Many Valued Logic Programming - Implications Versus Clauses

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In this talk we discuss the theory of logic programming in various many valued logics.

Because in many valued logic clausual notation is not always equivalent to rules understood as implications, we discuss both possibilities separately.

For logic programs with rules being implication (so called IF_THEN rules) we introduce a declarative and procedural semantics and give conditions on connectives under which soundness and completeness hold. Our approach is based on the evaluation of the backward usage of many valued modus ponens by residual conjunctors and a fixpoint theory for many valued Herbrand interpretations.

The fixpoint theory and especially properties of the many valued T_P operator have consequences in the theory of many valued knowledge based data systems and datalog. We mention possible applications for flexible querying using many valued equalities.

For many valued clausal logic programs we introduce a general many valued resolution and discuss connectives for its evaluation under which this is a sound deduction rule. We discuss the problem of semantics for such programs and possible completeness result.

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