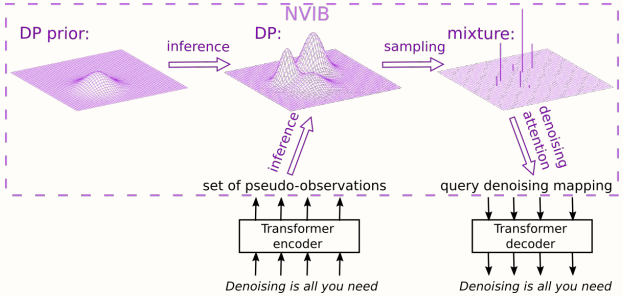
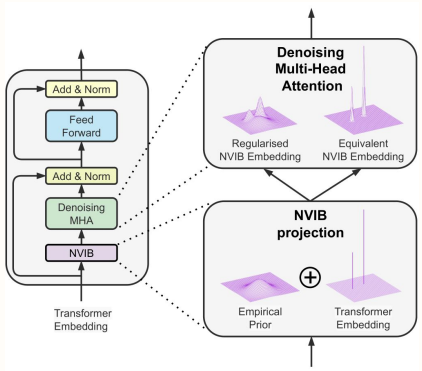




Association for Computational Linguistics

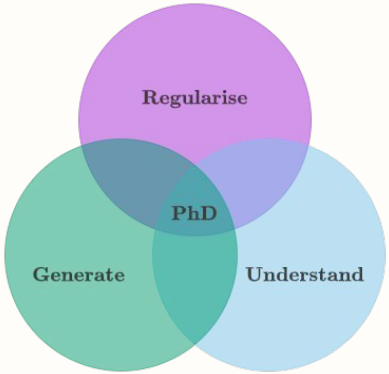
COLM

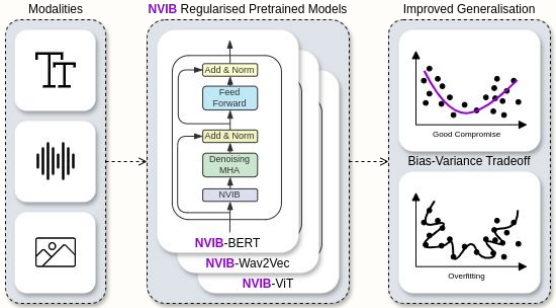
EMNLP 2023

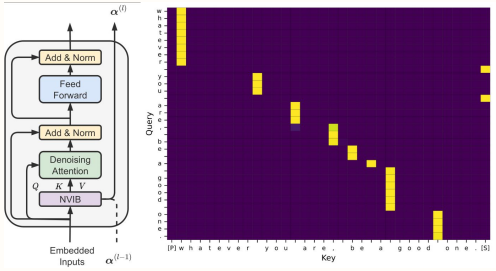
ICLR

A brief history of NVIB

2020 - 2024 and beyond!







Meeting Jamie

Late 2020 (Covid)

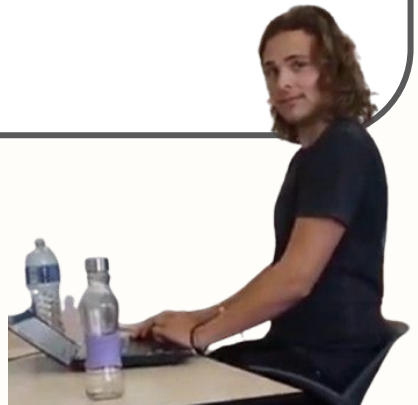
Meeting Jamie

Meeting Jamie

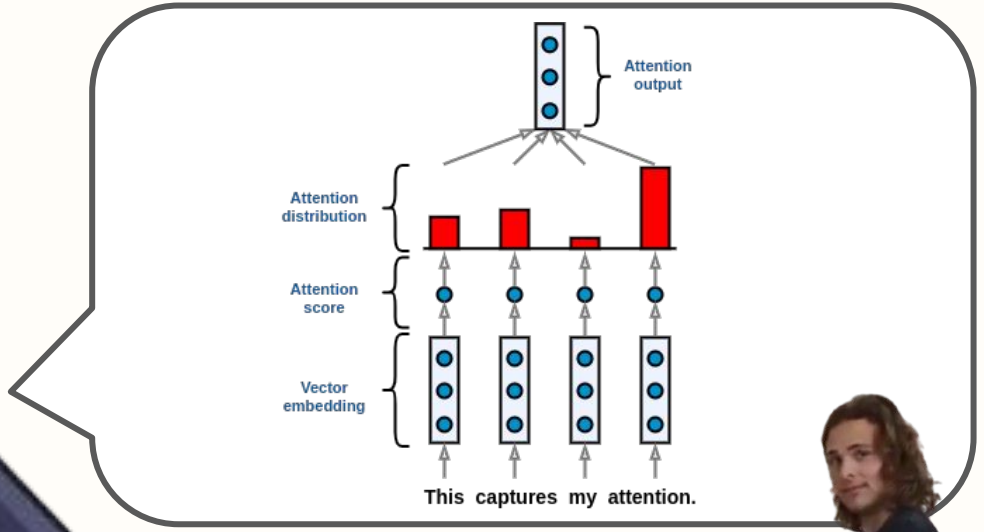
Where is he? …

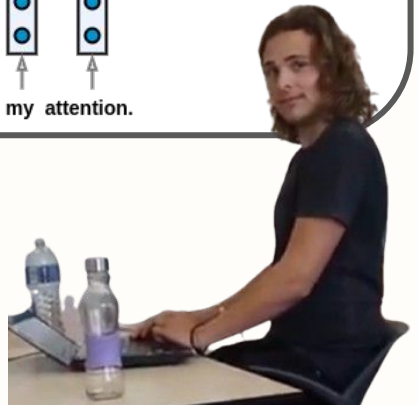
Meeting Jamie

...

