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Facet Analysis and Semantic Frames

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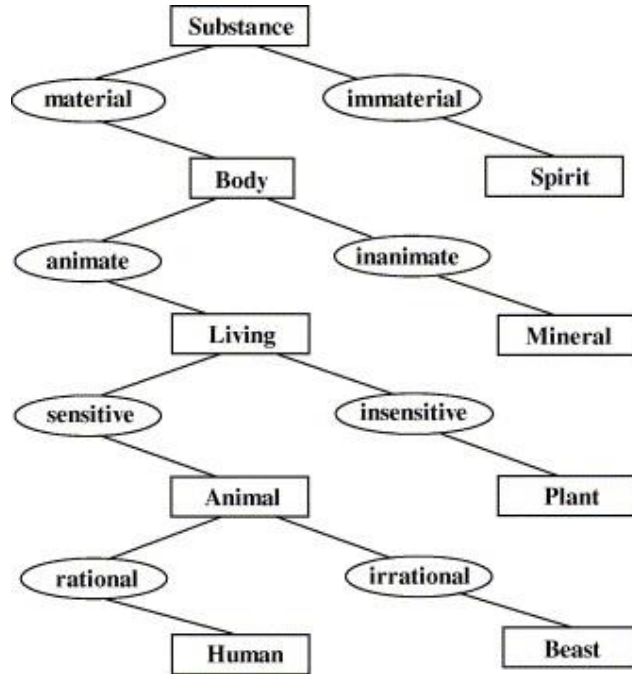
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Facet analysis vs. semantic frame analysis

- What is the nature of the conceptual structures that they identify?
- How similar are the techniques they use?
- How similar are the conceptual structures they produce?
- Are facets and frame elements essentially the same thing?

NATURE OF THEIR CONCEPTUAL STRUCTURES

Facets



- Top-level characteristics of division by which vocabulary of field is derived from overall field
- Logical / semantically cohesive categories underlying vocabulary of field

Semantic frames

- Script-like conceptual structures that describe particular types of situations/objects/events along with their participants and props
- Participants and props are frame elements
- Situations/objects/events are gestalts, in which understanding any element of frame is dependent on understanding all other elements of frame

Semantic frame example

- Sentencing frame (subframe of Criminal process):
Sentence is imposed on Convict by Court (often represented by Judge) for Offense
- Judge Duncan SENTENCED Marty to five years in prison for illegally smuggling protected reptiles.

ANALYTIC TECHNIQUES

Facet analysis

- Identify terms from field's literature (e.g., article titles, glossary entries, textbook, subject heading list)
- Semantic factor terms to identify underlying semantic components
- Organize into groups, based on characteristics of division that differentiate each term
- Highest-level groups at end are the facets

Frame semantic analysis

- On basis of corpus evidence, identify word senses that can be used to talk about the same situation
- Annotate sentences containing these word senses to identify semantic roles played by noun phrases syntactically related to verbs that evoke frame / to identify predicate-argument structure on semantic level
- Recurring semantic roles are identified as frame elements

Frame semantic analysis example

- VERDICT frame: A **Judge** gives a **Finding** with respect to the **Charges** against the **Defendant**.
- Sample annotated sentences:
 - **Yew** **ACQUITTED** and discharged **the accused** on **all charges**.
 - **A Brazilian court** has **CONVICTED** **a logger** of **operating illegally on Indian land**.
 - **An Old Bailey jury** **FOUND** **the woman** **not guilty** of **child cruelty**.
 - **A Spanish Supreme Court judge** **CLEARs** **Prime Minister Felipe Gonzalez** of **involvement in the assassinations of Basque separatists during the 1980s**.

COMPATIBILITY OF RESULTS

Performing arts

- Form of art
- People
 - Creators
 - Technicians
 - Performers
 - Audience
- Production
- Processes and techniques
- Subject
- Style
- Space and time

From Antony Croghan faceted classification

- Type of performance (e.g., film)
- [Behind-the-scenes] Personnel (e.g., writers, producers, stage hands)
- Performer
- Audience
- Performance
- Medium (channel through which performance is transmitted)
- Score
- Script (directions for performers)

From FrameNet Performing_arts frame

Education

- Educands
- Schools
- School, college and university officers
- Curriculum
- School, college and university management
- Teaching aids
- ...

From London Education Classification

- Student
- Institution
- Teacher
- Subject
- Skill
- Fact
- Precept
- Course
- Educational material
- ...

From FrameNet Education_teaching frame

Education—cont.

- Students' work
- Teaching profession
- Educational psychology and measurement
- School buildings
- Equipment

- Qualification (e.g., degree, certificate)
- Professional or vocational role (goal of training)

From London Education Classification

From FrameNet Education_teaching frame

FACETS = FRAME ELEMENTS?

Similarities and differences

- Both seek semantic roles / logical categories
- Both derived from textual input, but . . .
 - Facet analysis
 - Analyzes terms in (usu. technical, scholarly) literature; caters to business, professions, academia; specialized by subject
 - Used to organize literature
 - Frame semantic analysis
 - Analyzes sentences from balanced corpora; caters to diverse array of people, ordinary folks; specialized by linguistic phenomena
 - Used to inform NLP tools

thank you

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