Artificial Intelligence in Healthcare

Identifying neuroimaging phenotypes with AI

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Outline

Plan for the day

1. Do we need new imaging phenotypes?
2. How can we identify new phenotypes with neural networks?
3. Use case: Explainable AI for dementia
4. Use case: Multitask pretraining
5. Use case: Explainable brain age predictions

How can we understand these features?

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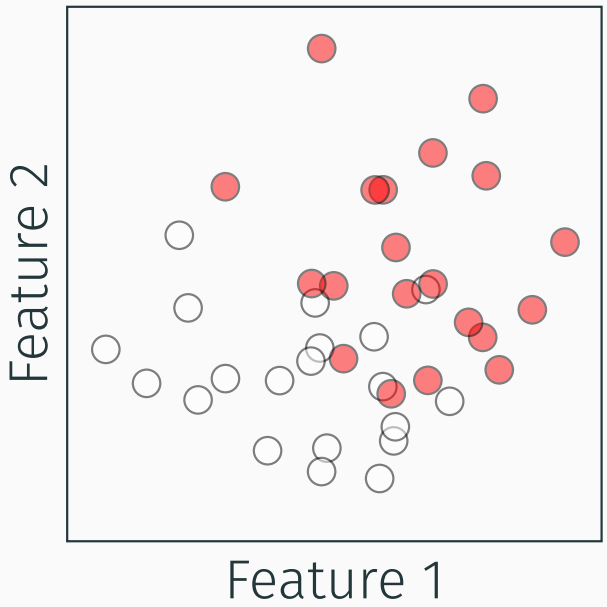
How can we understand these learned features?

Explainable AI!

How can we understand these learned features?



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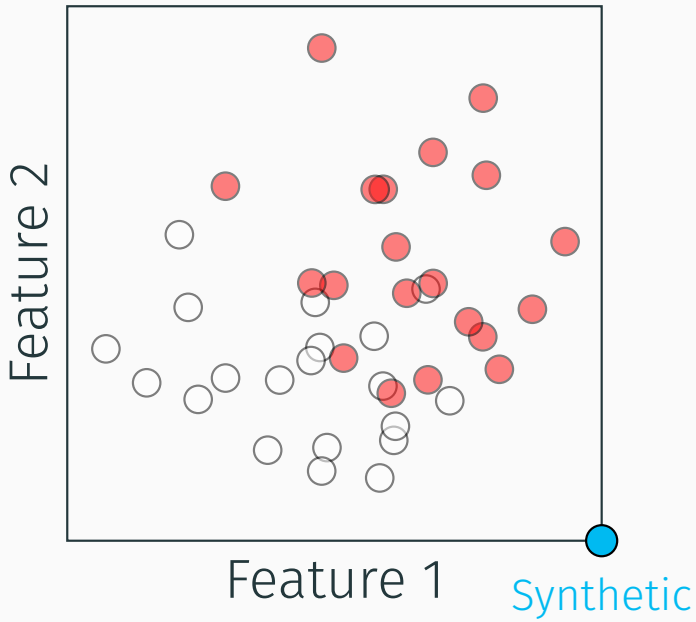

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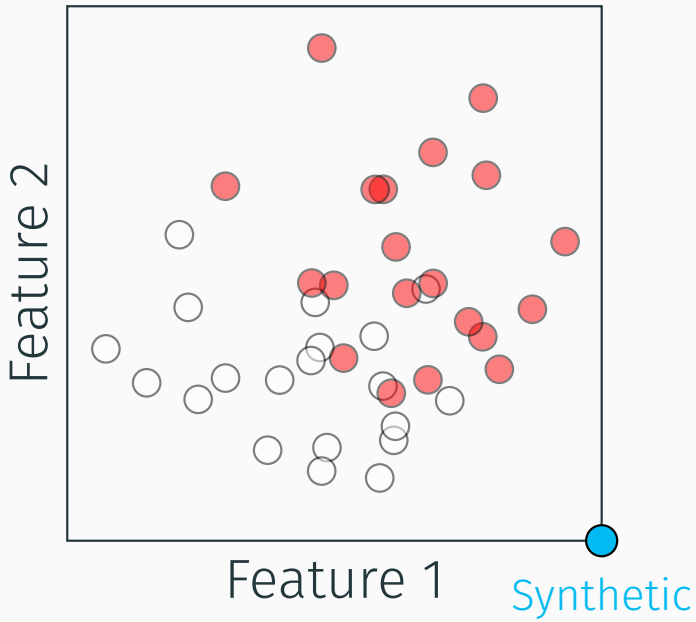