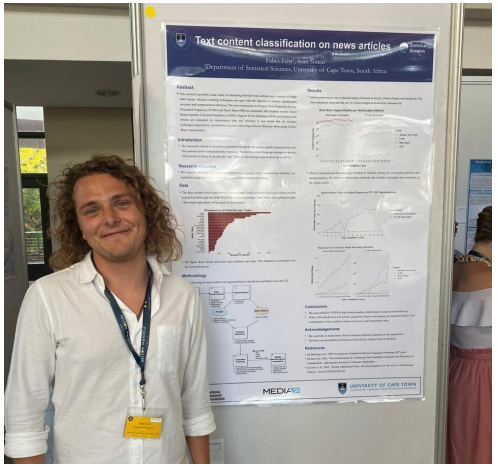


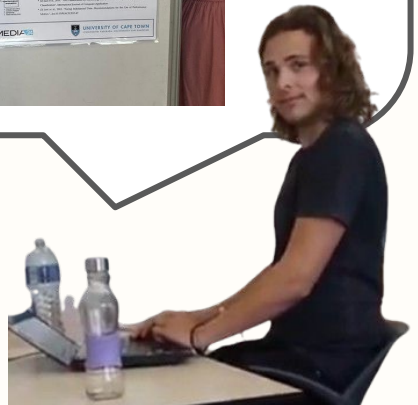
Meeting Jamie



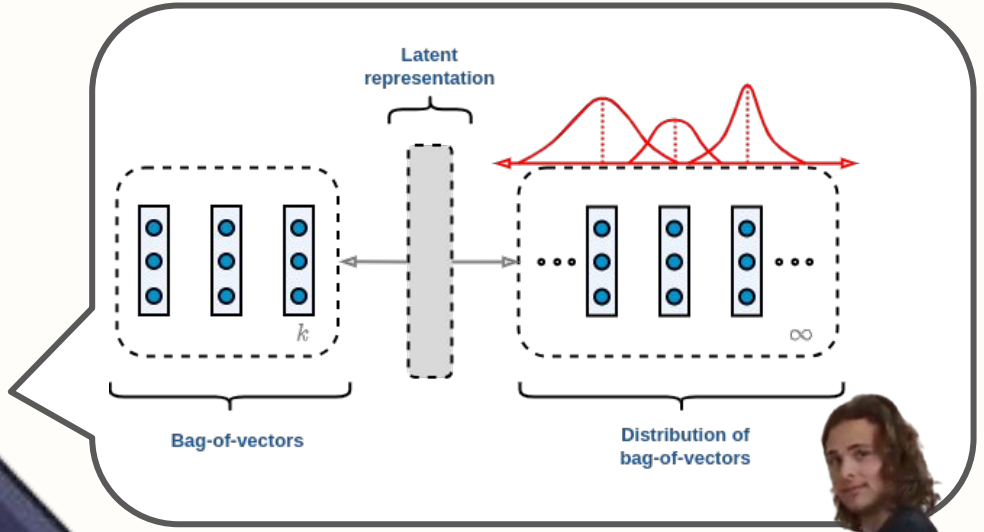


Meeting Jamie

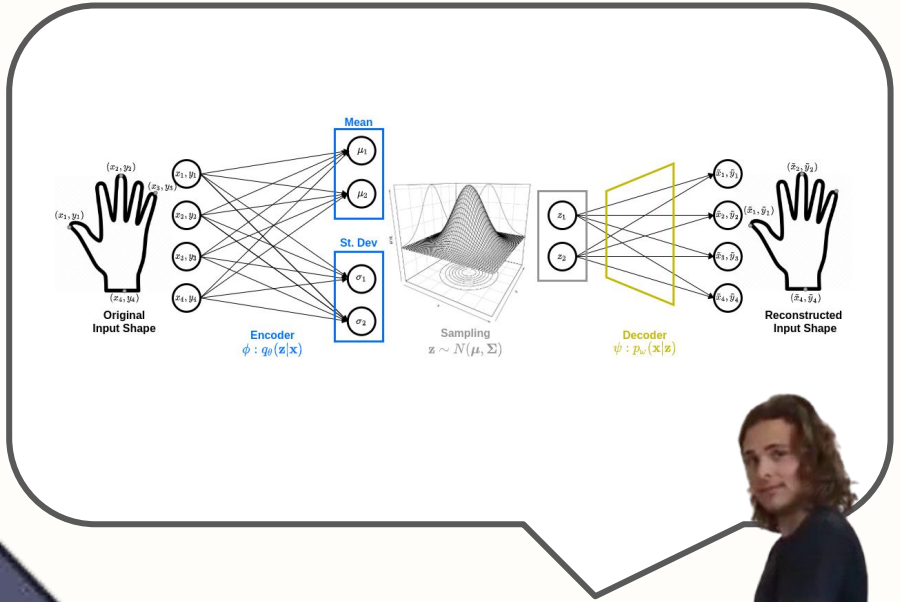


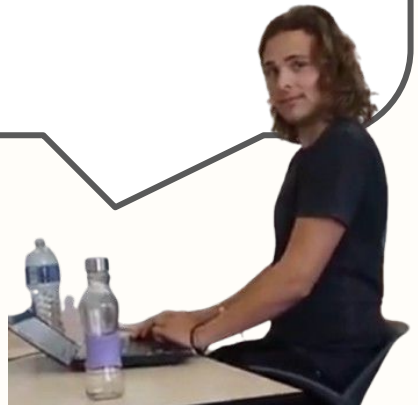


Meeting Jamie

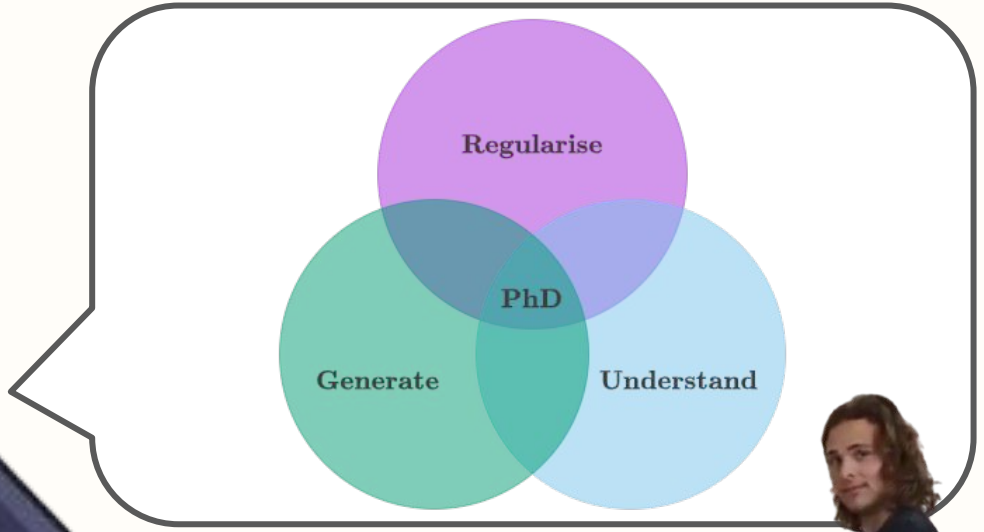


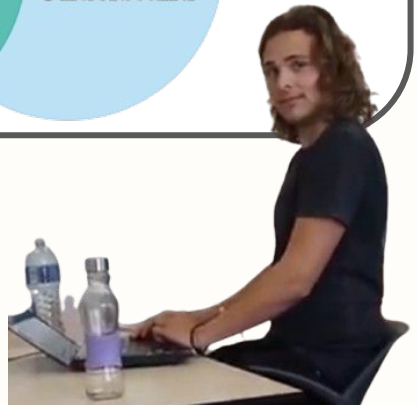
Meeting Jamie





Meeting Jamie

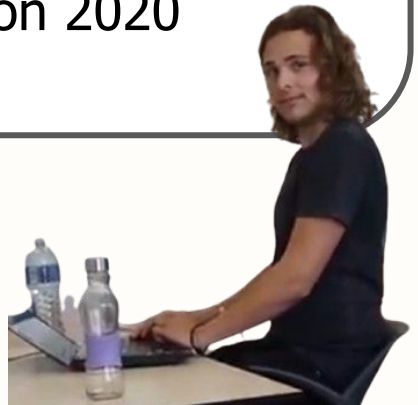




Meeting Jamie

I can’t guarantee it will be easy, but it will be so cool!

- Henderson 2020



Meeting Jamie

NVIB - Not Very Informed Boy

First year 2021

NVIB - Not Very Informed Boy

- Jamie was patient

NVIB - Not Very Informed Boy

- Jamie was patient
- Supportive of collaboration

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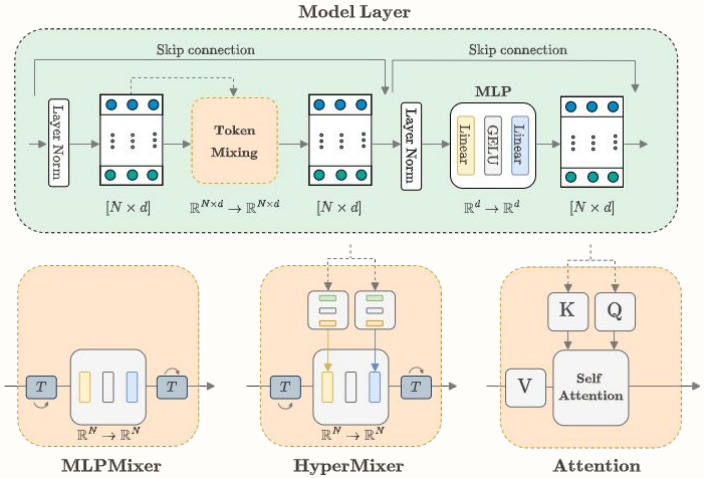


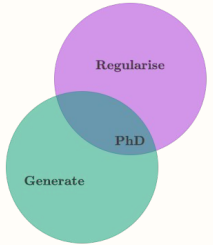
Association for Computational Linguistics

Hypermixer - (Mai et al. 2022)

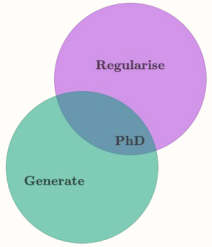
NVIB - Nervously Verifying Initial Beliefs

