Shapley values and PCA reconstruction error model
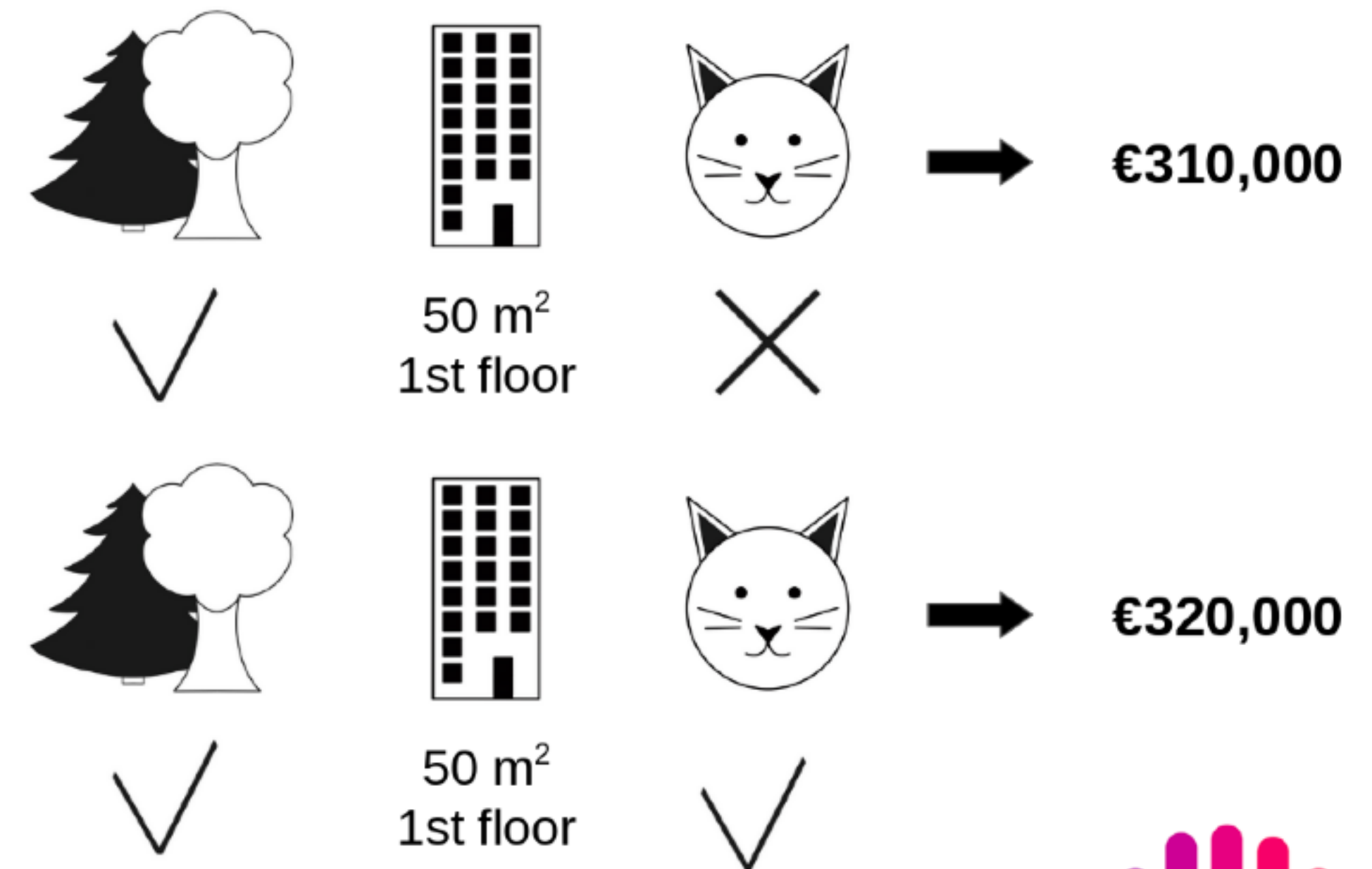
Shapley value: **Average marginal contribution of a feature value across all possible coalitions.**

- Model is tested with iterations of unique coalitions.

- The predicted outcome is computed with and without the feature value of interest for each coalition.

- The mean of the marginal contributions from all iterations is calculated as the Shapley value.

The Shapley value is the average contribution of a feature value to the prediction in different coalitions. The larger the Shapley value, the more it affects the model prediction.

€310,000

50 m²
1st floor

€320,000

50 m²
1st floor

Reconstruction error model:
By considering Shapley values for reconstruction error, we can identify features that lead to higher reconstruction errors in PCA.
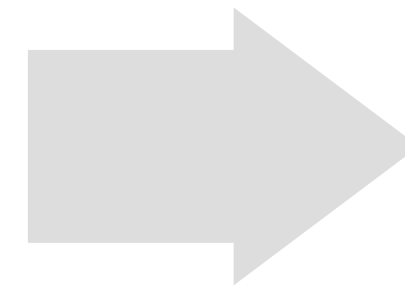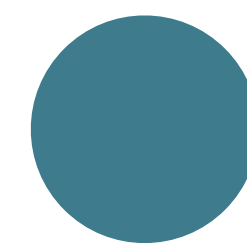
SHAP

Design of study

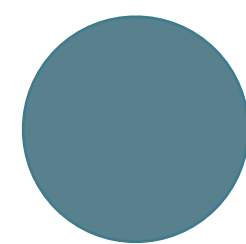25 clinical features

Baseline PCA

Feature selection using Shapley value reconstruction error model.
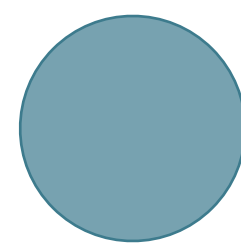Identifying features causing the supra threshold reconstruction error (x)
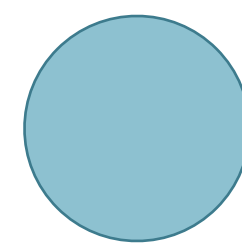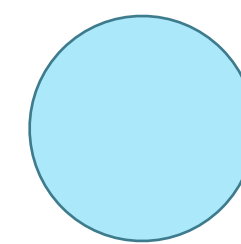
25 - x clinical features

PC1   PC2   PC3   PC4   …   PCn

Background   Goals   **Methods**   Results   Summary

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Hodaie Lab