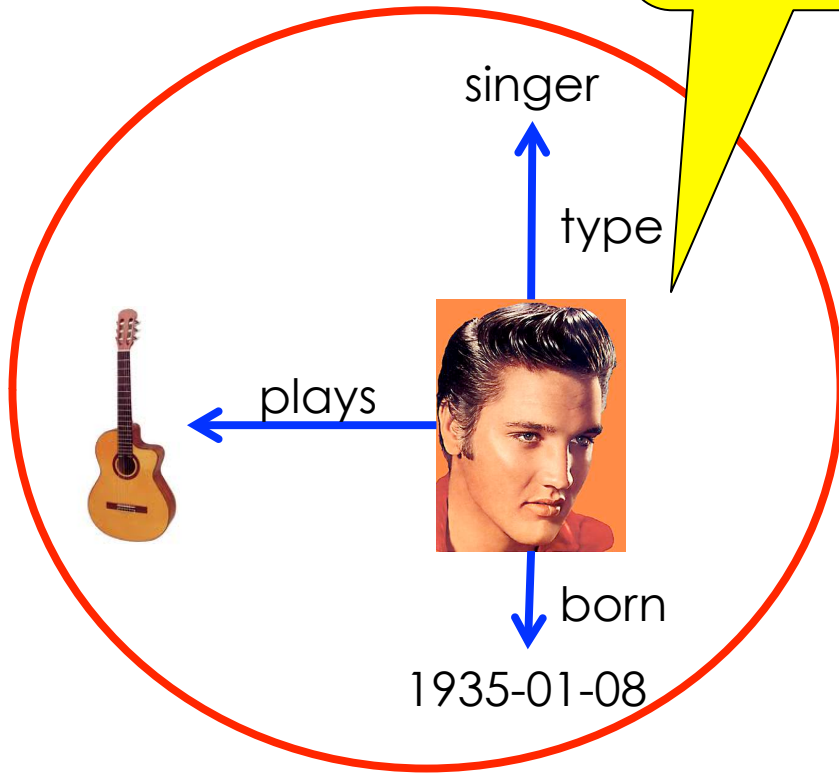# Ontology Matching

or: *New stories from Elvis*
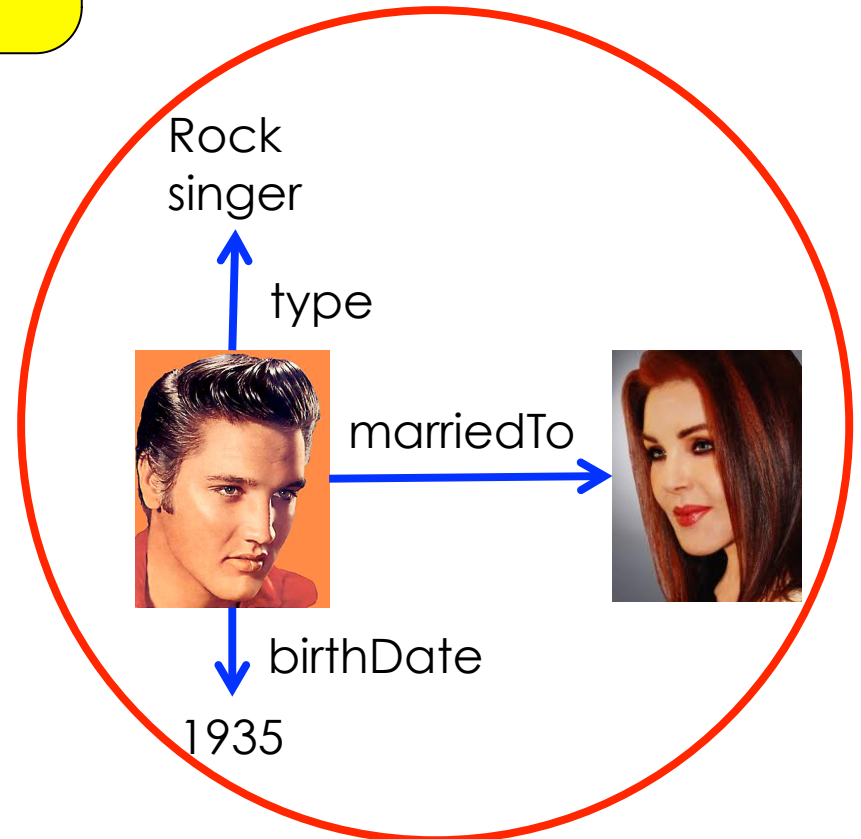
Fabian M. Suchanek
Pierre Senellart
