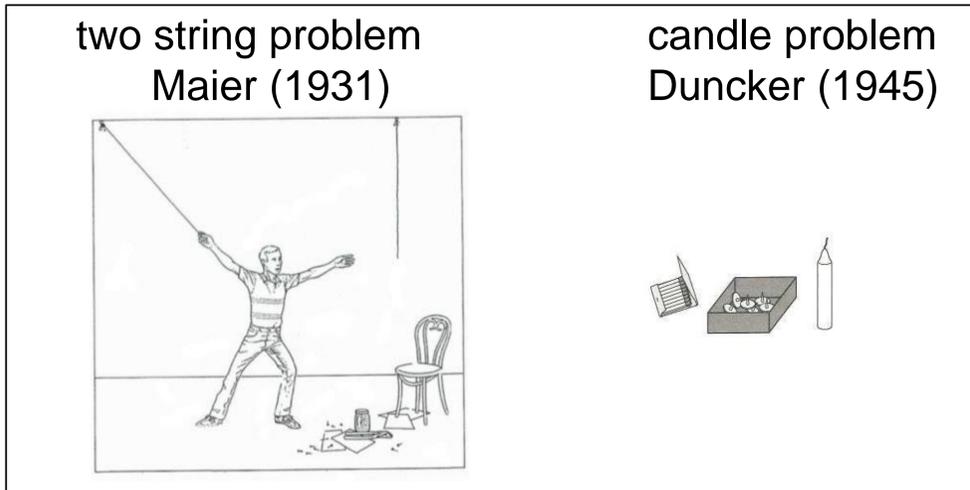


# Towards affordance-based solving of object insight problems

Ana-Maria Oltețeanu, Christian Freksa

## Practical object-related problem-solving with incomplete knowledge and incomplete toolset

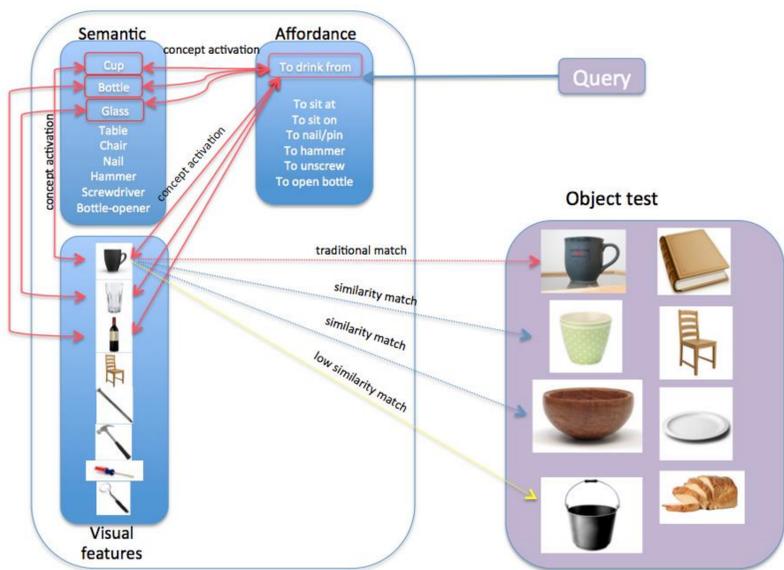


- Humans can use knowledge about affordances creatively to solve problems
- Cognitively-inspired (creative) affordance inference mechanisms
- More robust, flexible, independent artificial systems
- **Make new affordance hypotheses**
- **Construct new objects**

### Three levels

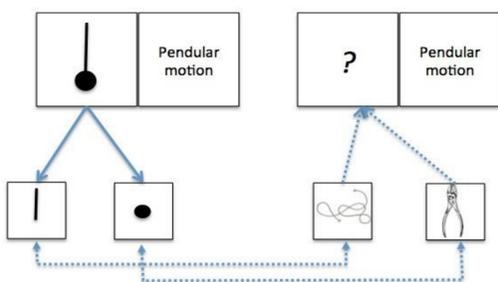
#### I. Simple object replacement creative problems

- Problem form – agent needs an object (for a specific affordance), object is not present
- Task – search for “creative” object replacement

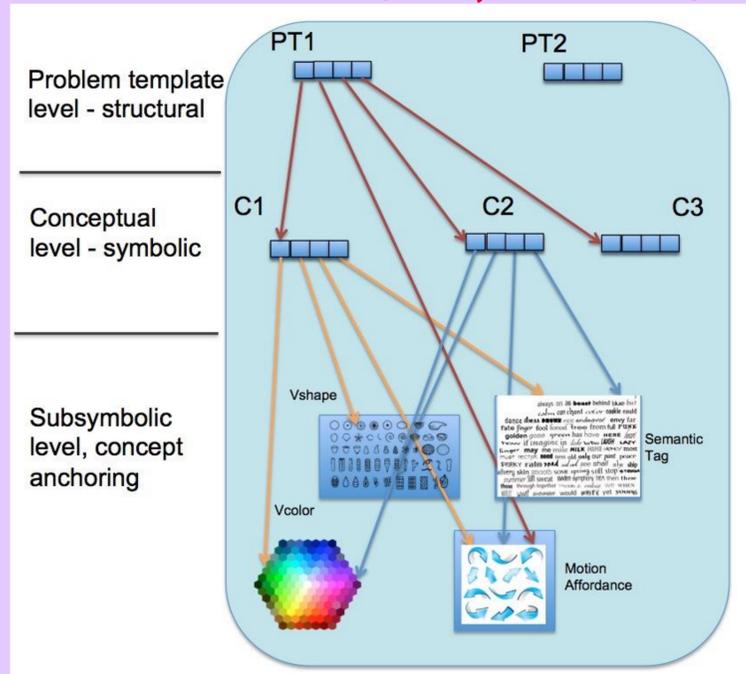


#### II. Object composition problems

- Agent needs a certain object, but neither the object nor a direct replacement can be found in the environment
- Task: Compose object out of similar object parts
- Object part encoding and re-representation



#### The framework (Oltețeanu 2014)



- subsymbolic level is used for grounding and for the search of objects with similar features as the ones given, on various dimensions
- structured representation provides the ability to switch between the various objects used to solve the problem (in previous experience), navigate between different possible interpretations of the problem, and try to compose new objects.

#### III. Object composition insight problems (wrapped problems)

- Problem re-representation + Object re-representation
- String problem:
- Elongate object/Move object towards self **to** Object should move towards self (insight) + Construct object capable of pendular motion

#### Contact

[amoodu@informatik.uni-bremen.de](mailto:amoodu@informatik.uni-bremen.de)  
[freksa@uni-bremen.de](mailto:freksa@uni-bremen.de)