TAILOR
WP 4 - Paradigms & Representations

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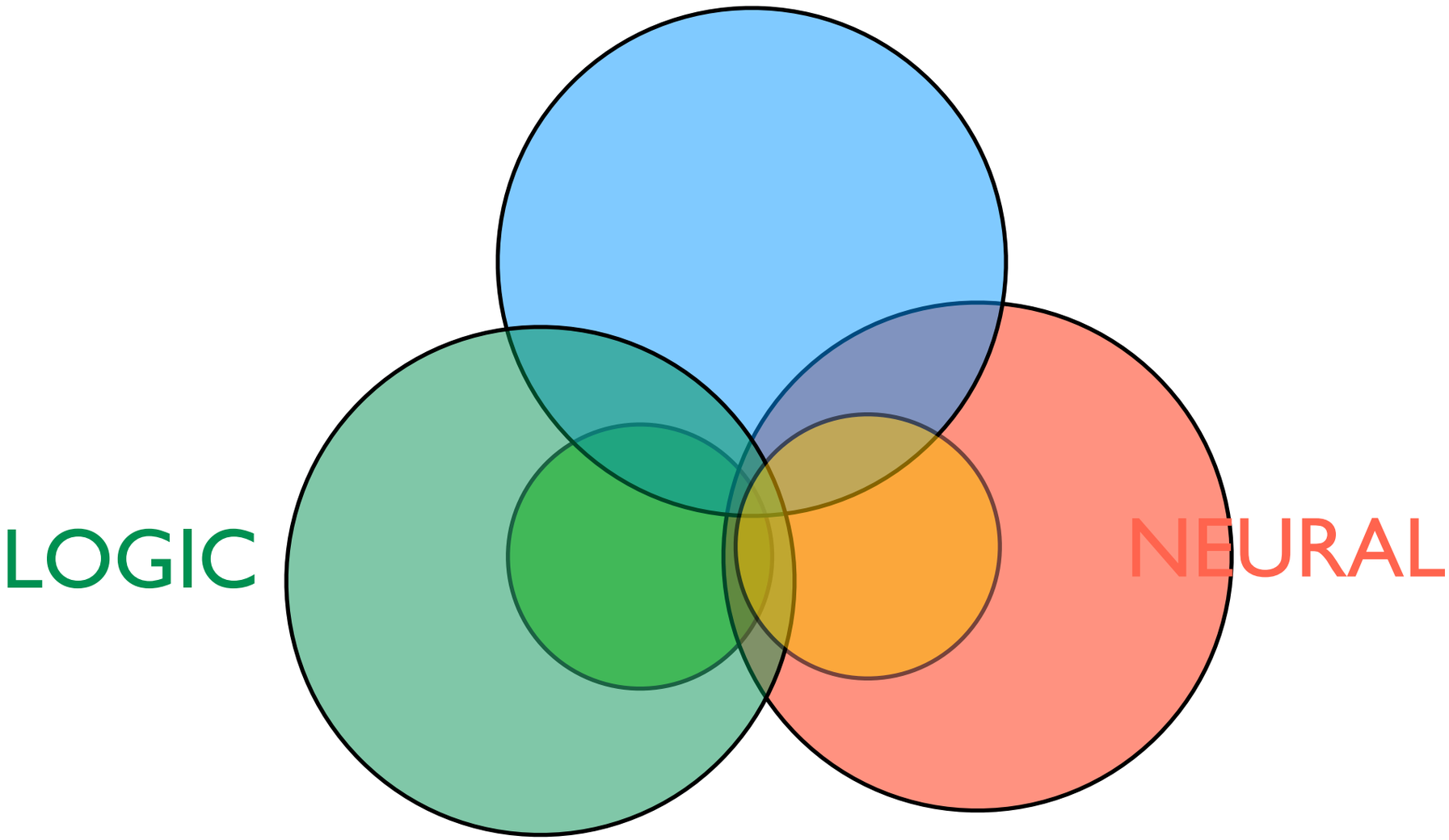
PROBABILITY