Activation maximization

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Saliency mapping

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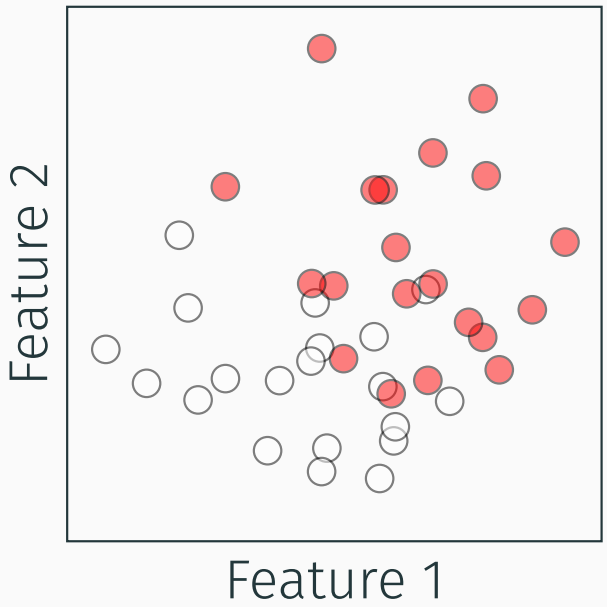

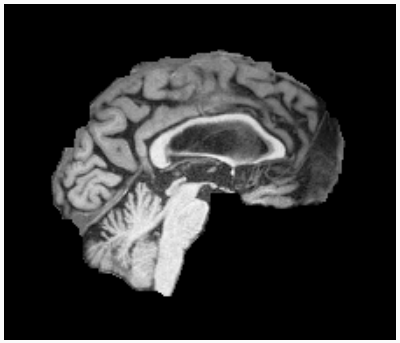

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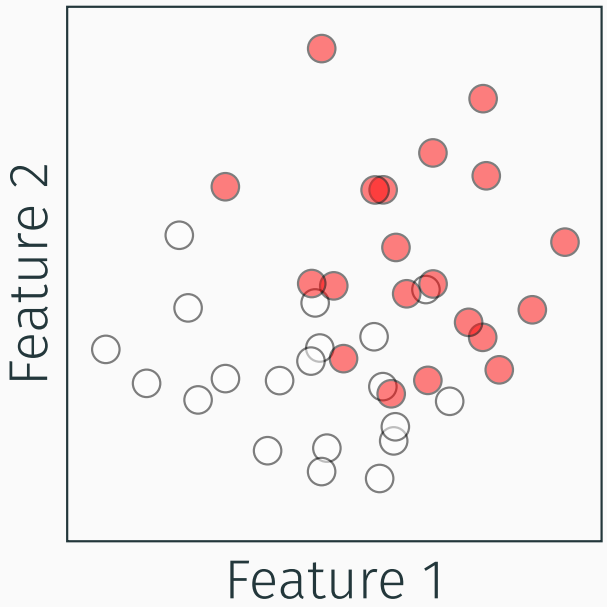

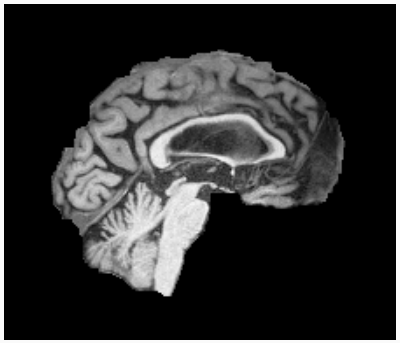

The patient shows cortical atrophy, reduced hippocampal volumes and enlarged ventricles