Second year 2022

NVIB - Nervously Verifying Initial Beliefs

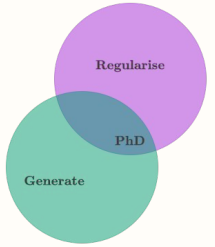


NVIB - Nervously Verifying Initial Beliefs

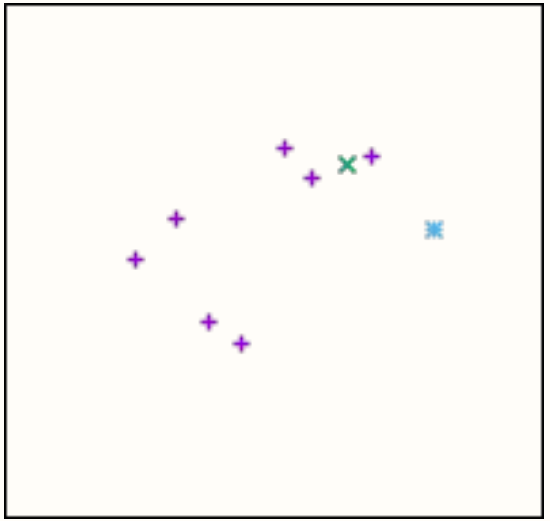


$$\text{Attn}(Q\,K\,V) = \text{Softmax}\left(\frac{QK^T}{\sqrt{d}}\right)V$$

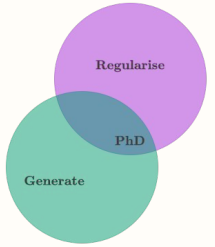
NVIB - Nervously Verifying Initial Beliefs



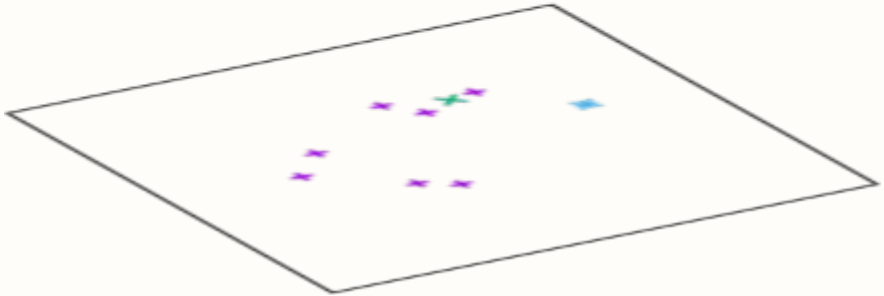
$$\text{Attn}(U\,Z) = \text{Softmax}\left(\frac{U Z^T}{\sqrt{d}}\right) Z$$



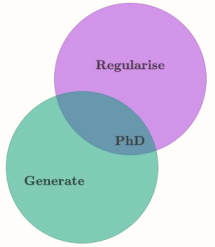
NVIB - Nervously Verifying Initial Beliefs



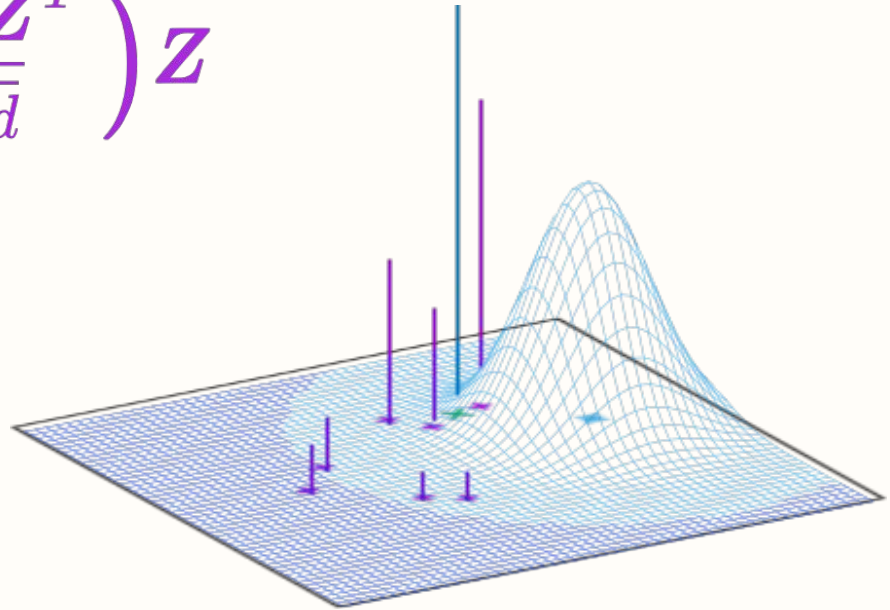
$$\text{Attn}(U\,Z) = \text{Softmax}\left(\frac{UZ^T}{\sqrt{d}}\right)Z$$



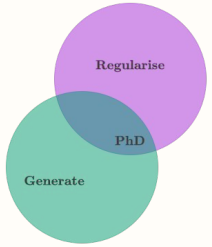
NVIB - Nervously Verifying Initial Beliefs



$$\text{Attn}(U\,Z) = \text{Softmax}\left(\frac{U Z^T}{\sqrt{d}}\right) Z$$

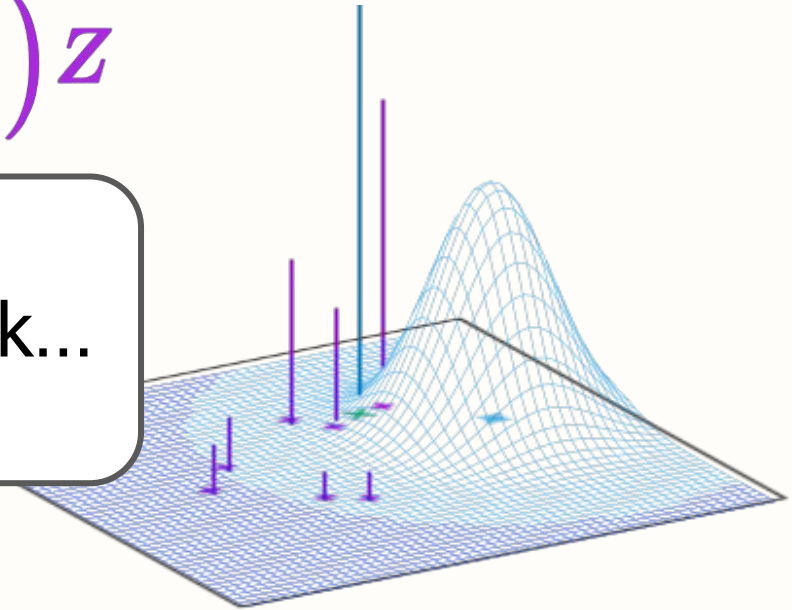


NVIB - No Vacation, Its Brutal

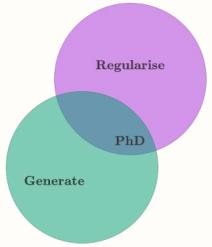


$$\text{Attn}(U, Z) = \text{Softmax}\left(\frac{UZ^T}{\sqrt{d}}\right)Z$$

Getting it to work...



NVIB - Not Valid, It's Broken!



