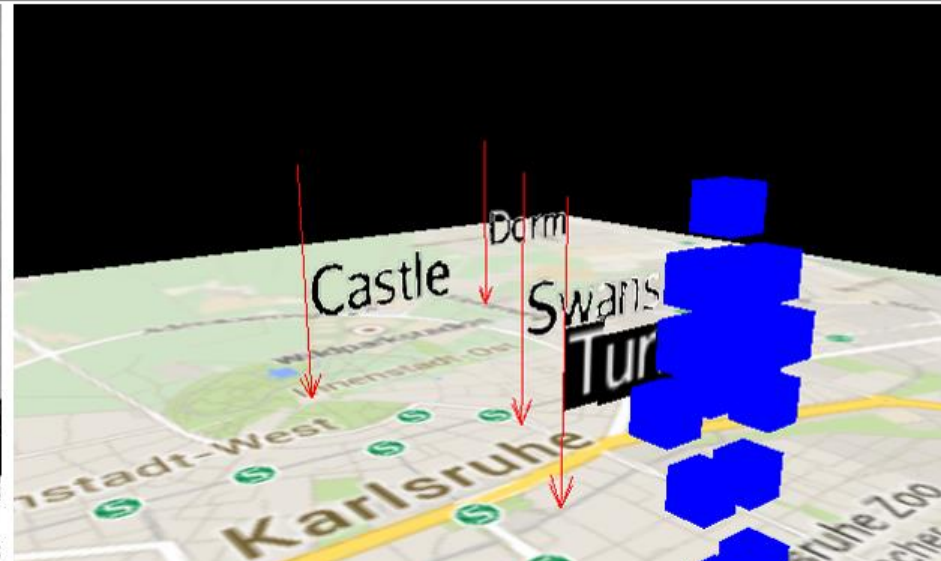
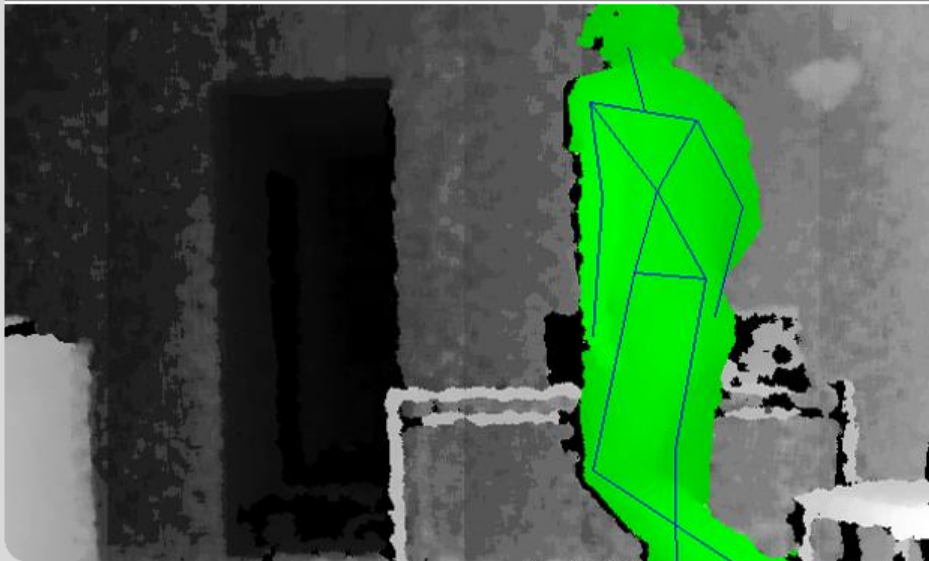


# Stream Reasoning in Mixed Reality Applications

Andreas Harth

Joint work with Felix Keppmann, Steffen Stadtmueller and Tobias Kaefer  
Stream Reasoning Workshop, Vienna, November 2015