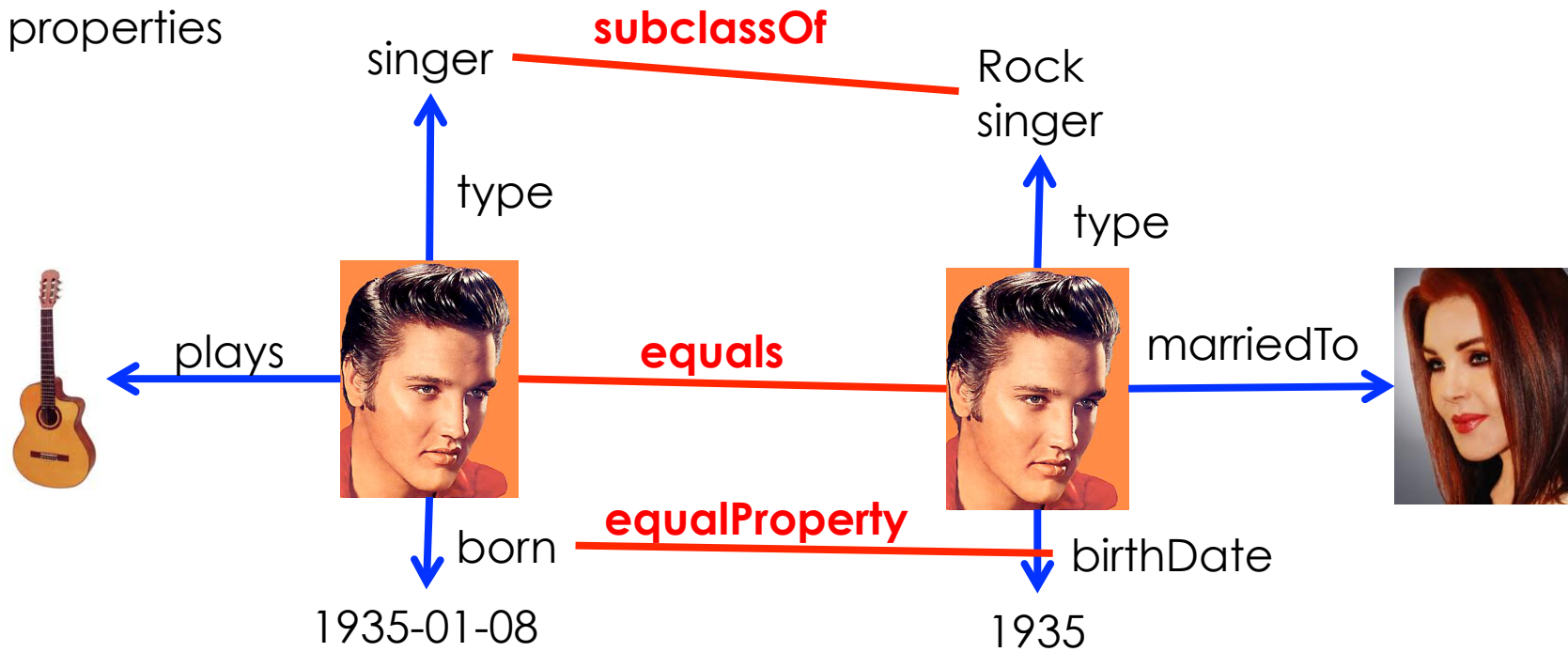## Serge Abiteboul

INRIA

Motivation

YAGO

DBpedia

Goal

Merge two ontologies in order to exploit complementary information.