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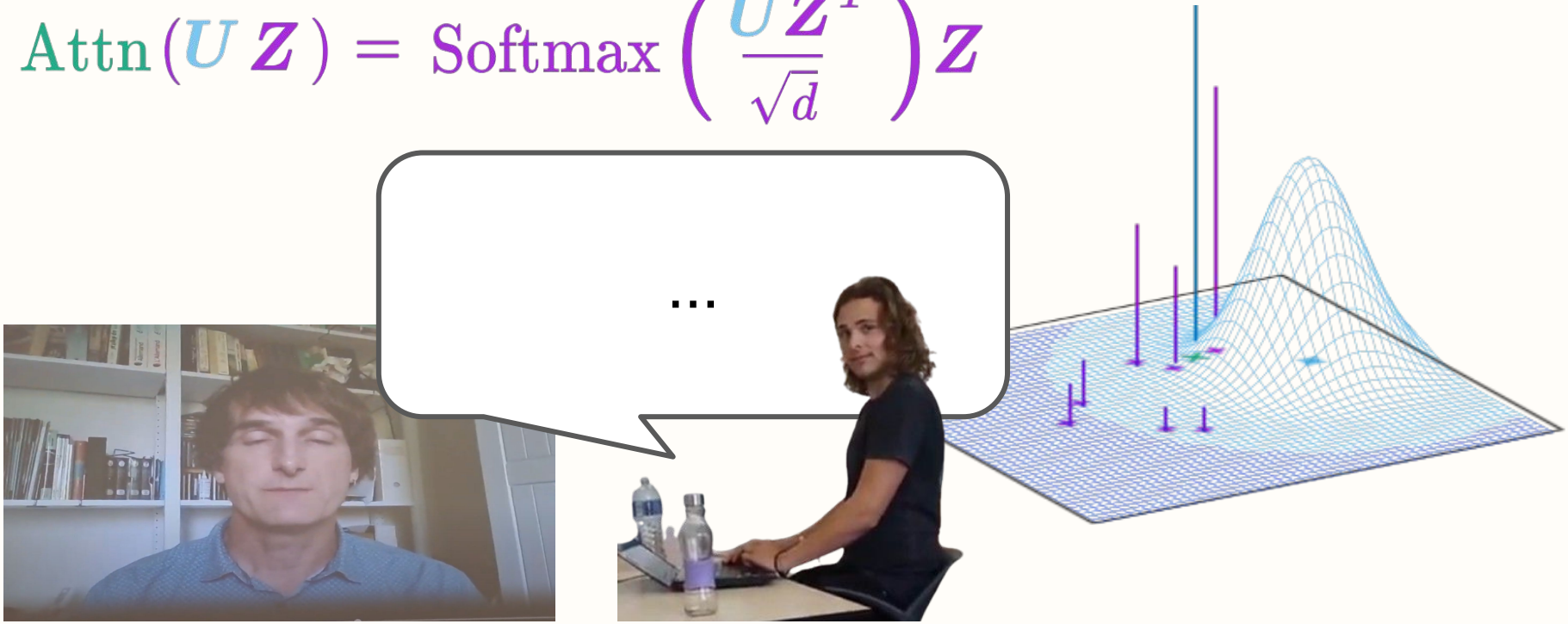
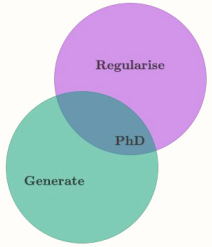
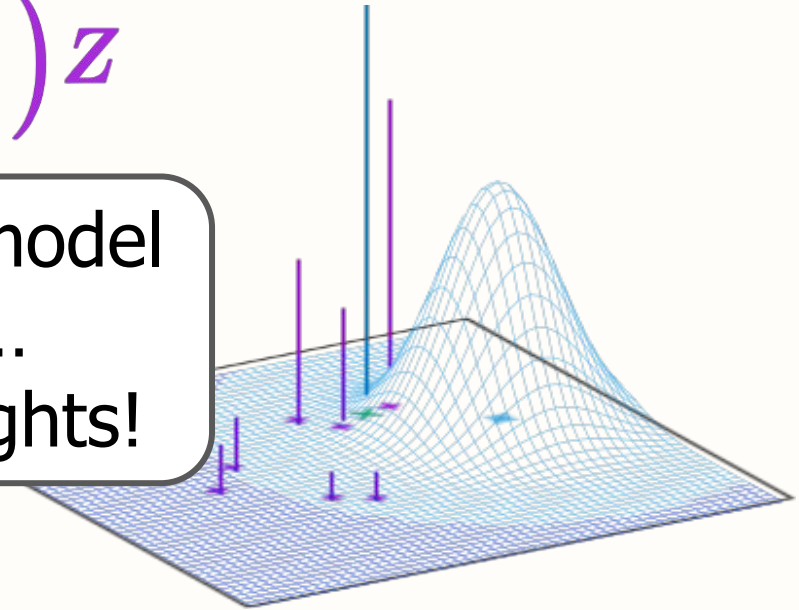


NVIB - Next Visionary Invention Begins!

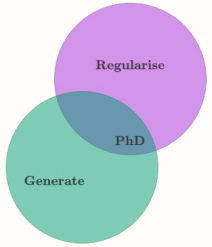


$$\text{Attn}(\boldsymbol{U}\,\boldsymbol{Z}) = \text{Softmax}\left(\frac{\boldsymbol{U}\boldsymbol{Z}^T}{\sqrt{d}}\right)\boldsymbol{Z}$$

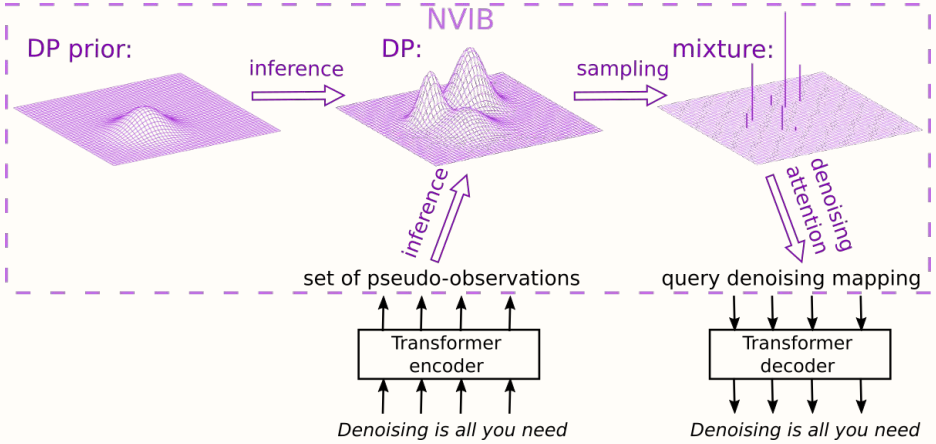
This is the true model of language… Therefore, thoughts!

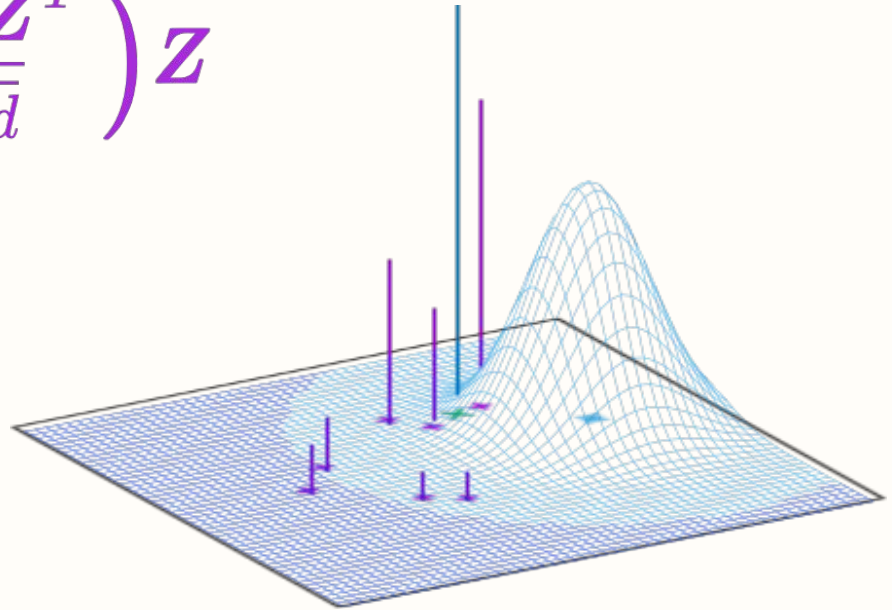


NVIB - Next Visionary Invention Begins!



$$\text{Attn}(U\,Z) = \text{Softmax}\left(\frac{U Z^T}{\sqrt{d}}\right) Z$$





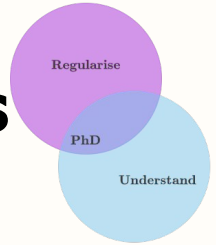
A VAE for Transformers (Henderson & Fehr, 2022)