LOGIC

NEURAL

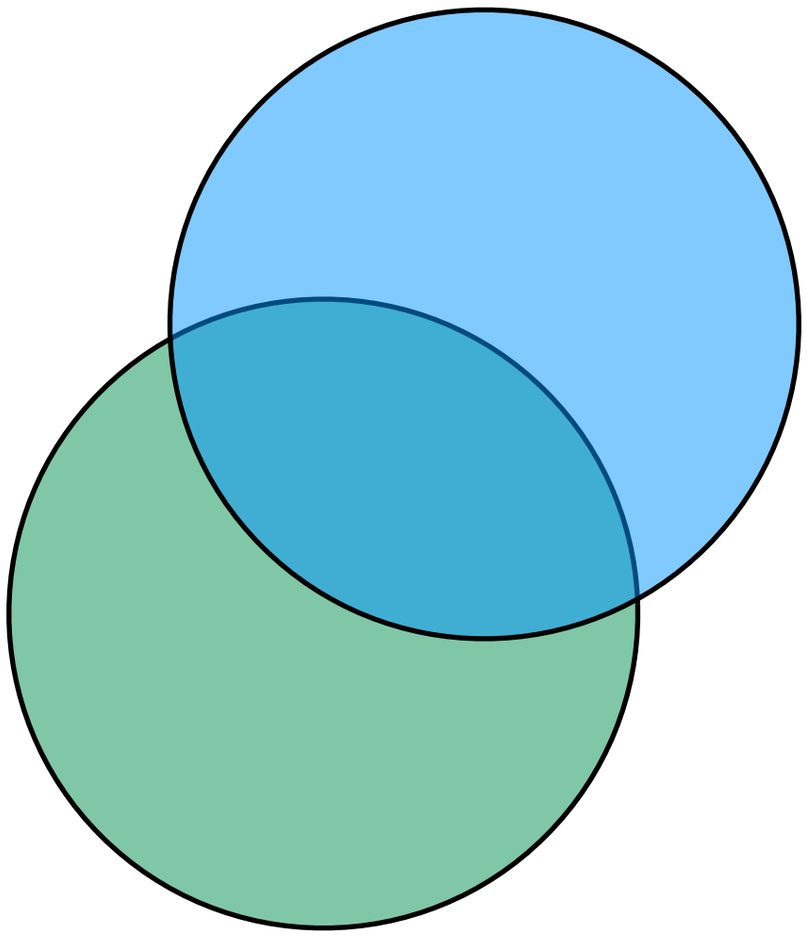
CONSTRAINTS
(CSPs, CP, OR)