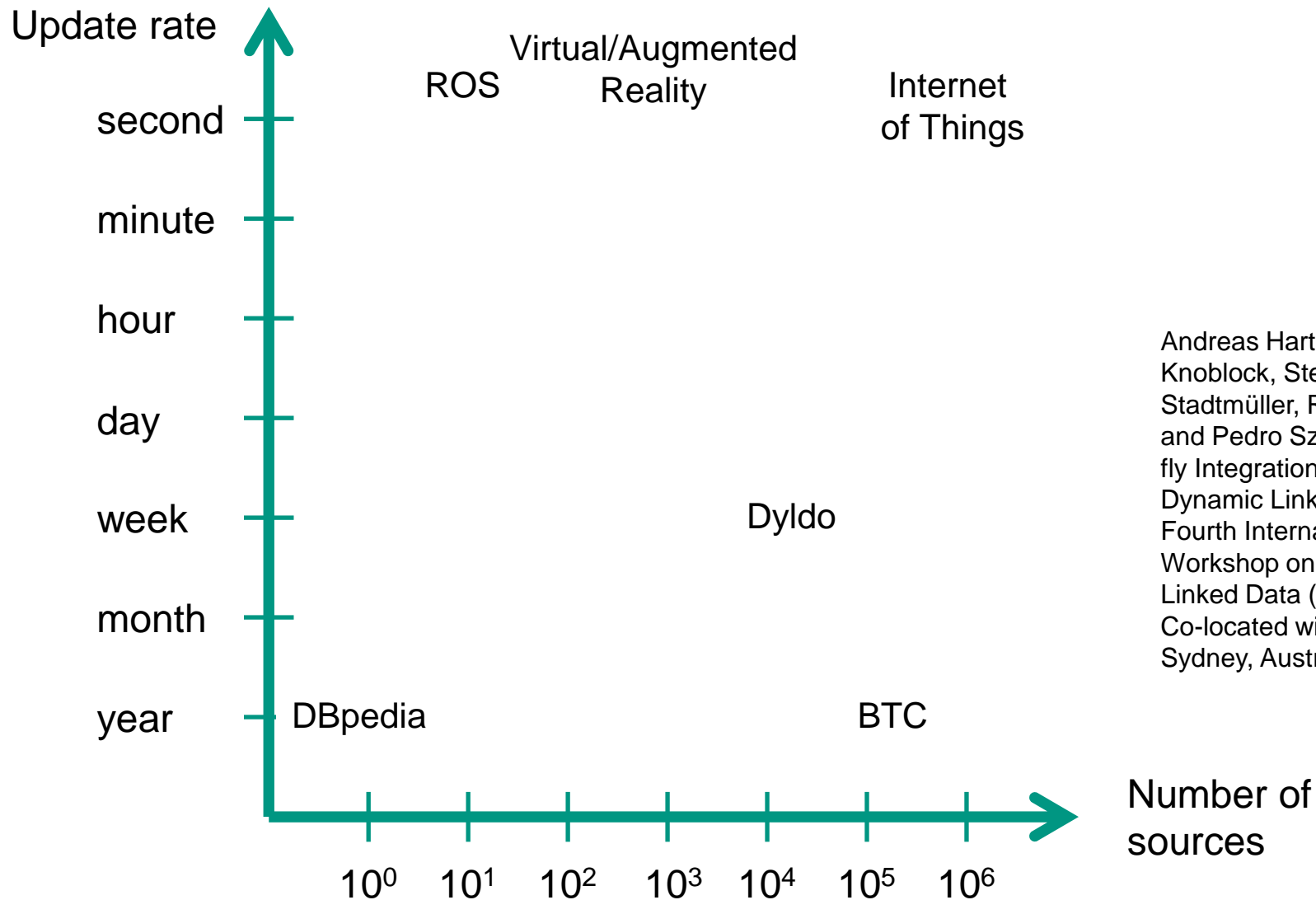
INSTITUTE AIFB



# Outline

- Motivation
- Representation and Interface
- Architecture
- Applications
- Conclusion

