Variational Autoencoders on Astronomical Catalogs

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**Abstract**

*Write a short abstract combining intro and conclusion*

Keywords: ml process, autoencoder, neural networks, tensorflow, pytorch

# 

# Introduction

Write the intro similar to the draft. Add background/motivation of why we are choosing neural networks. (This is covered in the first paragraph of the draft.) (Use this reference <https://astrostatistics.psu.edu/2012Significance.pdf> ) Add citations

## Neural Networks

Explain what is neural network. Use: <https://www.javatpoint.com/artificial-neural-network> and <https://www.javatpoint.com/keras-artificial-neural-networks>

Insert one figure explaining neural network architecture and add citations.

Next, explain what is deep learning. Use: <https://www.javatpoint.com/deep-learning> and try and add this type of figure: (AI-ML-DL)

<https://www.google.com/search?q=what+is+deep+learning&tbm=isch&ved=2ahUKEwjelazMitL7AhXCn3IEHRWoBuoQ2-cCegQIABAA&oq=what+is+deep+learning&gs_lcp=CgNpbWcQAzIFCAAQgAQyBQgAEIAEMgUIABCABDIFCAAQgAQyBQgAEIAEMgUIABCABDIFCAAQgAQyBQgAEIAEMgUIABCABDoHCAAQgAQQGDoECAAQHjoGCAAQCBAeUNcRWKAWYLwZaABwAHgAgAFMiAHLApIBATWYAQCgAQGqAQtnd3Mtd2l6LWltZ8ABAQ&sclient=img&ei=YkuFY97cK8K_ytMPldCa0A4&bih=789&biw=1512&client=firefox-b-1-d#imgrc=AKWx97owgZ-L_M>

1. TensorFlow vs Pytorch

Explain what are deep learning frameworks: Use- <https://developer.nvidia.com/deep-learning-frameworks>

Briefly explain TensorFlow: <https://www.javatpoint.com/tensorflow-introduction>

Briefly explain PyTorch: <https://www.javatpoint.com/pytorch-introduction>

Briefly explain variational autoencoder: <https://ermongroup.github.io/cs228-notes/extras/vae/>

(I will write code translating TensorFlow to PyTorch via running a variational autoencoder)

1. The ML Process

Don’t write anything here for now (Explain Dataset – Doing EDA – Defining VaDE – Running – Output)

1. Conclusion.

Not yet (Summary of neural networks – pytorch & tensorflow – results of VaDE)

References

1. Feigelson, E.D., & Babu, G.J. (2012). Big data in astronomy. Significance, 9.