This means finding equality or subsumption relationships for
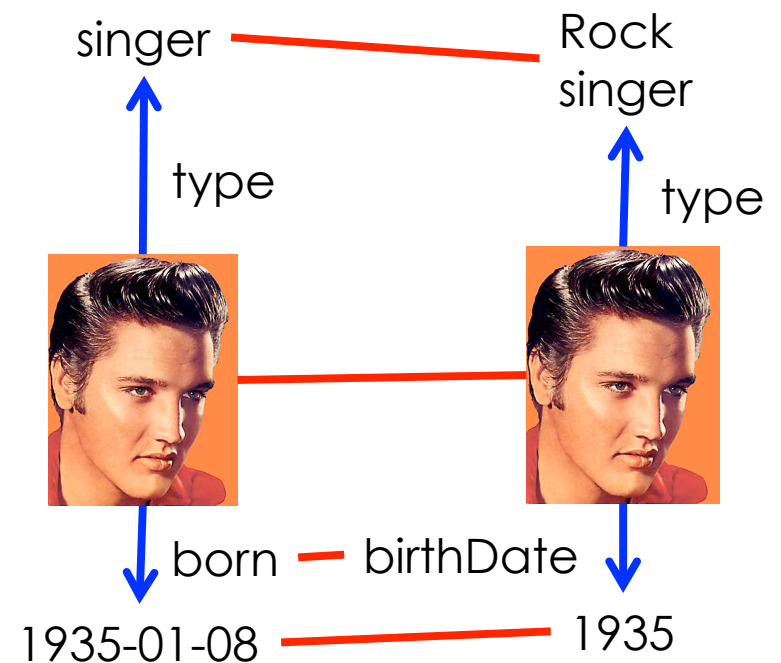- classes
- instances
- properties

Challenges

- Some subsumption relationships may be asymmetric

- Literals may be only similar and not exactly identical

- Logical consistency has to be maintained

- The ontologies in question are not small

Previous work
- has mostly considered either schema or instances but not both
- uses hard logical constraints that may be inadequate
- uses parameters
- has not been made working on large scale

singer — Rock singer

type   type

born — birthDate

1935-01-08 — 1935

Observations

- There is a synergy between equality of classes, relationships and instances
- Inverse functional relationships indicate equality
- Similarity of literals can be computed upfront