# Motivation: Data Integration and System Interoperation at Scale

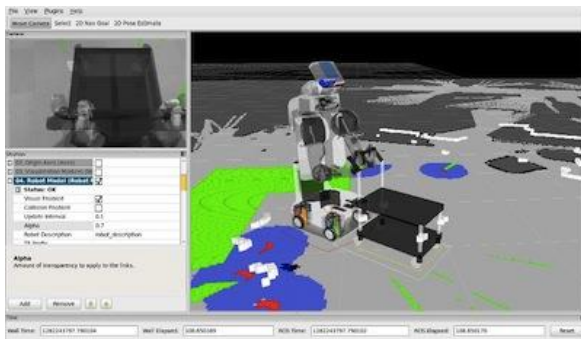


Andreas Harth, Craig Knoblock, Steffen Stadtmüller, Rudi Studer and Pedro Szekely. "On-the-fly Integration of Static and Dynamic Linked Data". Fourth International Workshop on Consuming Linked Data (COLLD 2013). Co-located with ISWC 2013, Sydney, Australia.

# Representation and Interface

1. Use URIs as names for things
2. Use HTTP URIs so that people can look up those names.
3. When someone looks up a URI, provide useful information, using the standards (RDF\*, SPARQL)
4. Include links to other URIs. so that they can discover more things.

<http://www.w3.org/DesignIssues/LinkedData.html>



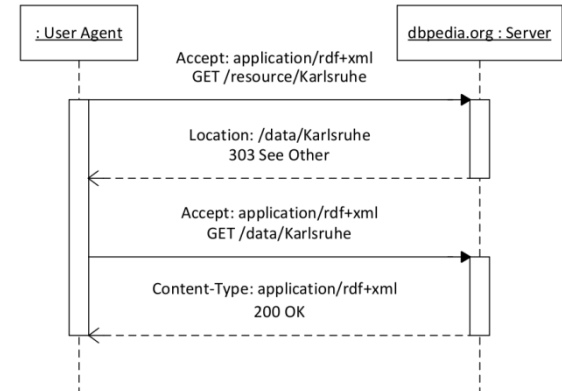
[https://en.wikipedia.org/wiki/Robot\\_Operating\\_System](https://en.wikipedia.org/wiki/Robot_Operating_System)



