

# A Hybrid Conditional Variational Autoencoder Model for Personalised Top- $n$ Recommendation

Supplementary Material

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## ABSTRACT

This is the supplementary material for [1], and contains the parameter settings for the various models deployed.

## APPENDIX

In [1], we report evaluation results obtained after repeating each experiment 5 times. The hyperparameters used for training each model, across all repetitions, are detailed in Table 1, Table 2, & Table 3 for the MovieLens 100K, MovieLens 1M and Ta-Feng datasets, respectively.

## ACKNOWLEDGMENTS

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## REFERENCES

- [1] Yaxiong Wu, Craig Macdonald, and Iadh Ounis. 2020. A Hybrid Conditional Variational Autoencoder Model for Personalised Top- $n$  Recommendation. In *Proceedings of ICTIR 2020*. <https://doi.org/10.1145/3409256.3409835>

Table 1: Hyperparameters - ML-100K.

Model	Latent dimensions	Size of embeddings $E_{pref}$	Size of embeddings $E_{dem}$	Learning rate	Batch size
WMF	10	-	-	0.001	-
BPR-MF	10	-	-	0.01	-
VAECF	10	-	-	0.001	1
H-VAE (C*)	10	10 (items)	-	0.001	1
CVAE <sub>ced</sub> (A)	10	-	10	0.001	1
CVAE <sub>clf</sub> (A)	10	-	10	0.001	1
HCVAE <sub>ced</sub> (C)	10	10	-	0.001	1
HCVAE <sub>ced</sub> (A + C)	10	7	3	0.001	1
HCVAE <sub>clf</sub> (C)	10	10	-	0.001	1
HCVAE <sub>clf</sub> (A + C)	10	7	3	0.001	1

Table 2: Hyperparameters - ML-1M.

Model	Latent dimensions	Size of embeddings $E_{pref}$	Size of embeddings $E_{dem}$	Learning rate	Batch size
WMF	10	-	-	0.001	-
BPR-MF	10	-	-	0.01	-
VAECF	10	-	-	0.001	8
H-VAE (C*)	10	10 (items)	-	0.001	8
CVAE <sub>ced</sub> (A)	10	-	10	0.001	8
CVAE <sub>clf</sub> (A)	10	-	10	0.001	8
HCVAE <sub>ced</sub> (C)	10	10	-	0.001	8
HCVAE <sub>ced</sub> (A + C)	10	7	3	0.001	8
HCVAE <sub>clf</sub> (C)	10	10	-	0.001	8
HCVAE <sub>clf</sub> (A + C)	10	7	3	0.001	8

**Table 3: Hyperparameters - Ta-Feng.**

Model	Latent dimensions	Size of embeddings $E_{pref}$	Size of embeddings $E_{dem}$	Learning rate	Batch size
WMF	10	-	-	0.001	-
BPR-MF	50	-	-	0.001	-
VAECF	10	-	-	0.001	32
H-VAE (C*)	10	10 (items)	-	0.001	32
CVAE <sub>ced</sub> (A)	10	-	10	0.001	32
CVAE <sub>clf</sub> (A)	10	-	10	0.001	32
HCVAE <sub>ced</sub> (C)	10	10	-	0.001	32
HCVAE <sub>ced</sub> (A + C)	10	7	3	0.001	32
HCVAE <sub>clf</sub> (C)	10	10	-	0.001	32
HCVAE <sub>clf</sub> (A + C)	10	7	3	0.001	32