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

Reasoning



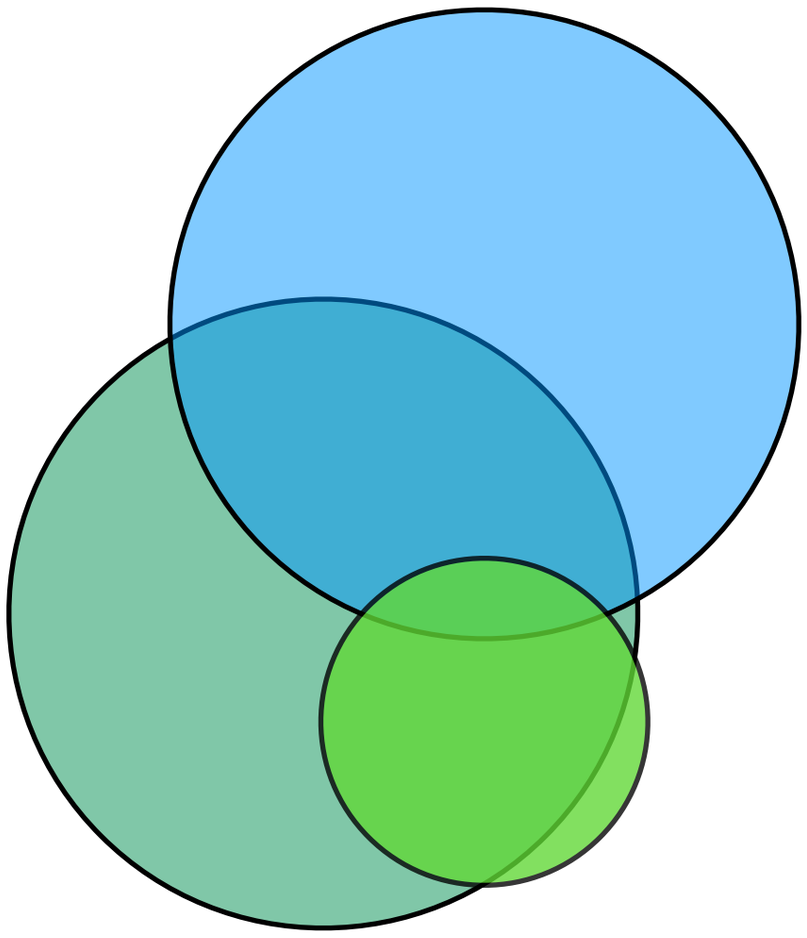
PROBABILITY

LOGIC

Generally accepted as the

TWO MAIN PARADIGMS FOR REASONING