ICLR

NVIB - New Vision, Innovative Breakthroughs

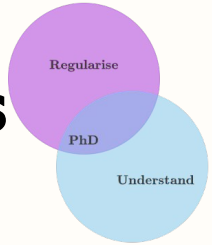
Third year 2023

NVIB - New Vision, Innovative Breakthroughs

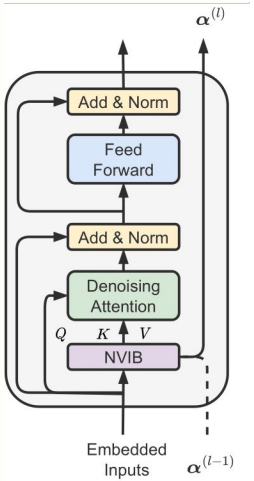


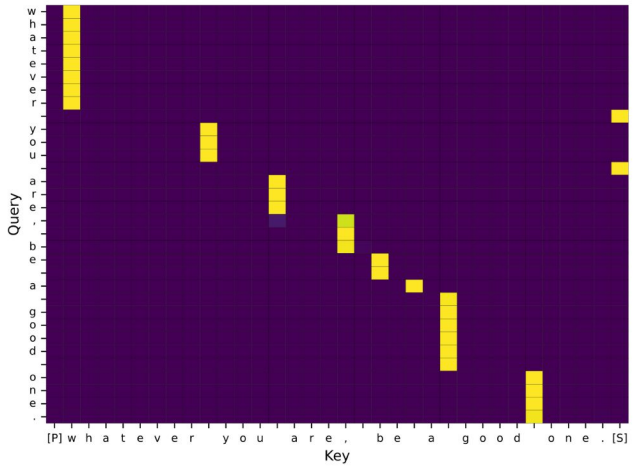
- Stacked self attention with NVIB

NVIB - New Vision, Innovative Breakthroughs

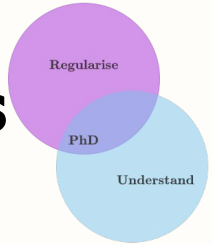


- Stacked self attention with NVIB
- Abstraction!

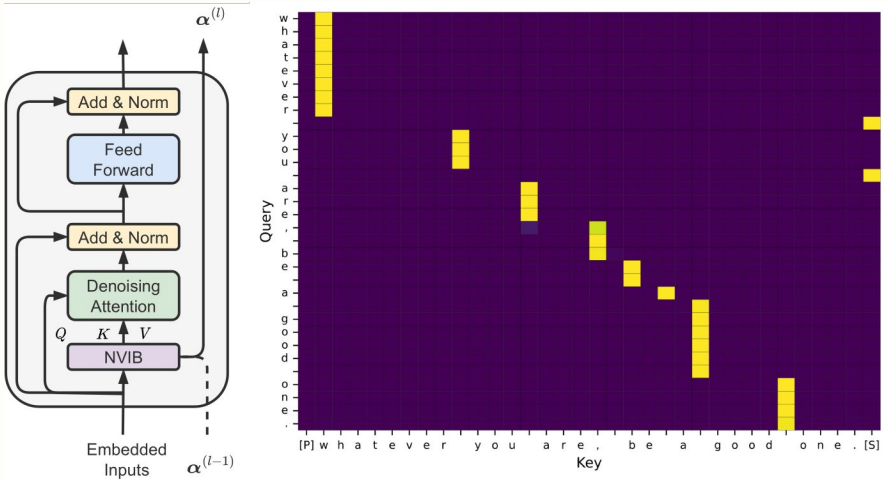




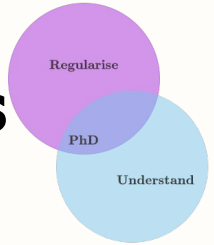
NVIB - New Vision, Innovative Breakthroughs



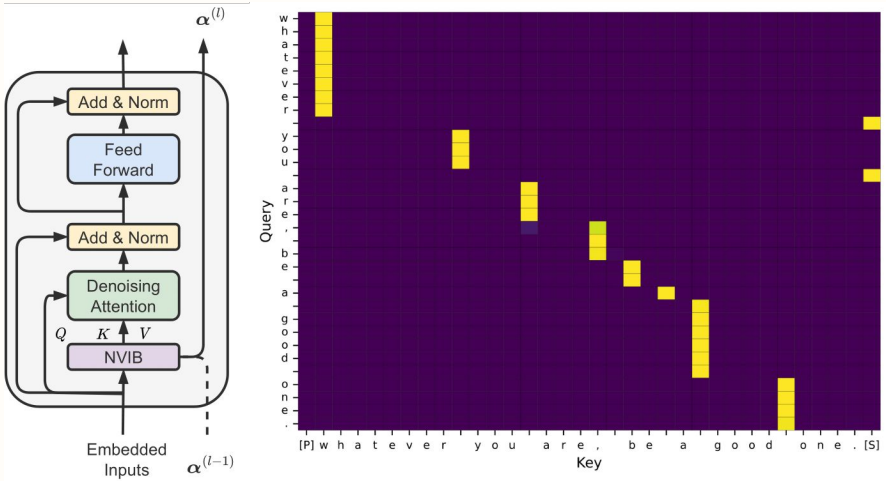
- Stacked self attention with NVIB
- Abstraction!



NVIB - New Vision, Innovative Breakthroughs



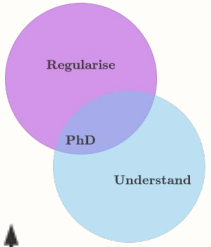
- Stacked self attention with NVIB
- Abstraction!



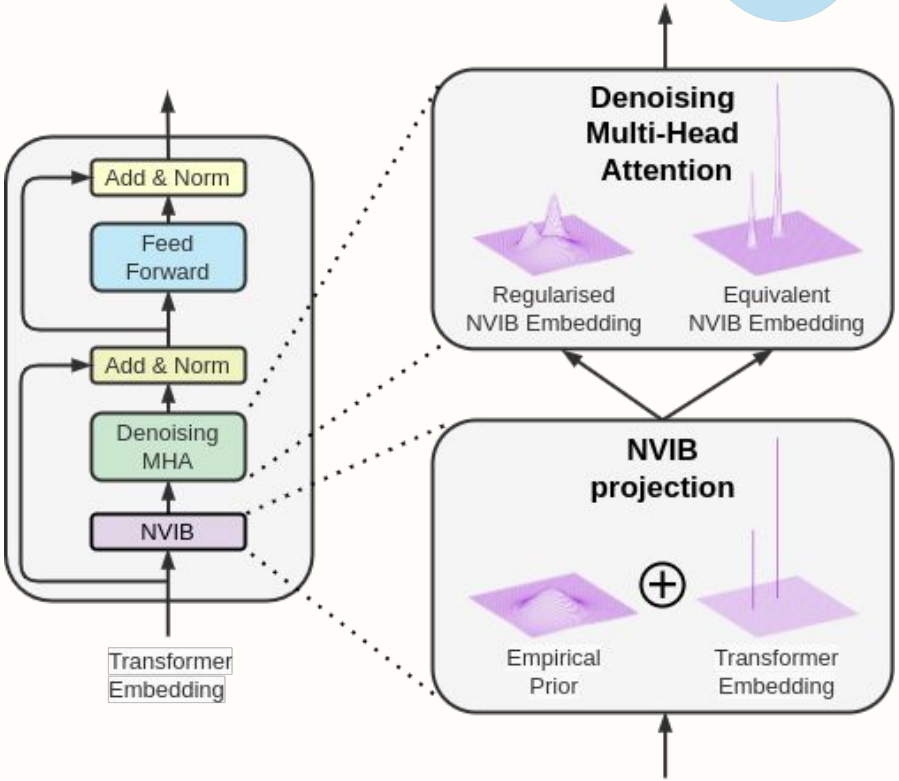
Learning to abstract (Behjati & Fehr, 2023)

EMNLP 2023

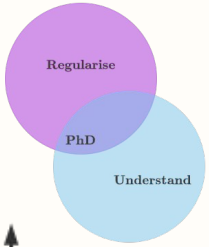
NVIB - Novel, Very Interesting, But...