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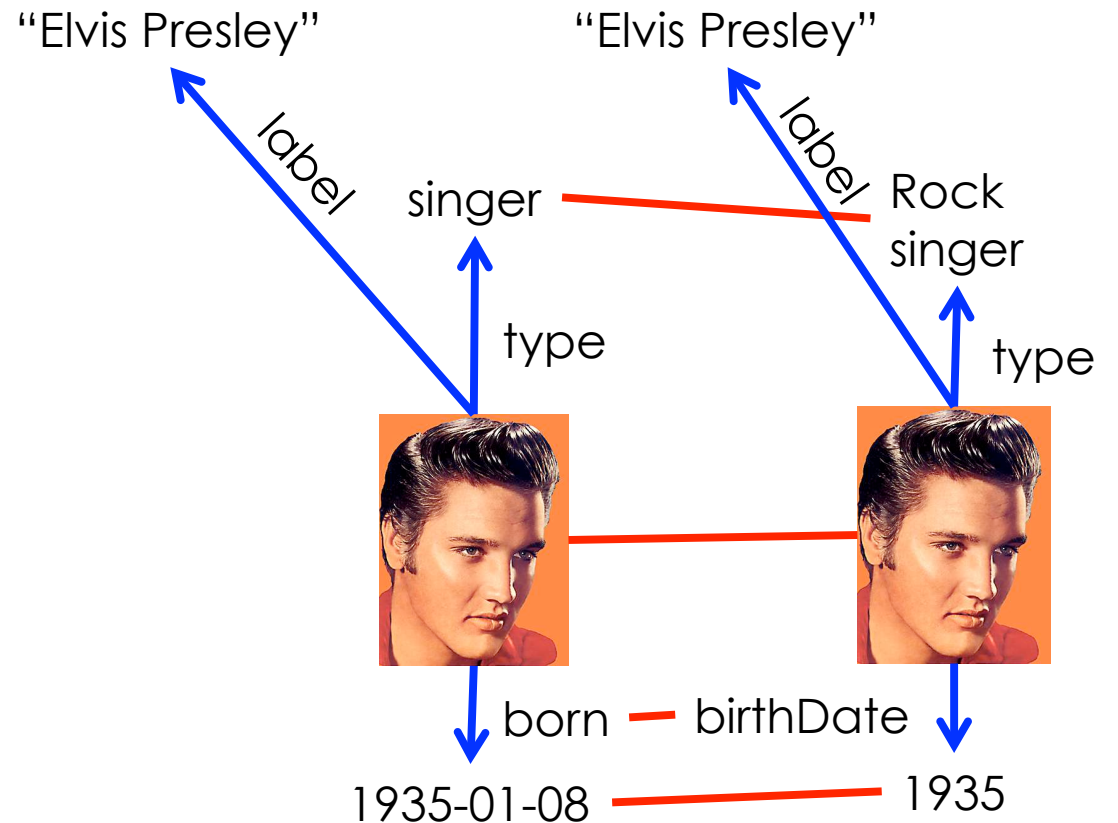
Approach

We aim for a unified model. We considered:

- A Weighted MAX SAT model

- A graph-based propagation model
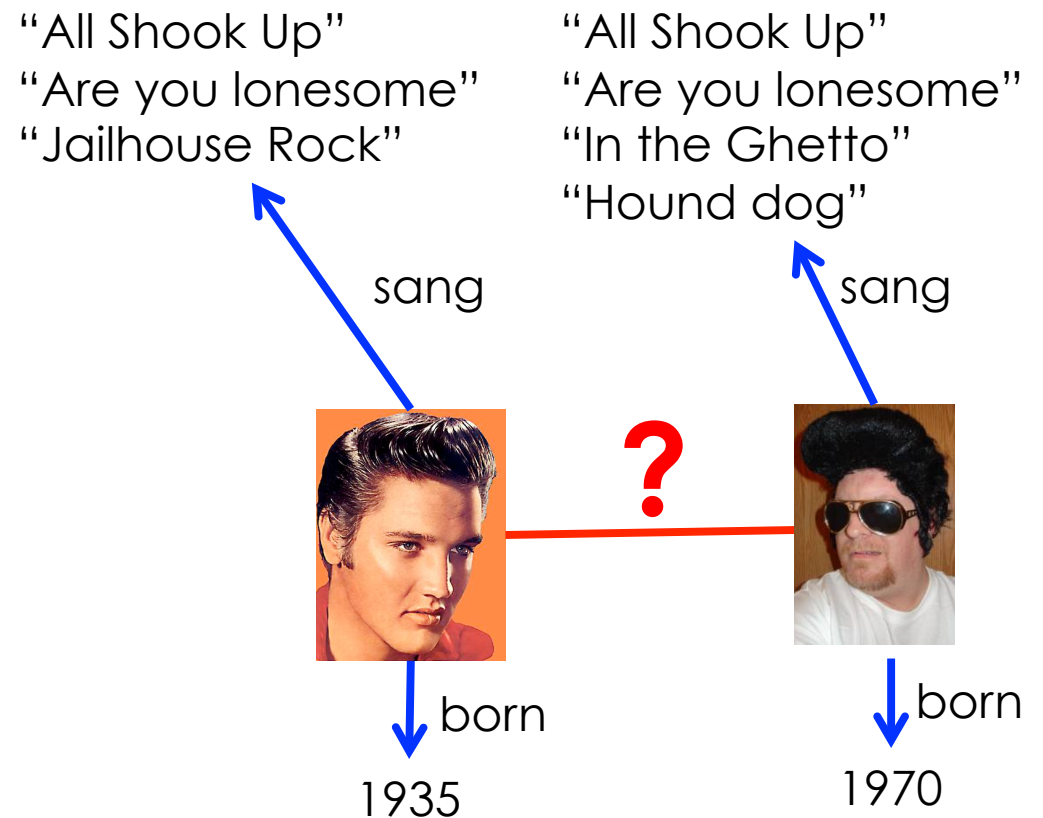
- A rule-based model

