TAILOR
WP 4 - Paradigms & Representations
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CONSTRAINTS
(CSPs, CP, OR)

PROBABILITY

LOGIC

NEURAL

EMBEDDINGS
WP 4
Different AI paradigms and representational paradigms

- Goals:
  - integrate these paradigms
  - integrate the involved communities
- Focus is on the **static** case, i.e., no time, no action, no dynamics, just like in a database
- Covers five core different communities including
  - Deep & Probabilistic Learning
  - Neuro-Symbolic Computation (NeSy)
  - Statistical Relational AI (StarAI)
  - Constraint Programming & Machine Learning
  - Knowledge graphs for reasoning
  - And apply ... in e.g. computer vision
Two main paradigms for reasoning are generally accepted as the two main paradigms for reasoning.
Reasoning

Two main paradigms for reasoning:

- Probability
- Logic

Generally accepted as the two main paradigms for reasoning.
THREE DIFFERENT PARADIGMS FOR LEARNING
(there are two more — evolutionary and analogical, not tied to particular representations)
Community 1

A lot of Deep Learning
A lot of Deep (Probabilistic) Learning

THE POINT IS — A LOT OF ML FITS HERE
Community 2

Neuro Symbolic Computation

LOGIC

NEURAL
Community 3

Knowledge graphs and ontologies

LOGIC

NEURAL

EMBEDDINGS
Community 4

PROBABILITY

LOGIC

Statistical Relational AI (StarAI) and Probabilistic Programming
Community 5

Constraint Programming & Machine Learning
e.g. Empirical Model Building (Milano @ IJCAI 19)
WP 4
Different Tasks

• Task 4.1: Integrated representations for learning and reasoning

• Task 4.2 Integrated approaches to learning and optimisation

• Task 4.3 Learning and reasoning with embeddings, knowledge graphs, & ontologies

• Task 4.4: Learning and reasoning for perception, spatial reasoning, and vision
Integrate

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NEURAL PROBABILITY

LOGIC

CONSTRANTS (CSPs, CP, OR)

EMBEDDINGS