

Generative Modeling for Neuroimaging

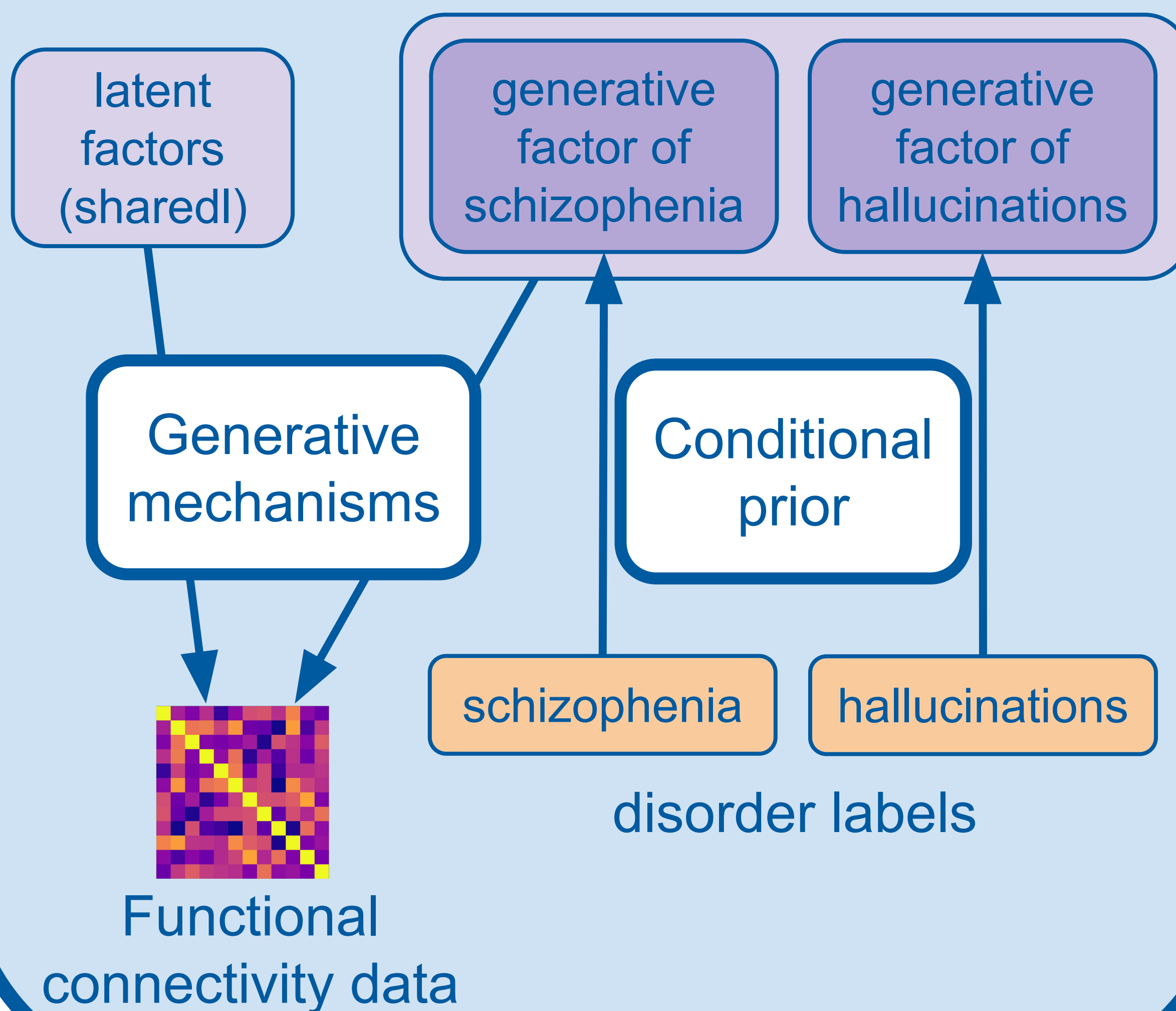
Learning neurological mechanisms of mental disorders with VAEs