Reasoning



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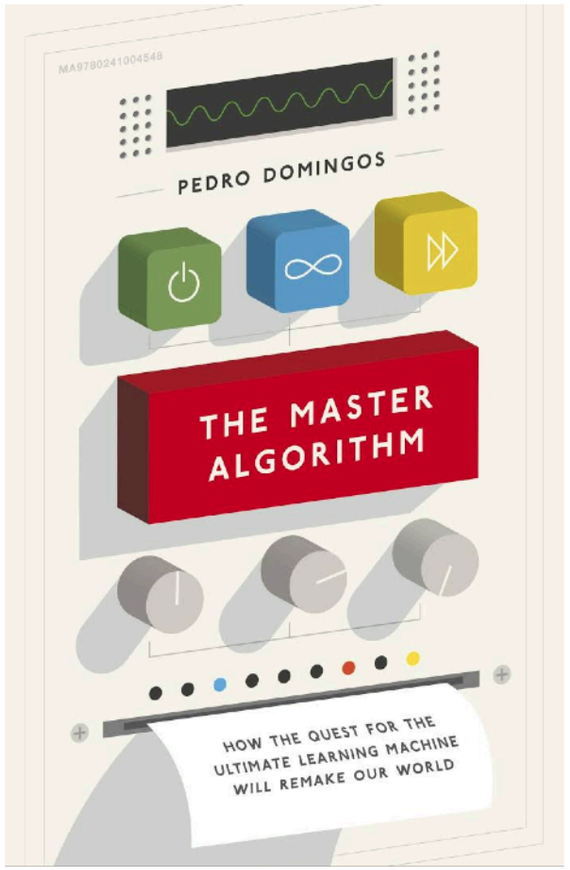
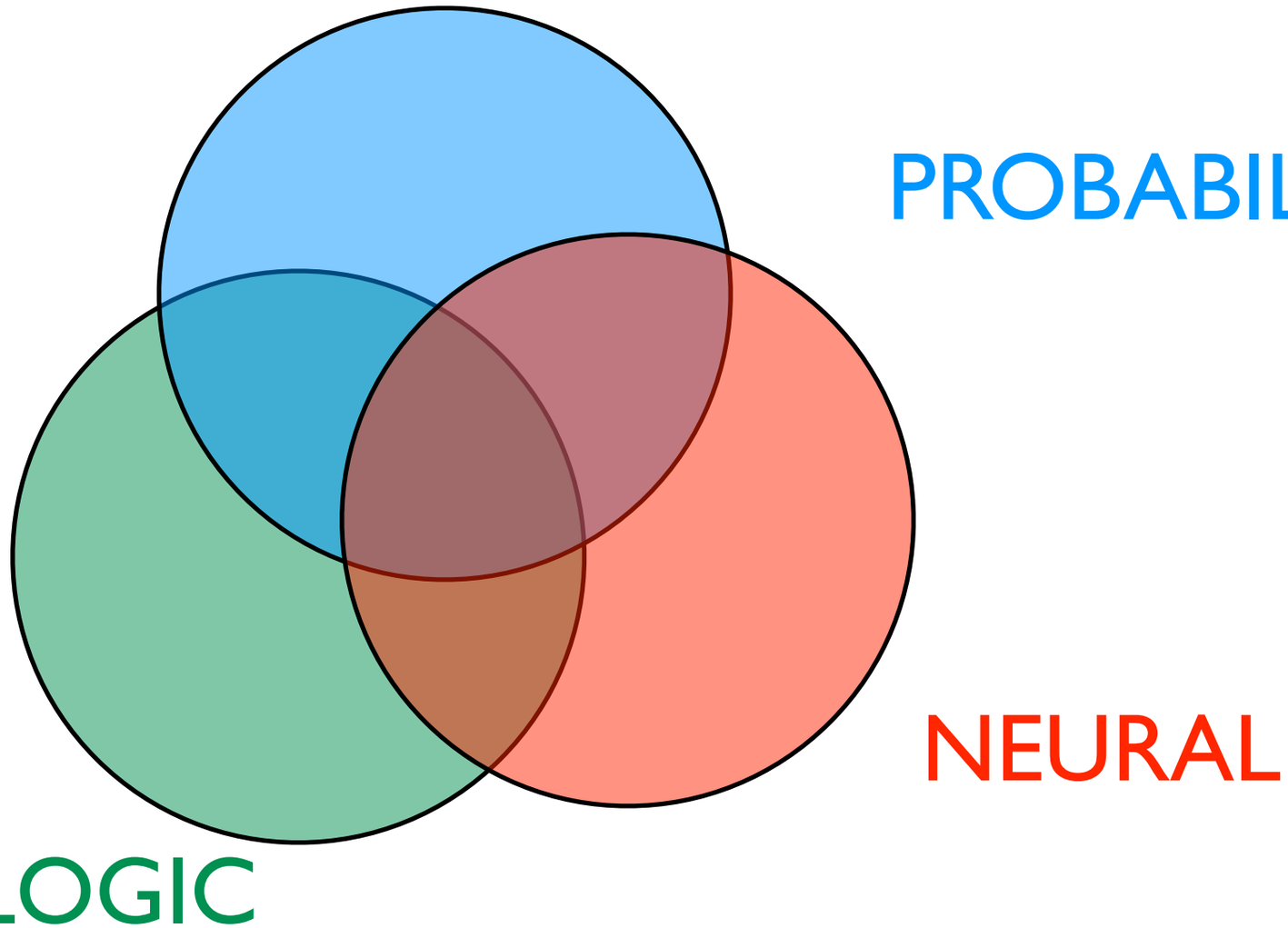
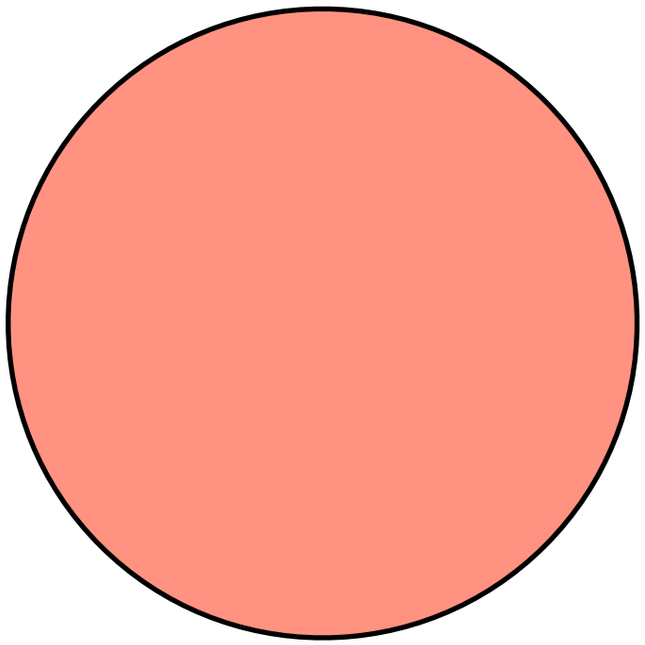