- A probabilistic model
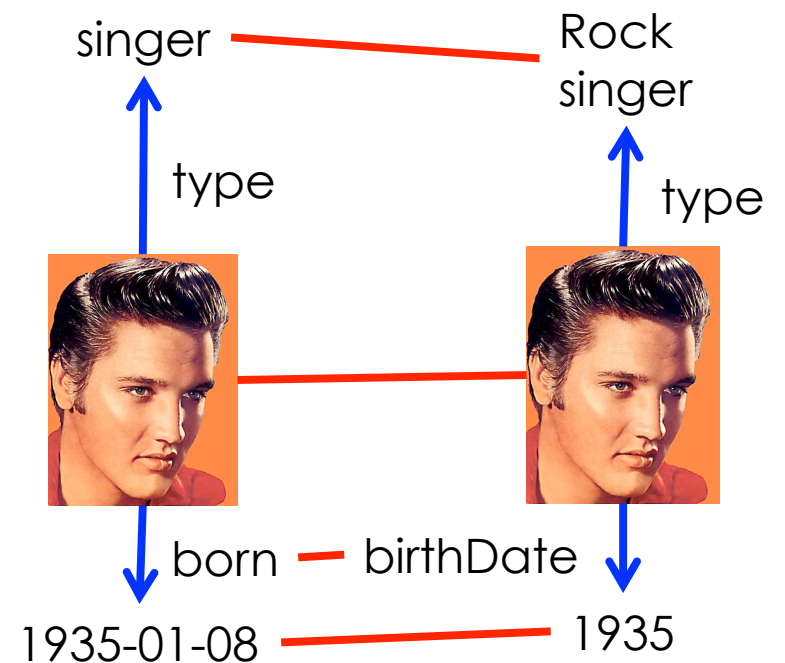
Probabilistic Model

If two entities **share** a value for a relationship,
the entities are likely to be **equal**

"Elvis Presley"   "Elvis Presley"

↑ label   ↑ label

?