Background

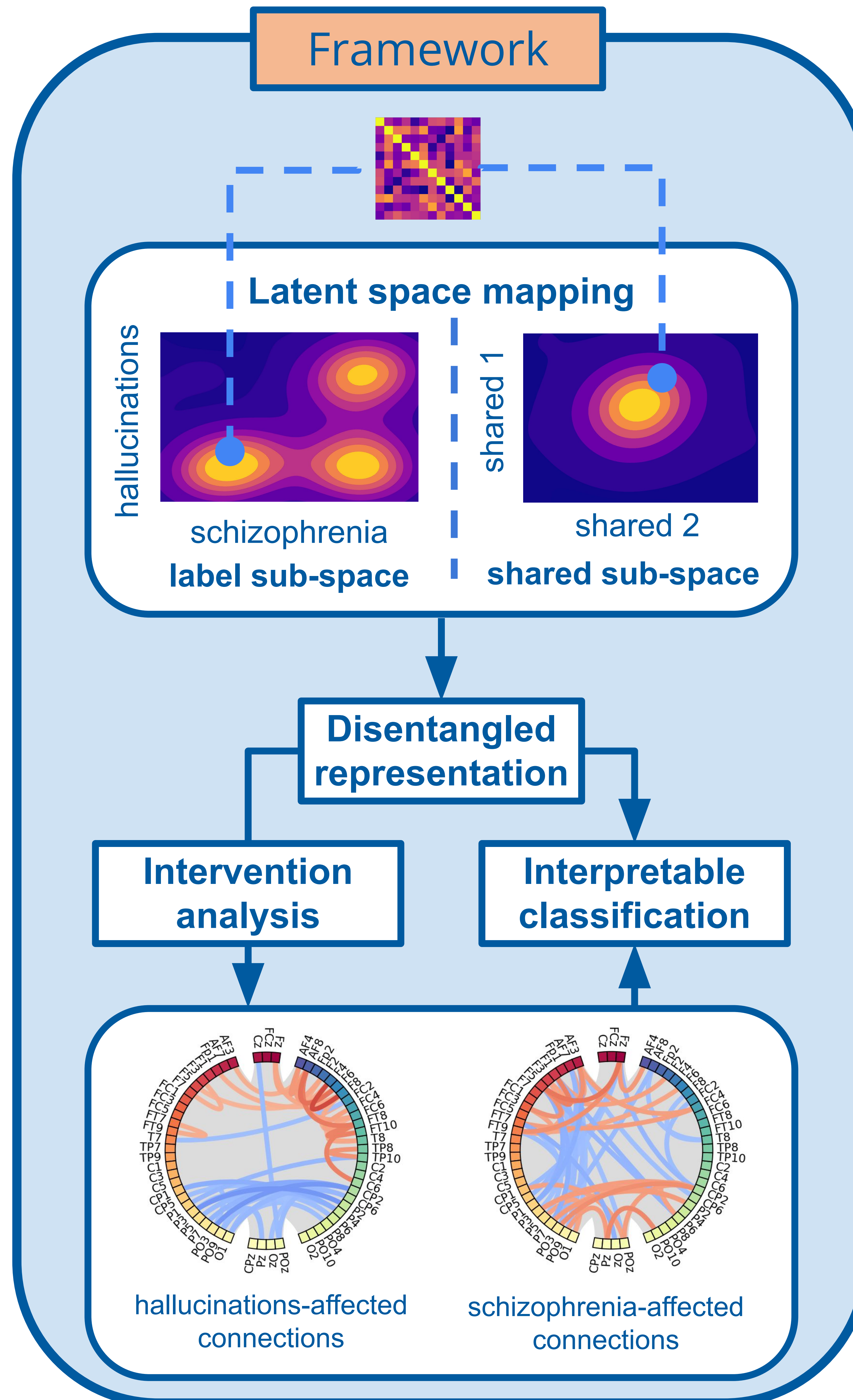
- Neuroimaging requires a ML classifier to be **interpretable** and **robust**;
- Auditory verbal **hallucinations** are common symptom of **schizophrenia**;
- **Neurological mechanisms** of such hallucinations are unknown.