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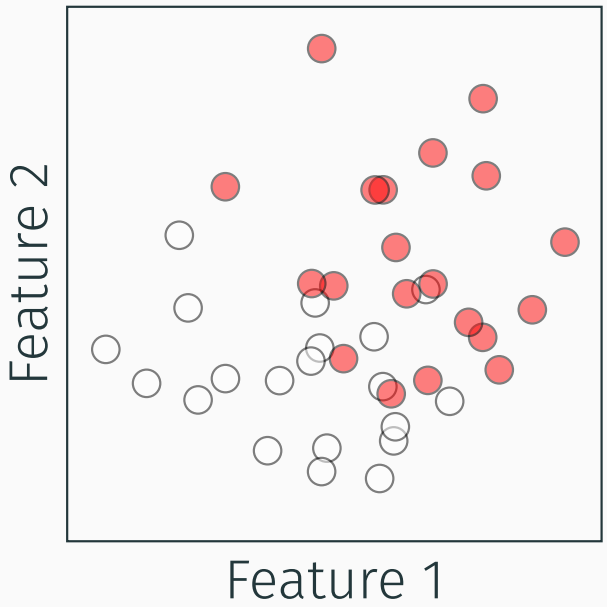

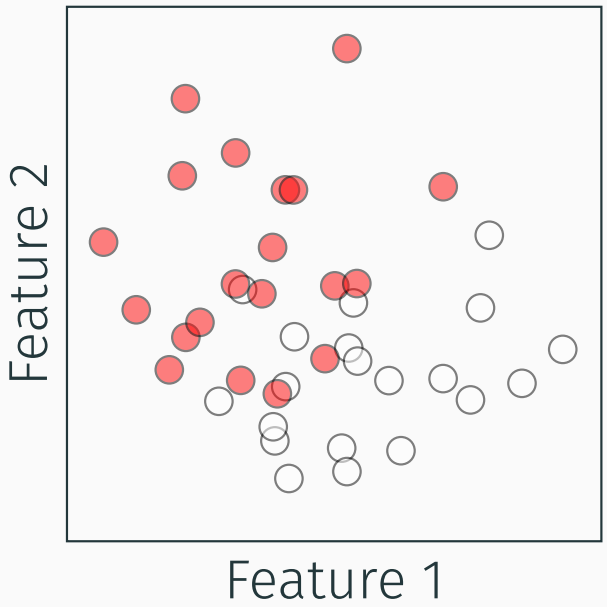

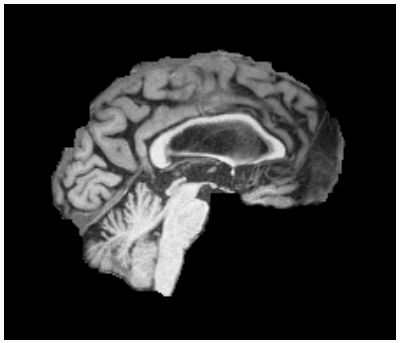

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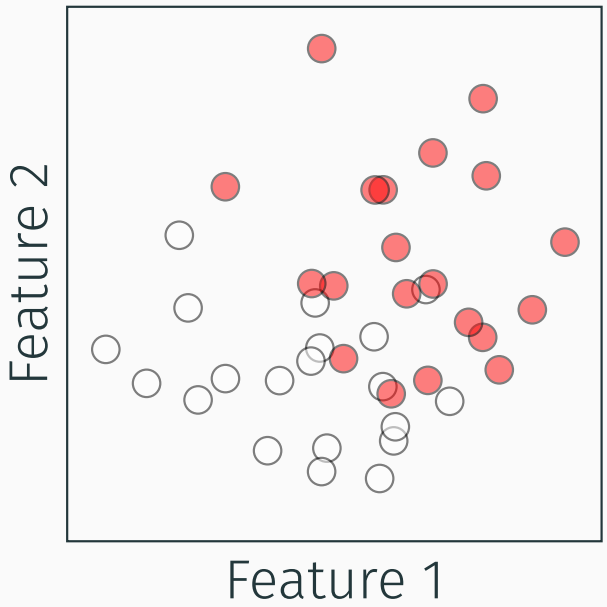