Learning



THREE DIFFERENT PARADIGMS FOR LEARNING
(there are two more — evolutionary and analogical, not tied to particular representations)

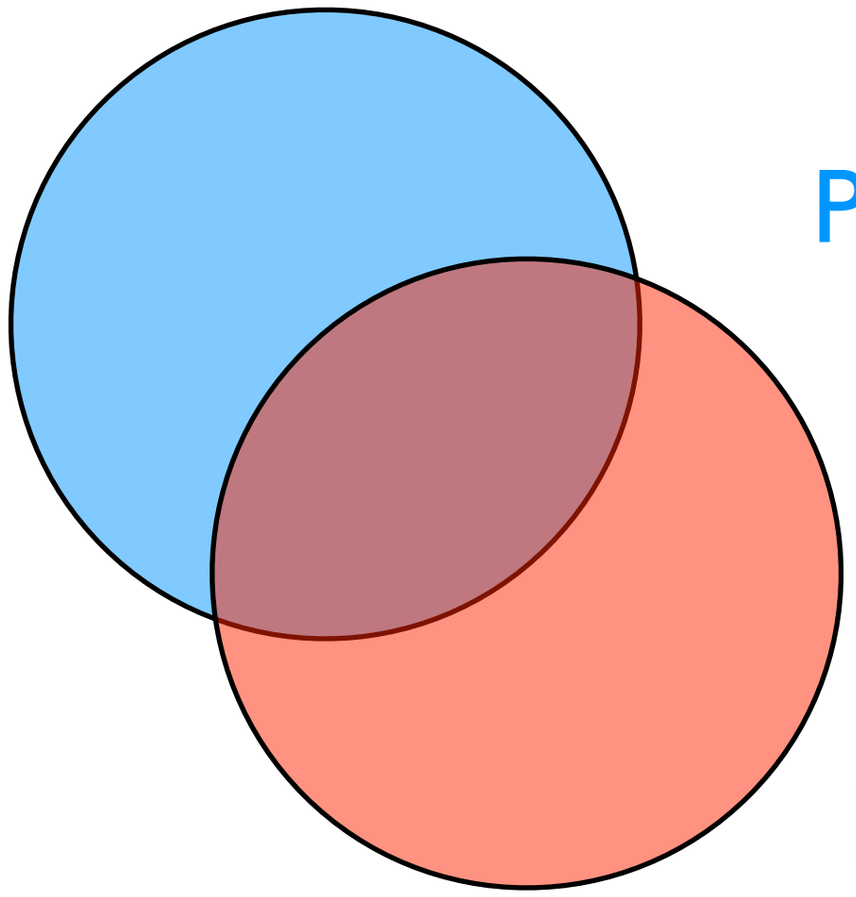
Community 1



NEURAL

A lot of Deep Learning

