Contexts and RDF

Jie Bao, Li Ding, and Deborah L. McGuinness
Tetherless World Constellation
Rensselaer Polytechnic Institute
Troy, NY, 12180-3590, USA
{baojie,dingl, dlm}@cs.rpi.edu
Context Matters
- Assumptions

ISWC

Jie Bao
J. Bao

CNN forum

janesmith456
johnsmith123

n/a
Context Matters
- “World”

“Matrix”

“Real World”

South Park

THEY killed Kenny

Fictional People

010001011101010101010101010101010...
Contexts are

• Something related to the meaning of a sentence
  – Provenance (who, when, where, how, etc)
  – Assumptions (e.g., OWA, UNA)
  – World
  – ...

• Claim: when a triple is published/reused/inferred, its context should be made explicit.
Wait

• Don’t we already have
  – Named graph
  – C-OWL
  – N3 quotation
  – Contexts in AI
  – …
Named Graph

Name = context

Graph_RPI
{:LiDing :hasRole :ResearchScientist.}

Contexts are more than names
• One triple may be in multiple contexts
• One context may be reused
• Relations between contexts need to be explicit, too.
C-OWL

- C-OWL provides an ontology mapping language that respects context.
- Knowledge transfer is controlled.
- Contexts are more than mapping
N3Logic

:ThomasJefferson says {Men areCreated Equal.}

• Again, contexts are more than quotation.
Our Proposal

• Based on named graph
• Add two constructs
  • rdf:context
  • rdf:import
Adding Contexts to RDF

Part I: rdf:context

G rdf:context C.

C may give a context definition document

C agent LiDing.

C semantics OWL_Full

Part II: rdf:import

G1 rdf:import G2.

G1 rdf:context C1.

G2 rdf:context C2.

• Importing as citation
• How knowledge transferred from G2 to G1 can be controlled by relations between C1 and C2.
Partial Reuse

{s1 p1 o1.} rdf:context C1.
{s2 p2 o2.} rdf:context C2.

{\text{s3 p3 o3.}} rdf:context C3.

C3

C3 rdfc:compatibleWith C1.
C3 rdfc:incompatibleWith C2.
Reasoning with Contexts

Context relations
• Compatible
• Incompatible
• Extend
• In

Context rules
• C is compatible with contexts with agent “rpi:LiDing”
• C is compatible with contexts that are compatible with C2

Can be in OWL, RIF or other languages
Open Issues

• Context specification
  – Provenance model?
  – Context relation vocabulary?

• Formal semantics

• Default contexts