Methods

- Characteristic capturing variational auto-encoders (**CCVAEs**) [1]
- **Influence** of a disorder is captured *only* by the corresponding latent → disentanglement

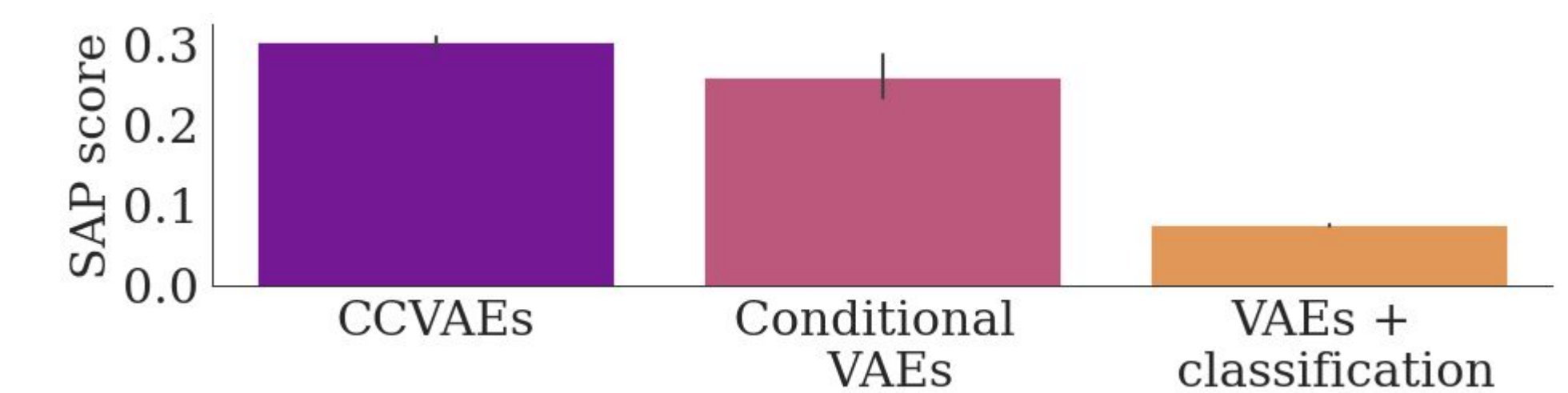


Framework



Comparison

Disentanglement metric



Confusion matrices



Conclusion

- Interpretation via decoding latents;
- Learned disorder-related mechanisms are **consistent** with domain knowledge;
- **Interpretable** classification of neuroimaging data via disentanglement.

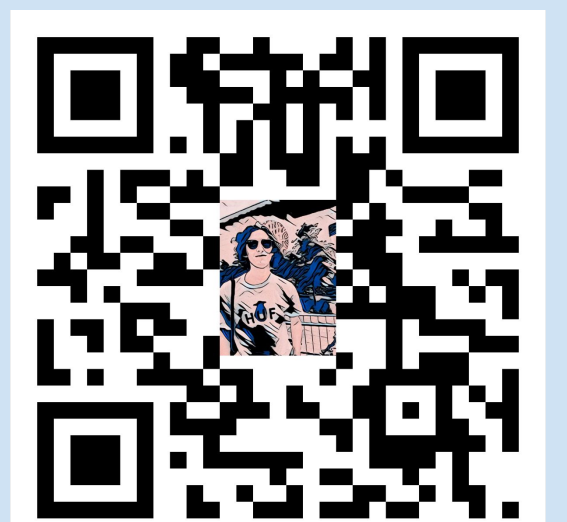
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