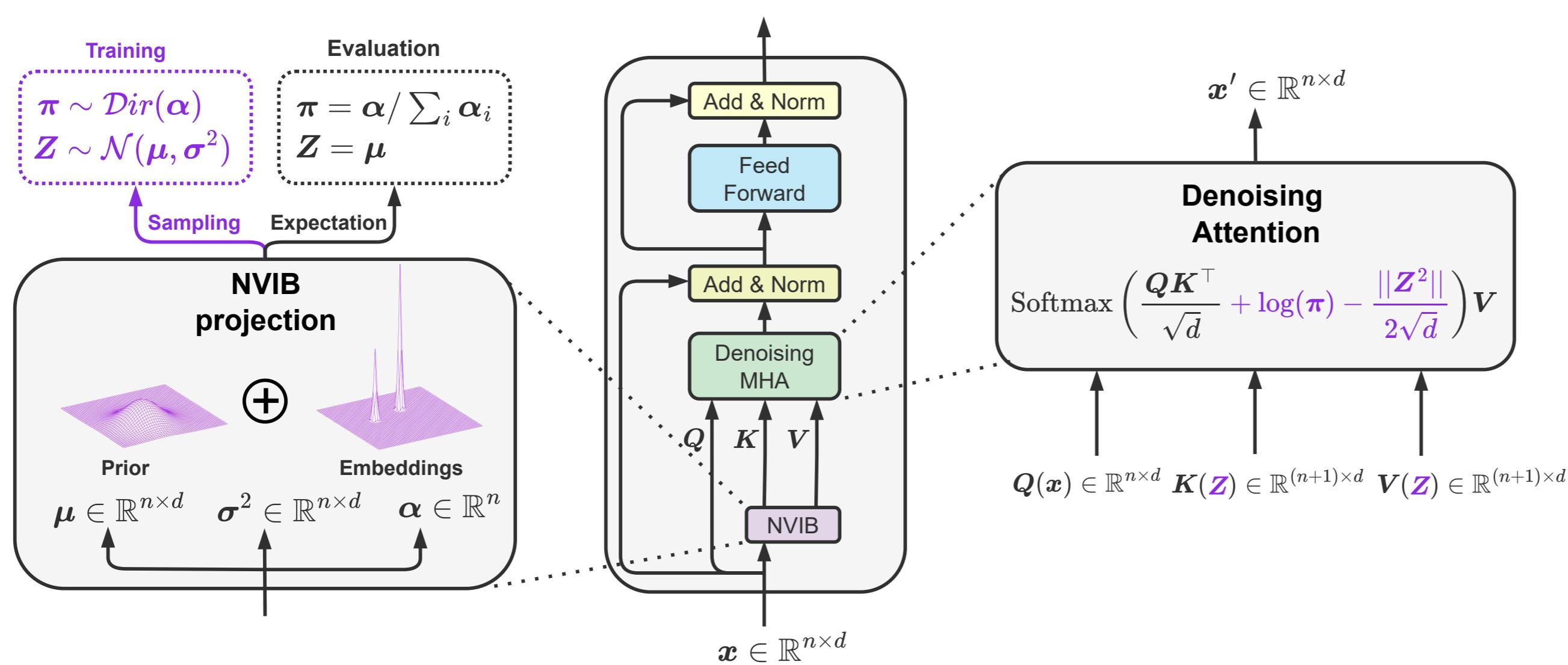
Improve Generalisation?

Fine-tune with NVIB!

Fine-tuning Pretrained Models with NVIB for Improved Generalisation

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What is Nonparametric Variational Information Bottleneck (NVIB) ?



NVIB is an information-theoretic regulariser for attention

Applicable to pretrained models:
Text, Graphs, Speech & Vision

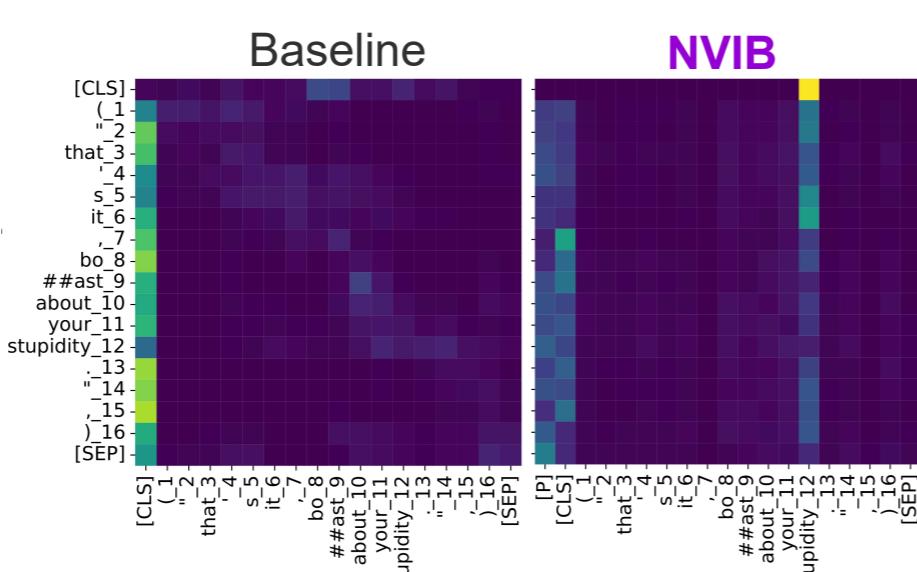
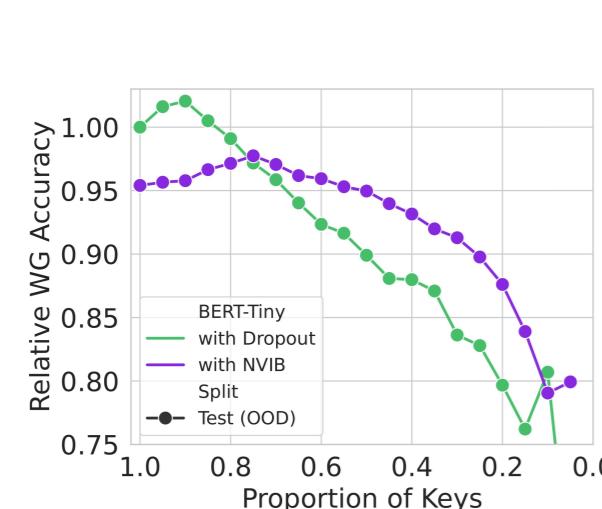


Improves out-of-distribution generalisation

Now Fine-Tunable!



Sparse & interpretable attention



Generalise to unseen graphs

	MRR↑	H@1↑	H@5↑	H@10↑
BLPBERT-Tiny	0.164	0.100	0.175	0.288
with Dropout	0.162	0.097	0.172	0.288
with NVIB	0.167	0.103	0.180	0.294

Task: Graph link prediction
Model: BERT-Tiny
Data: FB15k-237



Generalise to noise & language

	PCC↑
W2V2-base	0.80 (0.01)
with Dropout	0.83 (0.03)
with NVIB	0.83 (0.02)

	F1↑
W2V2-large	0.90 (0.02)
with Dropout	0.90 (0.01)
with NVIB	0.91 (0.02)

Task: Speech quality prediction
Model: W2V2-base
Data: Tencent (OOD)

Task: Speech Language identification
Model: W2V2-large
Data: FLEURS (OOD)



Data efficiency & robustness



Task: Image robustness to attacks

Model: DeiT-Tiny

Data: PrivacyAlert