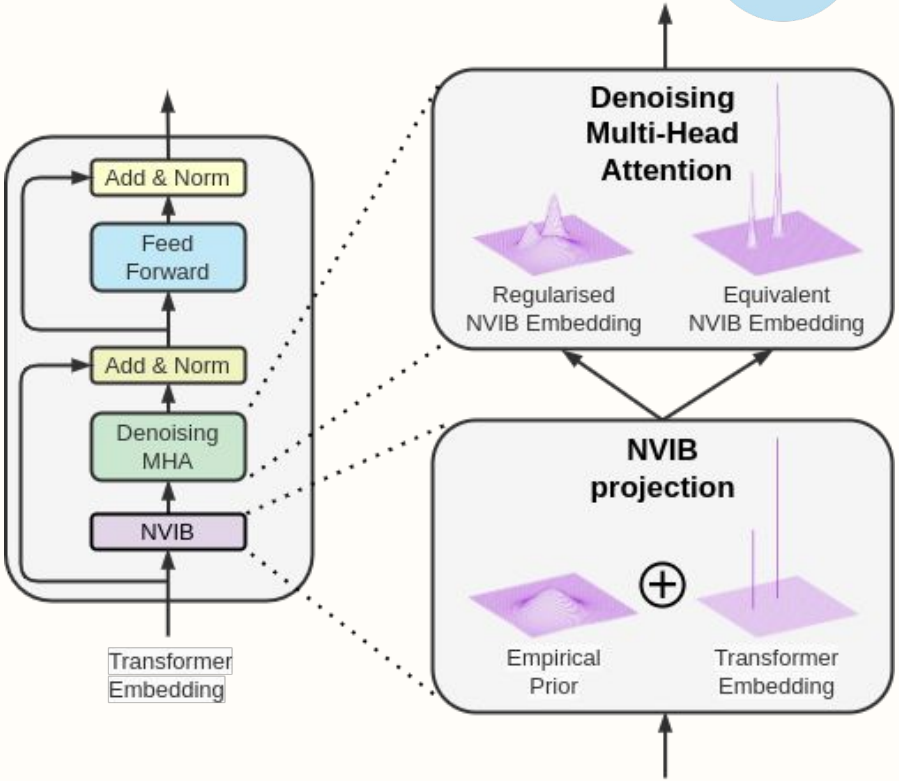
- Reinterpret pretrained models



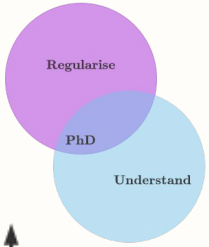
NVIB - Novel, Very Interesting, But...



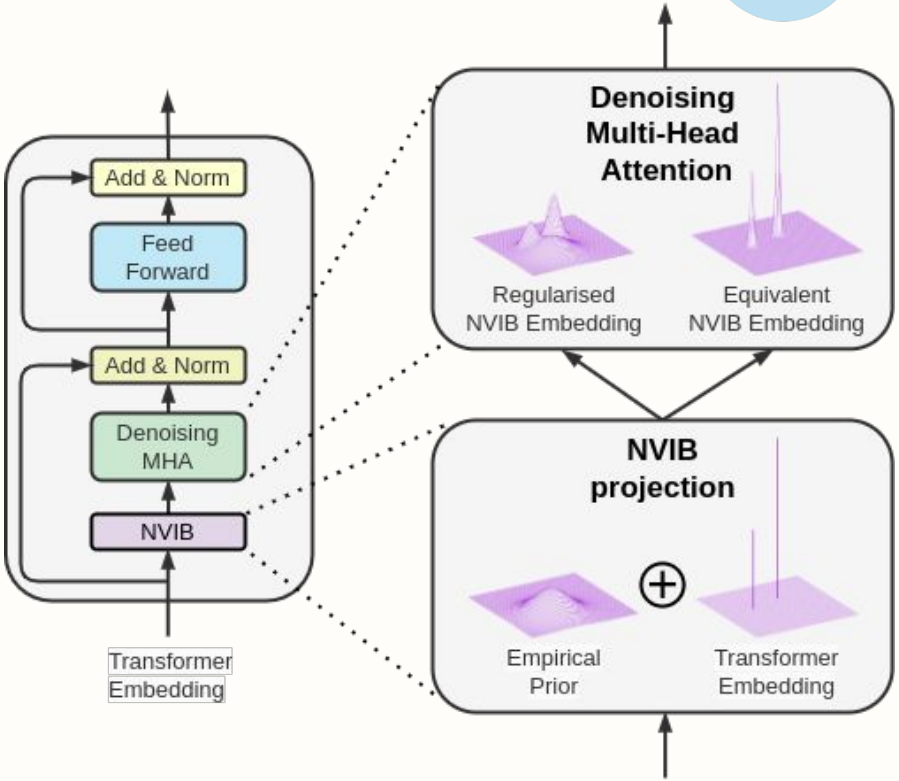
- Reinterpret pretrained models
- Post-training regularisation



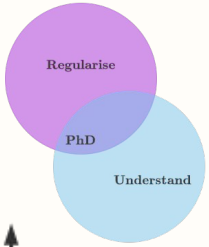
NVIB - Novel, Very Interesting, But...



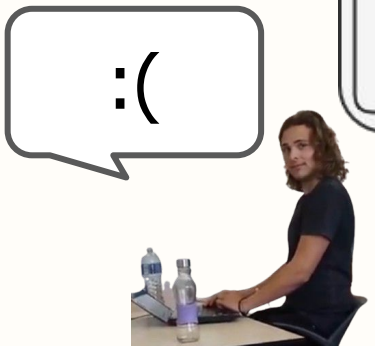
- Reinterpret pretrained models
- Post-training regularisation
- Submitted to ICML

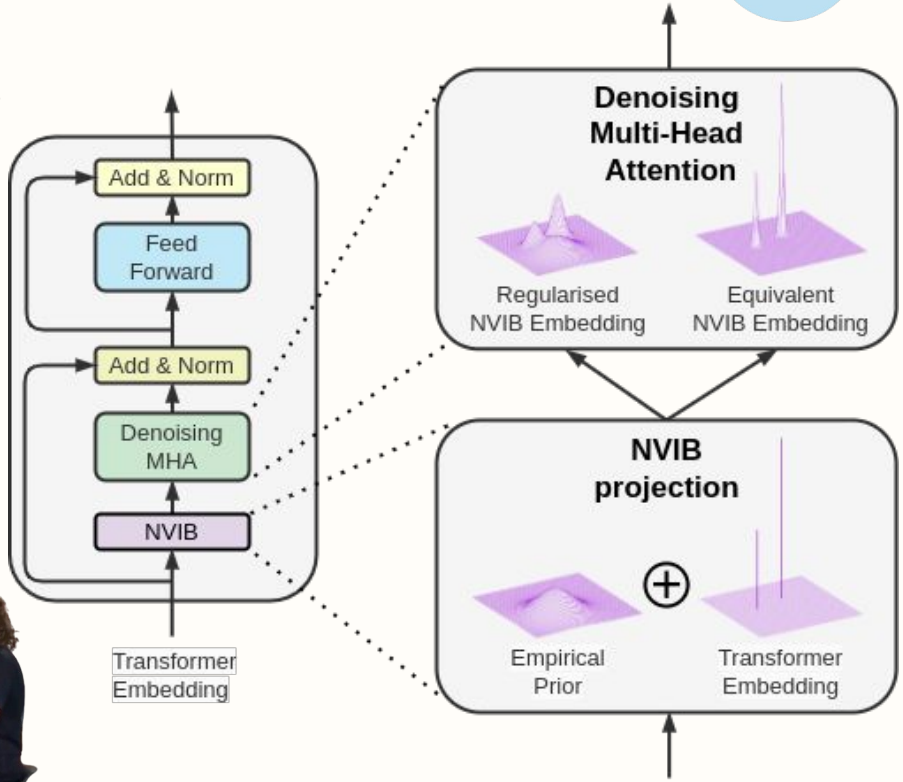


NVIB - Not Very Impressive Boasts



- Reinterpret pretrained models
- Post-training regularisation
- Submitted to ICML
- Rejected!

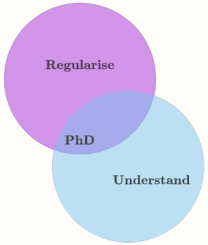




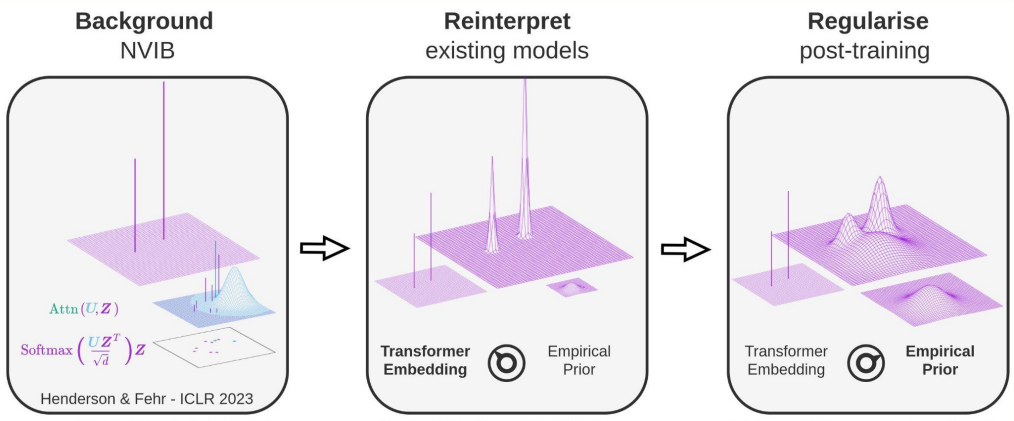
NVIB - Now Various Iterations. Building!