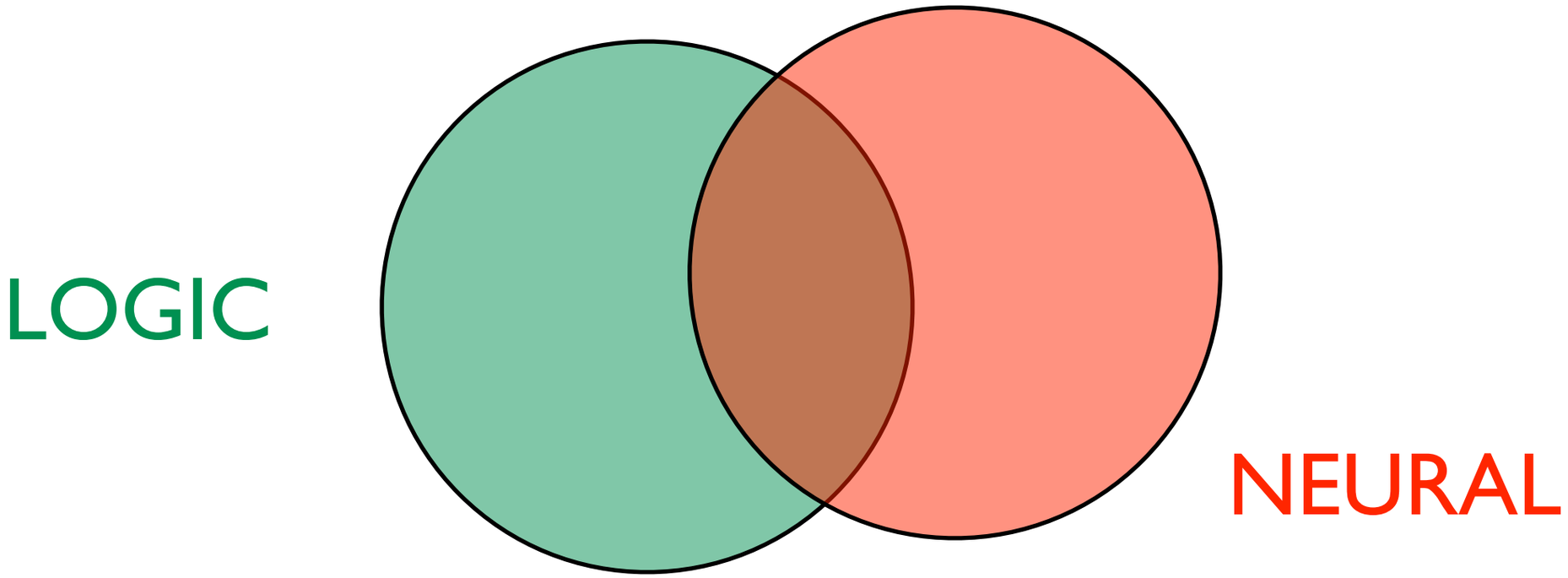
Community 1



A lot of Deep (Probabilistic) Learning

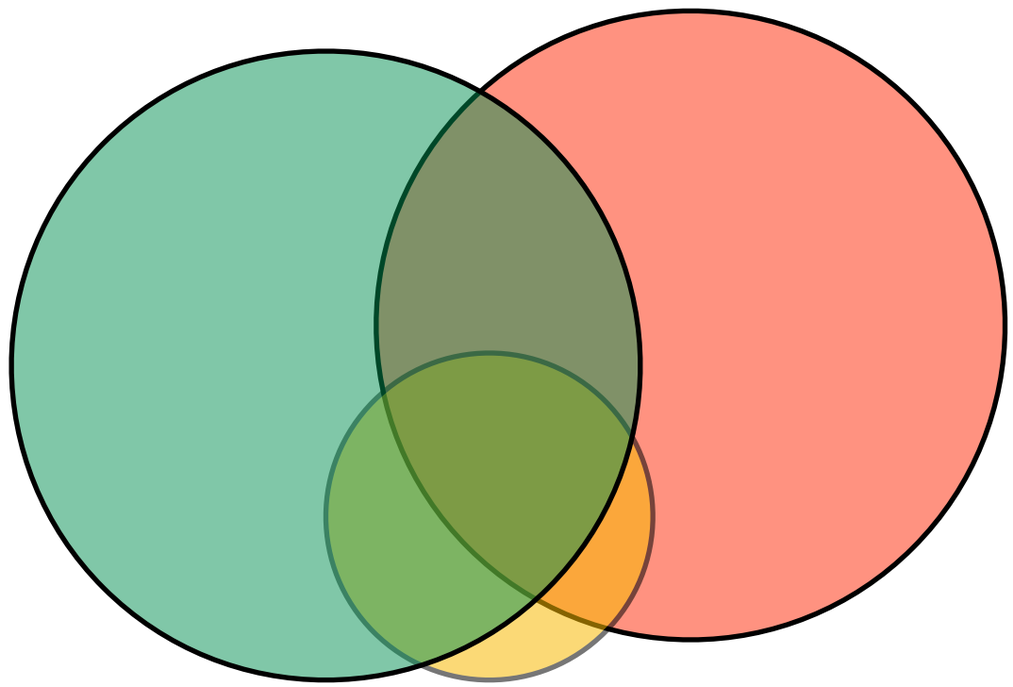
THE POINT IS — A LOT OF ML FITS HERE

Community 2



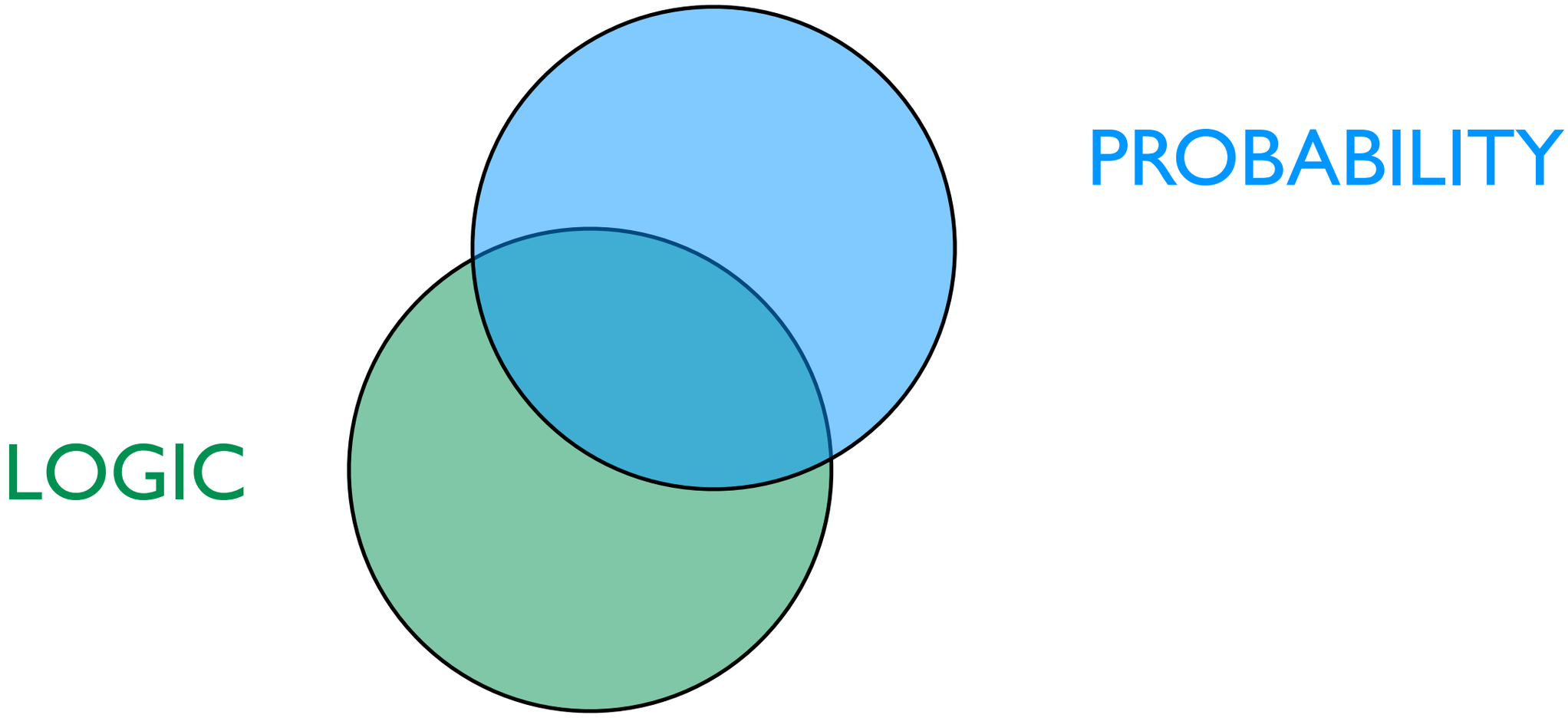
Neuro Symbolic Computation

