

### DOMAIN SCIENCE QUESTIONS

- Can data on human and animal remains be combined to generate an isotope map of a region?
- Can two bioarchaeological data sets be used in the same Gaussian Mixture Model?
- Is the additional attribute "oxygen isotope ratio" in the first dataset necessary for task "provenance analysis"?

### DATA SCIENCE QUESTIONS

- Are two data sets compatible for a given data analysis task?
- Is a subset of recorded attributes sufficient to represent the data's structure?
- How can we measure importance and redundancy of a subset of features for a given task?

### APPROACH

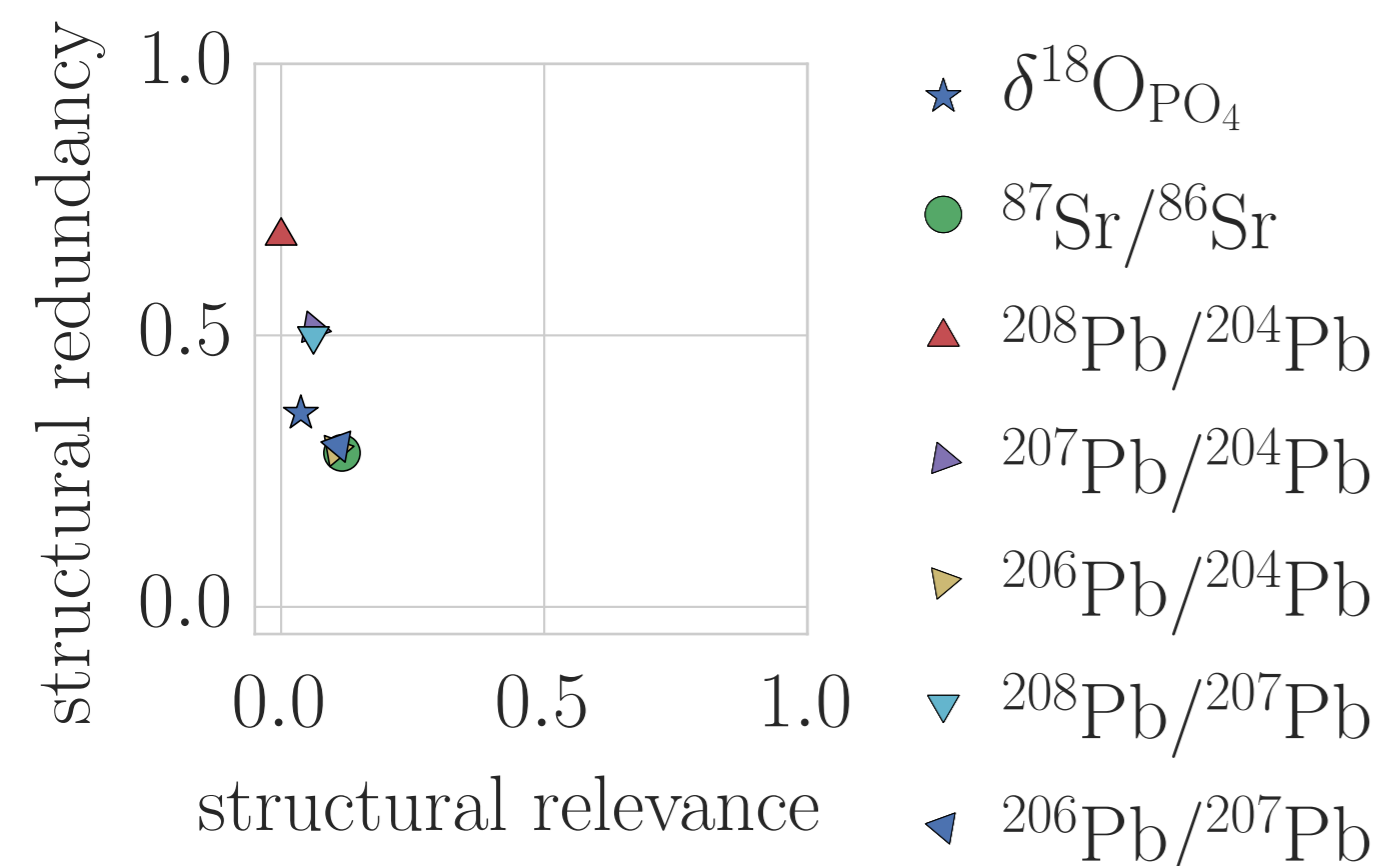
- Create reference attribute set
  - Reflects a "good" result
- Create evaluation attribute set
  - Unknown properties
- Apply target task (e.g. EM clustering)
- Compare results (e.g. ARI)

### EXAMPLE APPLICATION: FEATURE RANKING

- Reference attribute set
  - Contains all attributes in the dataset (including oxygen isotope measurements)
- Evaluation attribute set
  - Same attributes except oxygen isotope ratio
- EM clustering, ARI

### RESULTS

- Oxygen isotopes can be omitted.
- Combined dataset of human and animal remains can be used for analysis.



### FOR1670: RESEARCH UNIT OF THE GERMAN RESEARCH FOUNDATION

Aims to establish an isotopic fingerprint for bioarchaeological finds, especially cremations, and apply it to archaeological and cultural-historical problems of the Late Bronze Age until Roman Times. In the process solve one of the most prominent limiting factors inherent in this type of study which is the overall redundancy of geologically defined isotopic ratios. The data established within this research group is complex and can no longer be managed and analyzed manually. Close interdisciplinary cooperation between all scientists of the research group is necessary, which in the process generates synergy effects.