↓ born   ↓ born

1935   1935

INRIA
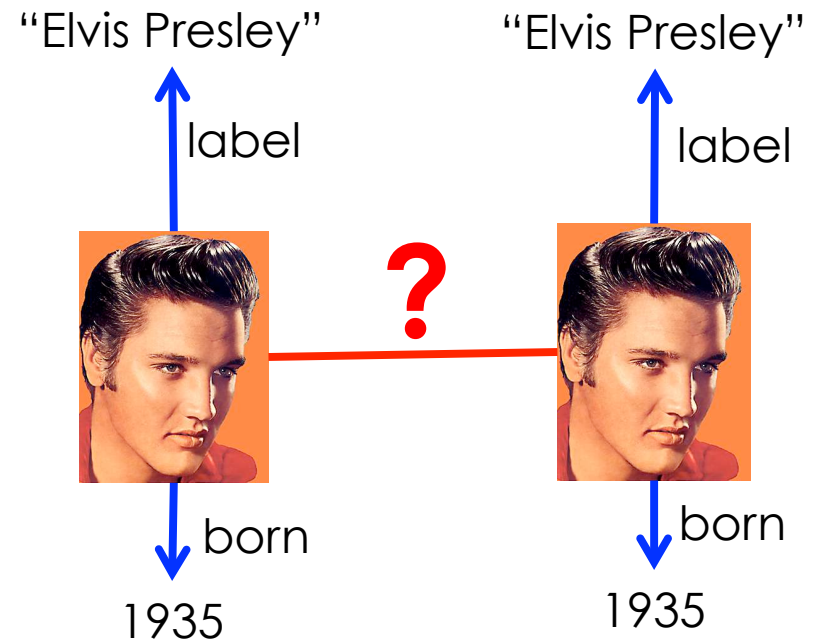
Probabilistic Model

If two entities have a **different** value for a relationship,
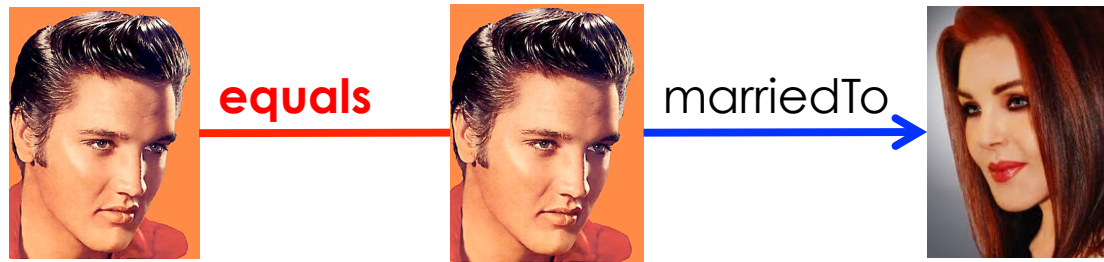the entities are likely to be **unequal**

"All Shook Up"
"Are you lonesome"
"Jailhouse Rock"

"All Shook Up"
"Are you lonesome"
"In the Ghetto"
"Hound dog"

sang

sang

?

born

born

1935

1970

INRIA

Probabilistic Model

If **all instances** of one class are instances of another class,
then the latter class **subsumes** the former

$$\subseteq$$

Rock Singer   Singer

INRIA
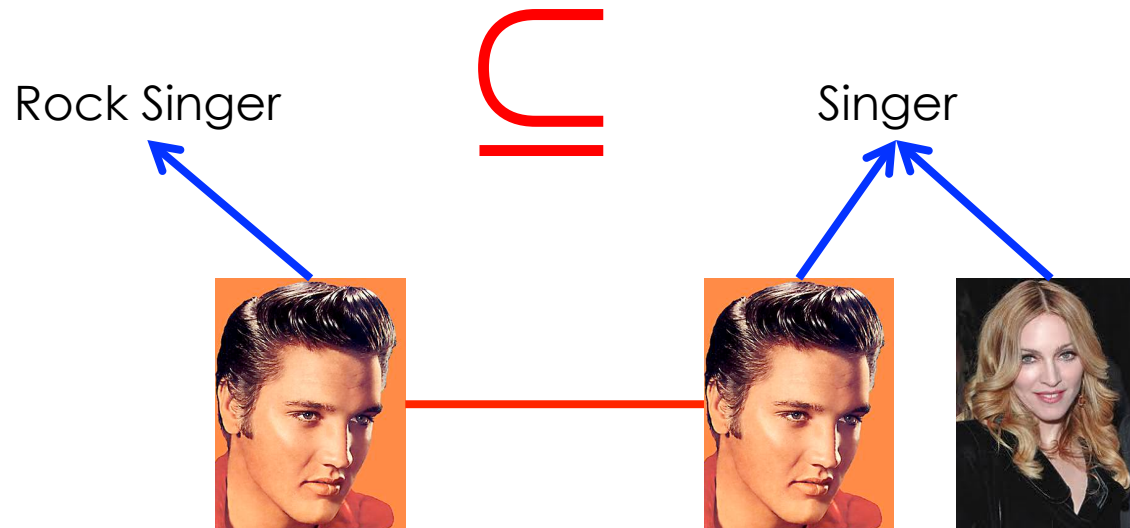
Probabilistic Model

Why this is cool

• it allows the YAGO Elvis to marry the DBpedia Priscilla

Happy End