Community 3



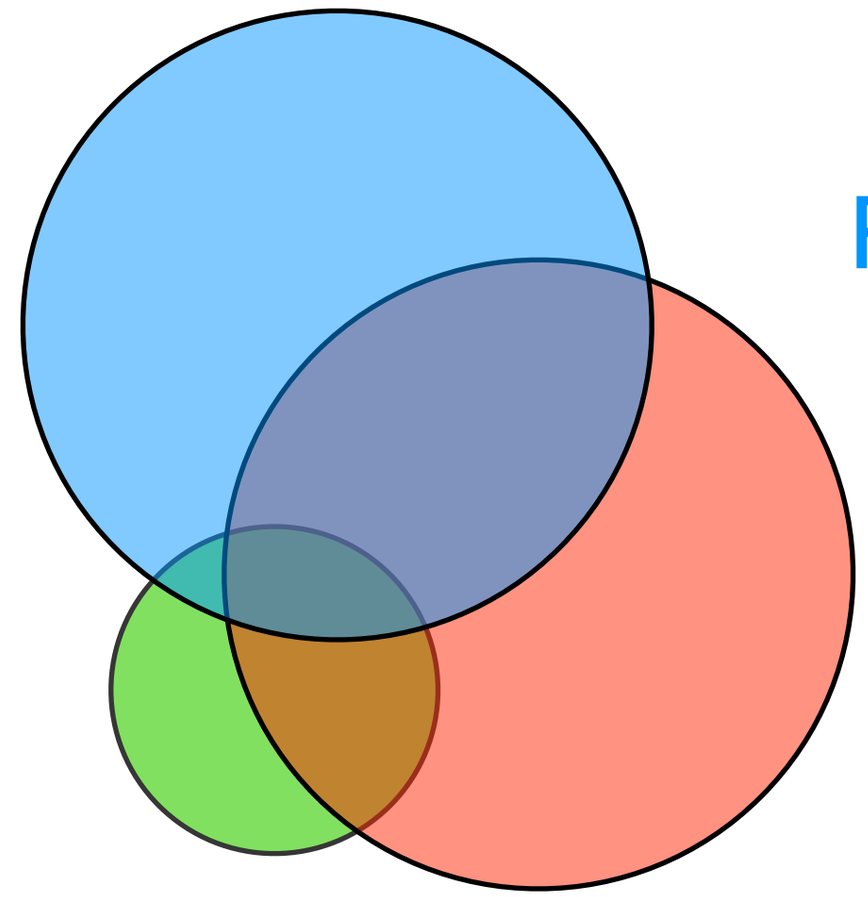
Knowledge graphs and ontologies

Community 4



Statistical Relational AI (StarAI)
and Probabilistic Programming

Community 5



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

