# Annotation and data mining for the analysis of alignment

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# Suggestions

- Annotation of relatedness (or relations) between speech units;

- Manual annotation of repeated gestures;

- Distance and alignment: replication of the analysis from Bergmann & Kopp (2012) with relatedness as distance measure;

- Features crucial for gesture repetition: Classification;

- Coocurrence of features: associations;

# Relatedness

- Traum & Heeman (1997);

- Utterance units in dialogue can introduce completely new content (unrelated) or be related to a previous utterance of the interlocutor; distance is defined as the number of units between the related ones;

- Connected with given-new distinction and grounding – both may affect alignment (strategic or higher-level alignment,;Kopp & Bergmann, 2013; Semin & Cacioppo, 2008; Mol, Krahmer, Maes & Swerts, 2011);

- Hypothesis: greater alignment between related than unrelated units; repetitions may be affected by the distance;

# With relatedness...

- Replication of analysis schema from Bergmann & Kopp (2012); ANOVA with relatedness distance as a group variable;

- ... with manual annotation of repetitions...

- the easiest analysis will be Chi-squared test: number of repetitions and „unique" gestures coocurring with related and unrelated (new) units;

# Manual annotation of repetitions

- „Expert system" approach;
- In a part of the data experts mark gestures that seem to be repeated accross the dialogue (within one speaker and between the speakers);
- From each dialogue annotation of the „original" gesture and its „copies" are extraxted...
- and analysed with classification algorithms (decision trees) to create a model of repetition;

# Classification

- Class: gesture type (each repetition belongs to the same type as the „original" gesture);

- May provide a model of repetition: preservation of which features enables marking a gesture as a copy of a previous one;

| handedness | handshape | palm and fingers | wrist movement | representation technique | class |
|---|---|---|---|---|---|
| left | ... | ... | ... | shaping | gesture1 |
| right | ... | ... | ... | posturing | gesture2 |
| both | ... | ... | ... | shaping | gesture1 |
| right | ... | ... | ... | shaping | gesture2 |

# Classification: decision tree

- Significance measure: accuracy of classification (succes rate, proportion of correct classifications);
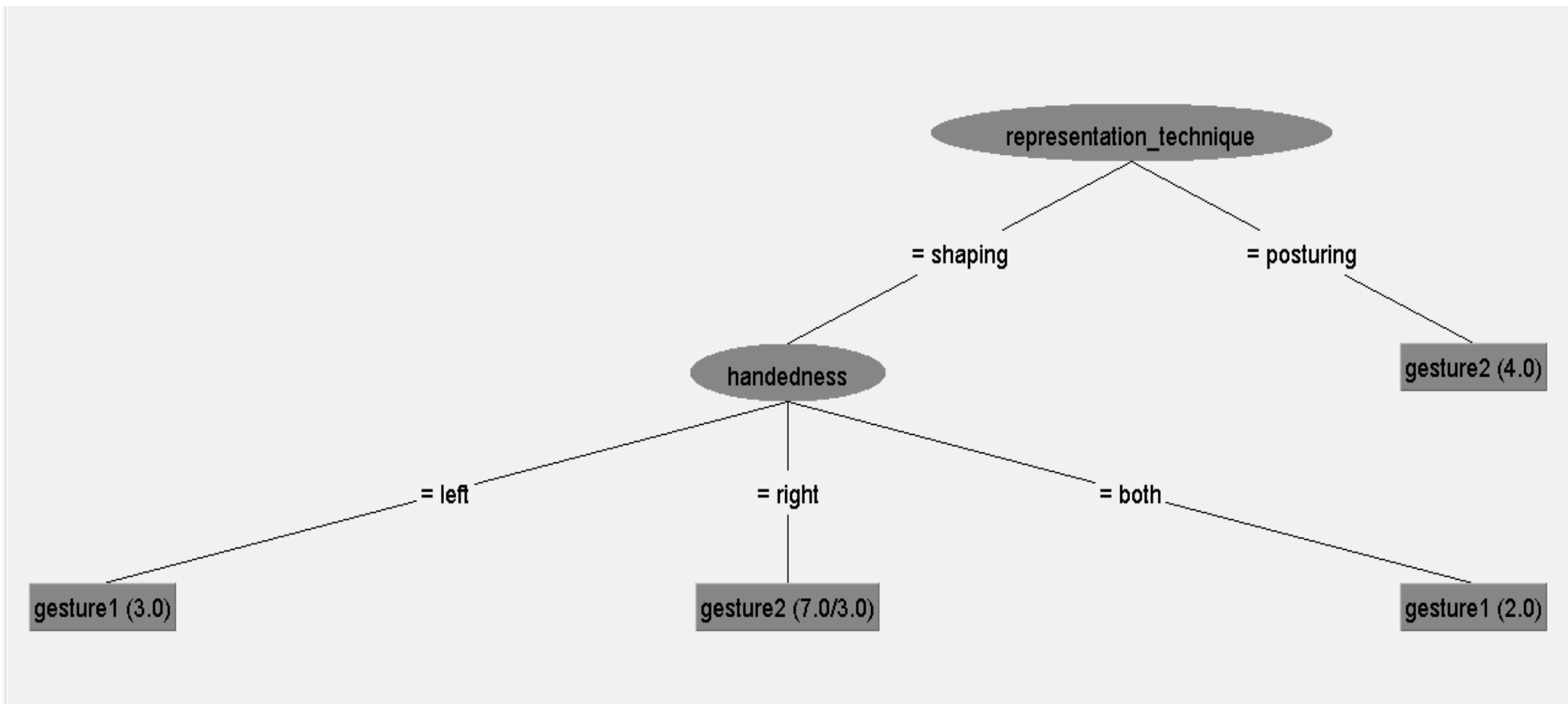
# Association

- Algorithms producing a set of rules indicating coocurrences between given values of all the variables measured;

- For the example analysed before:

```
handedness=left 3 ==>
representation_technique=shaping 3
conf:(1)
```

- Significance measure: confidence (conf): number of cases in the antecendent vs number of cases in the consequent; confidence=1 means 100% accuracy of the rule;

# Association: what for?

- Data reduction (overlapping variables);

- May indicate relations omitted during stating hypotheses;

- Serves as a preliminary data analysis for eliminating hypotheses that are not supported;

# Literature

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