Fourth year 2024

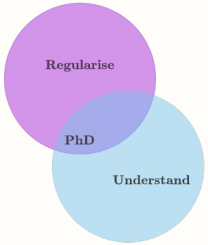
NVIB - Now Various Iterations. Building!



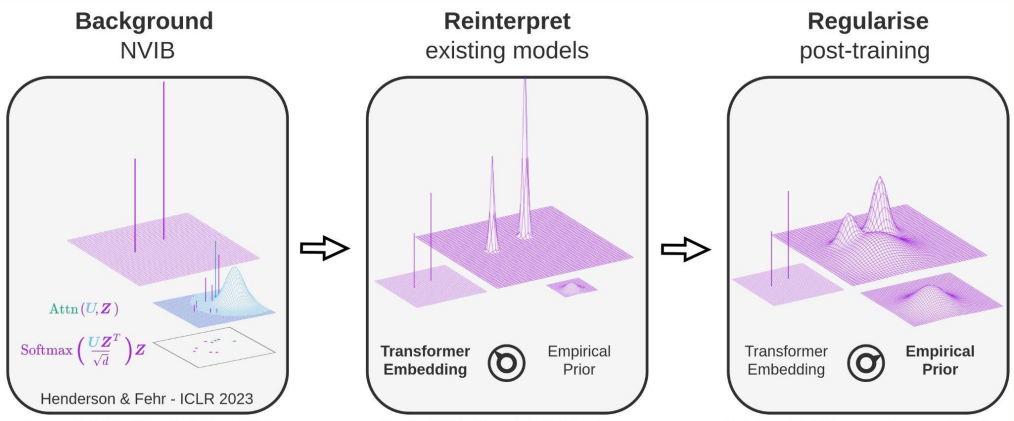
- Re-submitted and accepted at COLM!

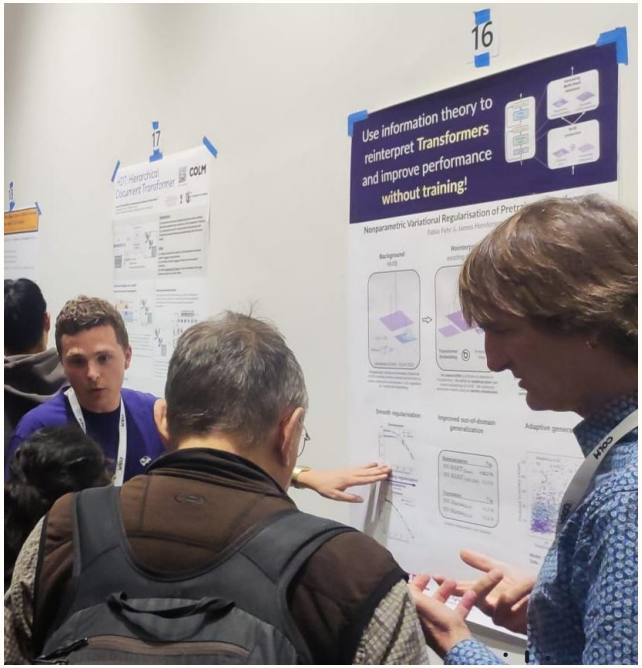


NVIB - Now Various Iterations. Building!



- Re-submitted and accepted at COLM!





Nonparametric Variational Regularisation (Fehr & Henderson, 2024)

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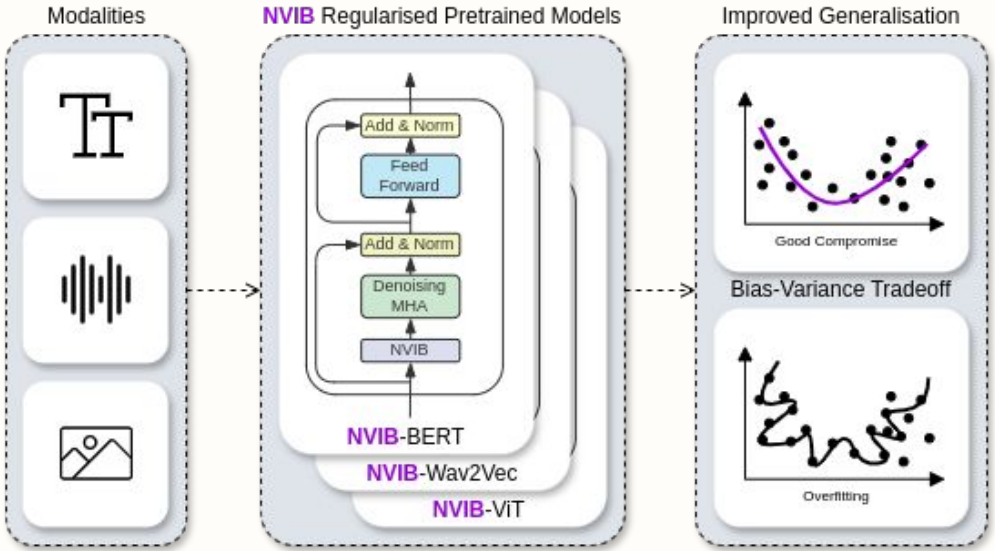
NVIB - Now Various Iterations. Building!

Regularise

PhD

- Fine-tuning and multiple modalities!



NVIB - Now Various Iterations. Building!

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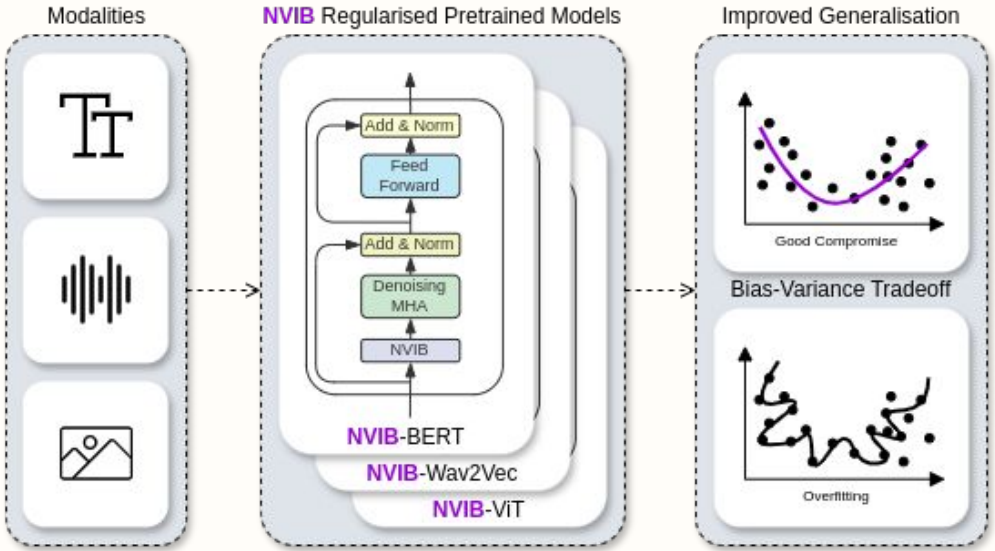