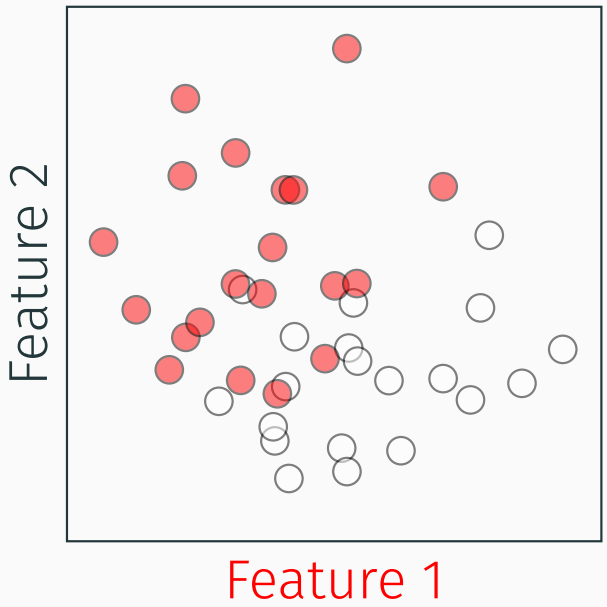

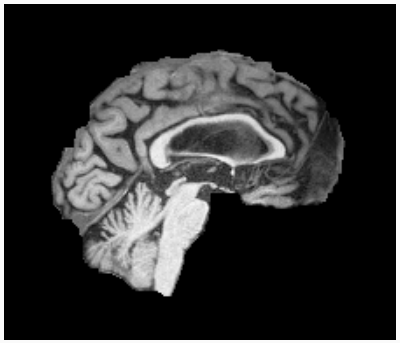

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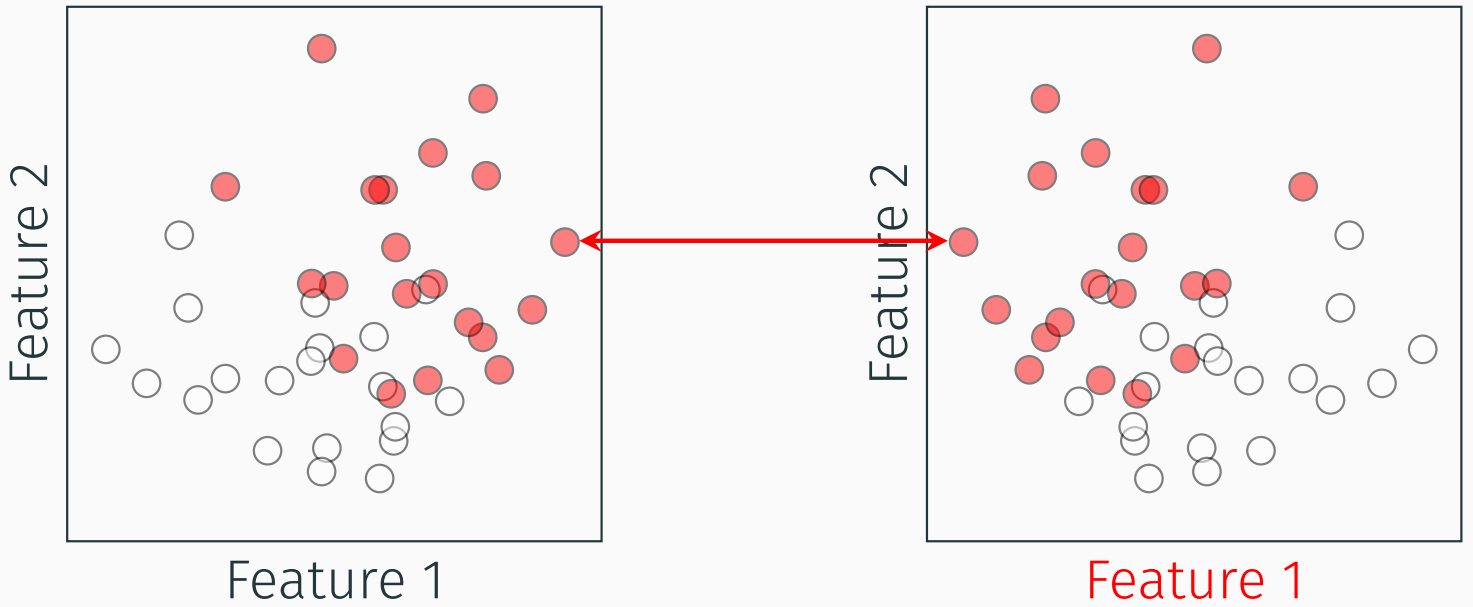