WP 4
Different Tasks

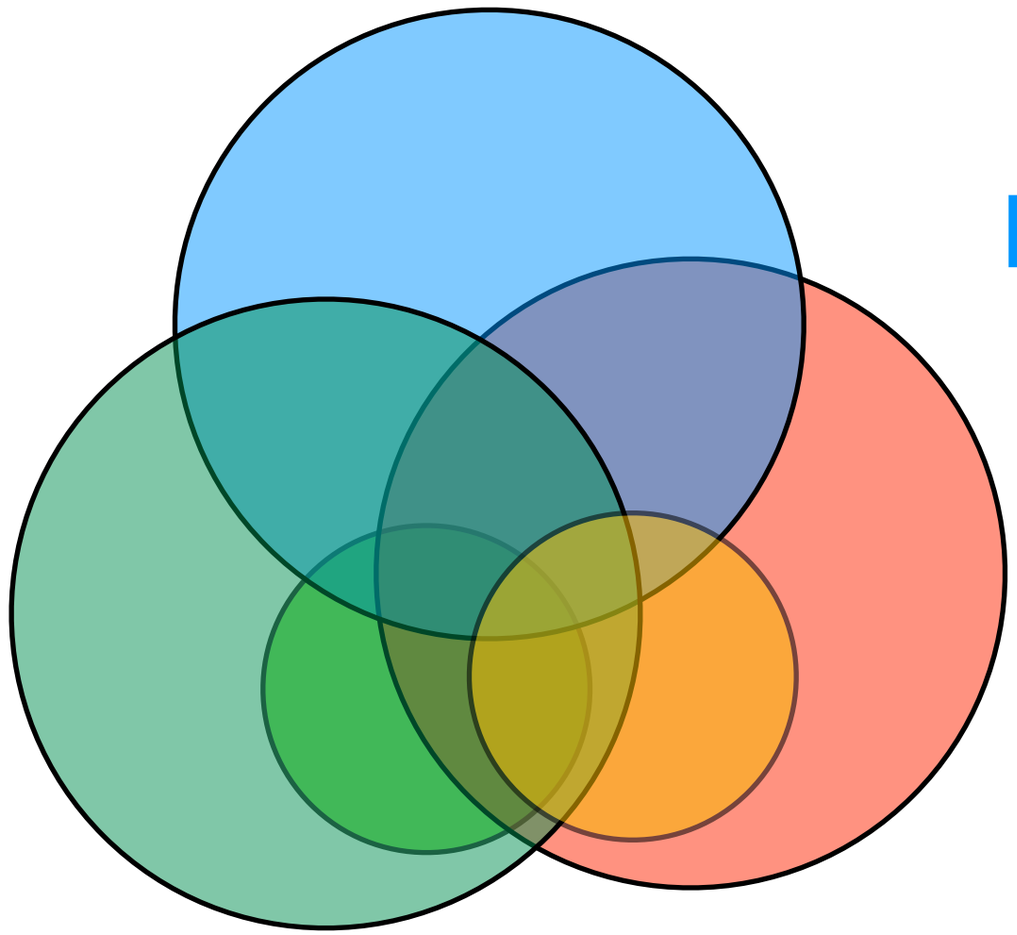
- Task 4.1: Integrated representations for learning and reasoning

- 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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