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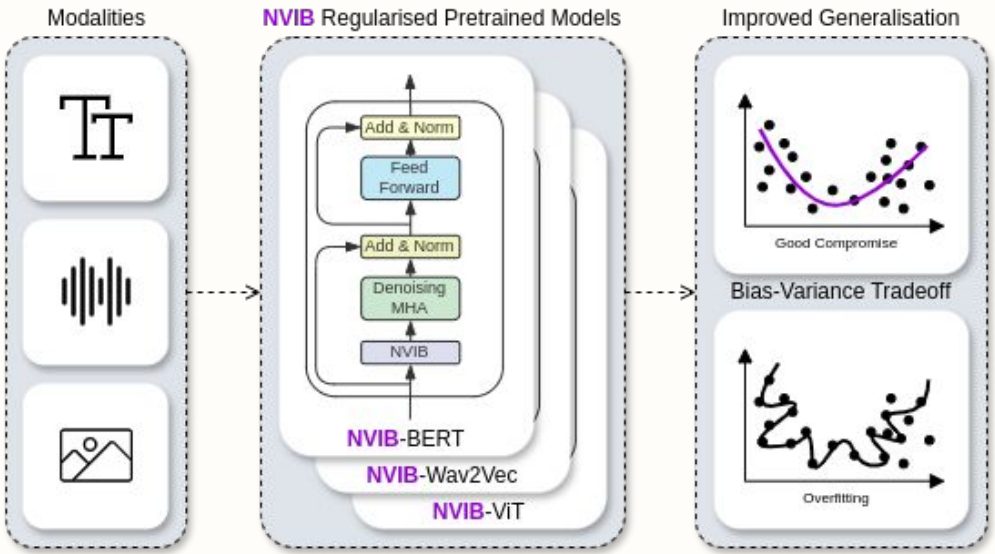
NVIB - Now Various Iterations. Building!

- Fine-tuning and multiple modalities!



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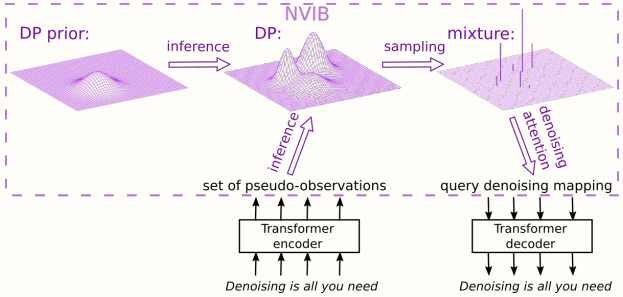

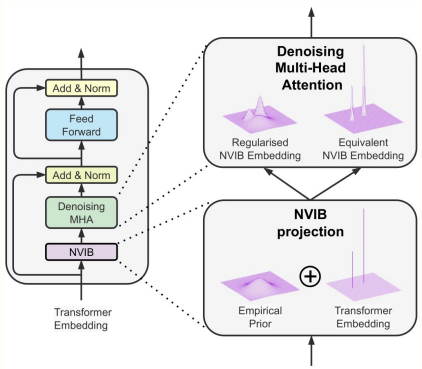

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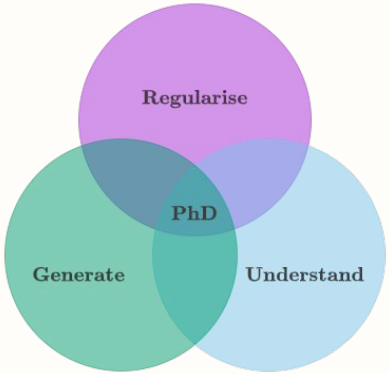
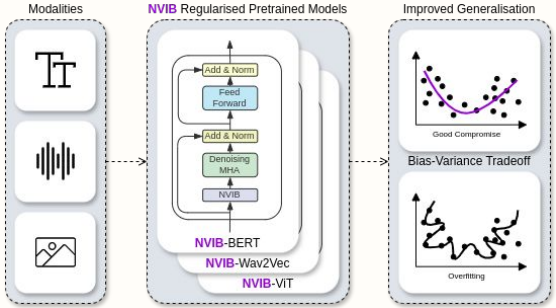
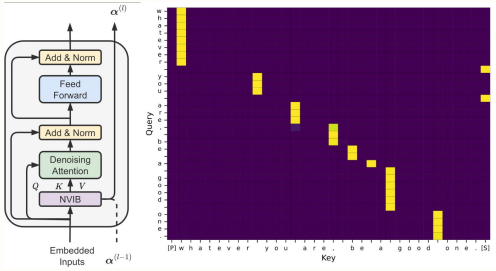
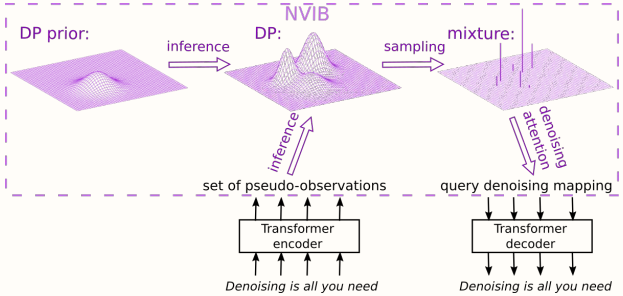
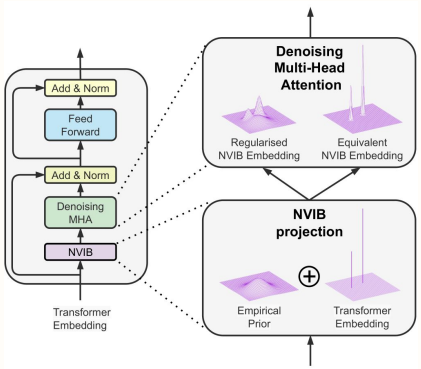
Nonparametric Variational Information Bottleneck!











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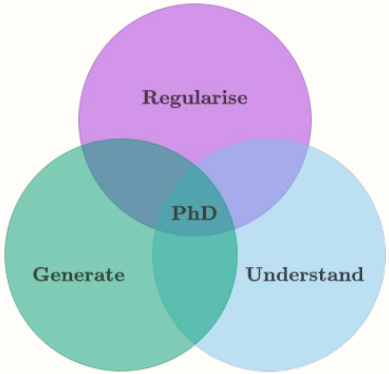
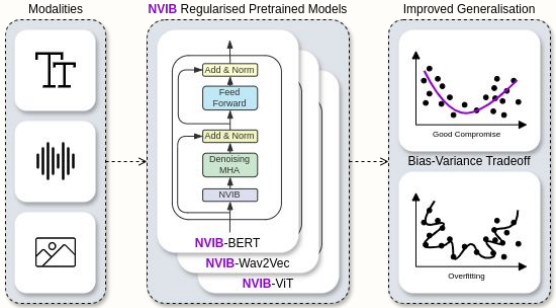
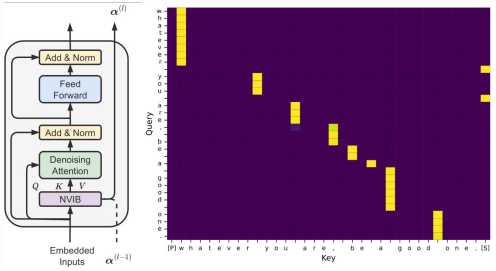
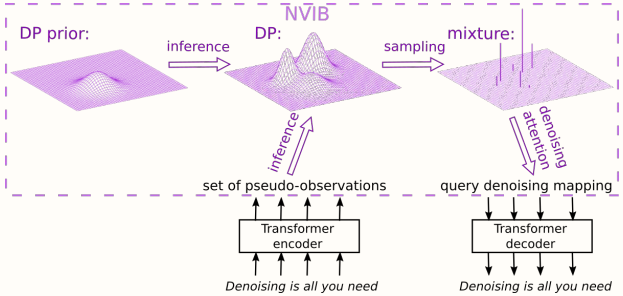
Happy birthday Jamie!

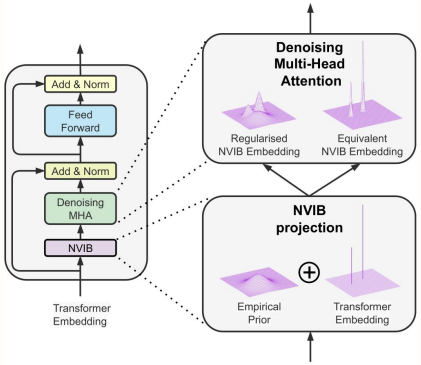
Thank you!











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Happy birthday Jamie!

Thank you!

It was not easy, but it has been cool!

- Fehr 2024