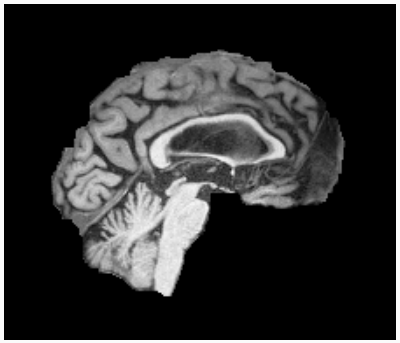

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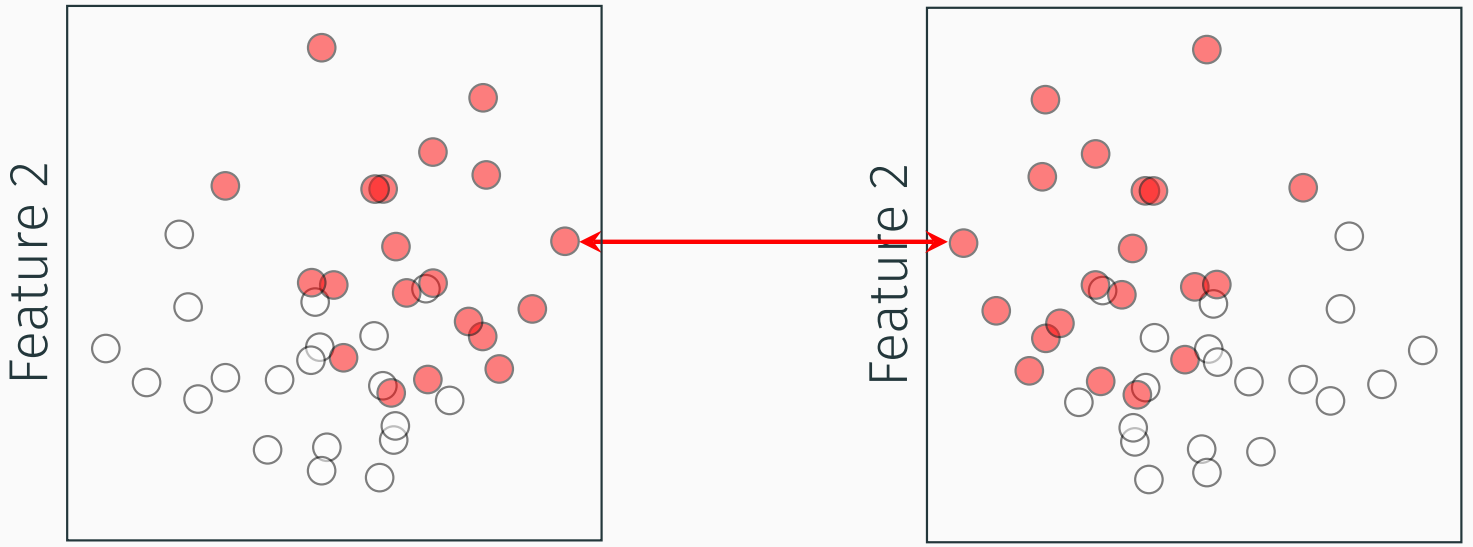

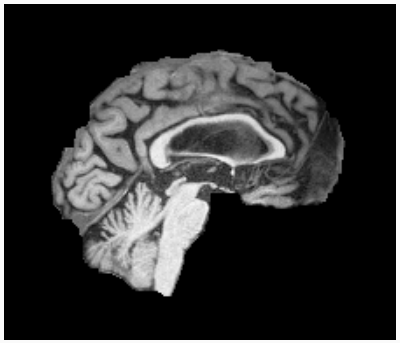

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Thank you!

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