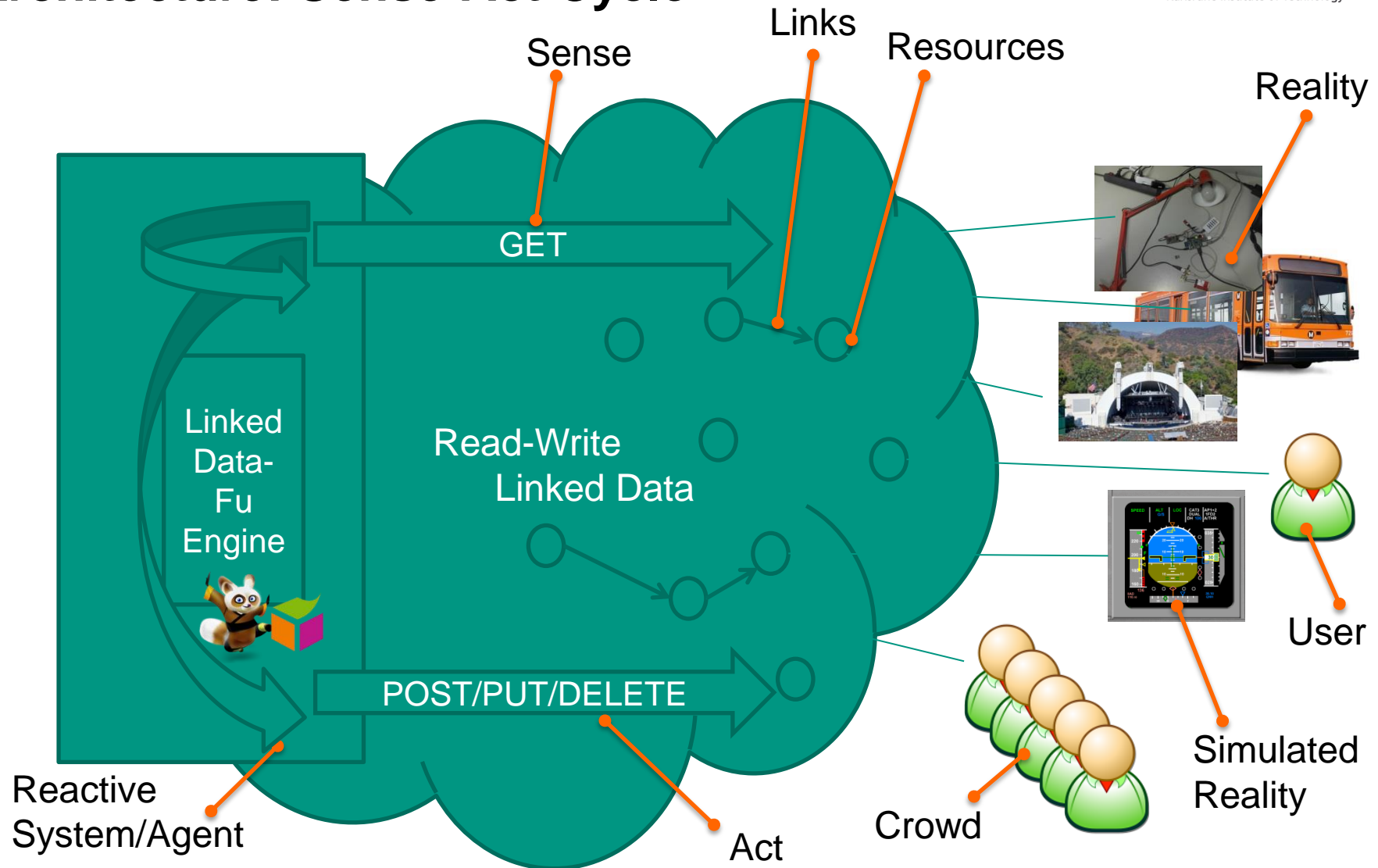
GET <http://example.com/>



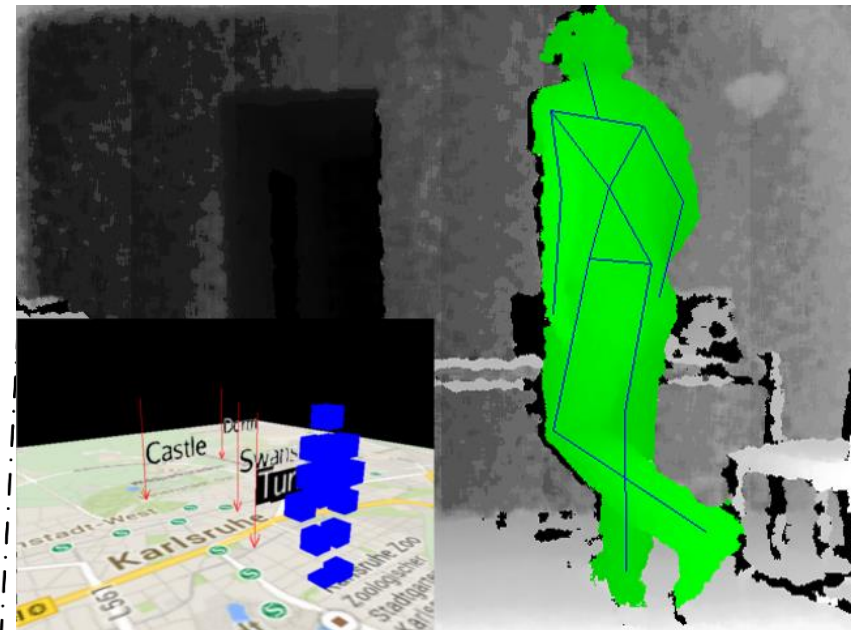
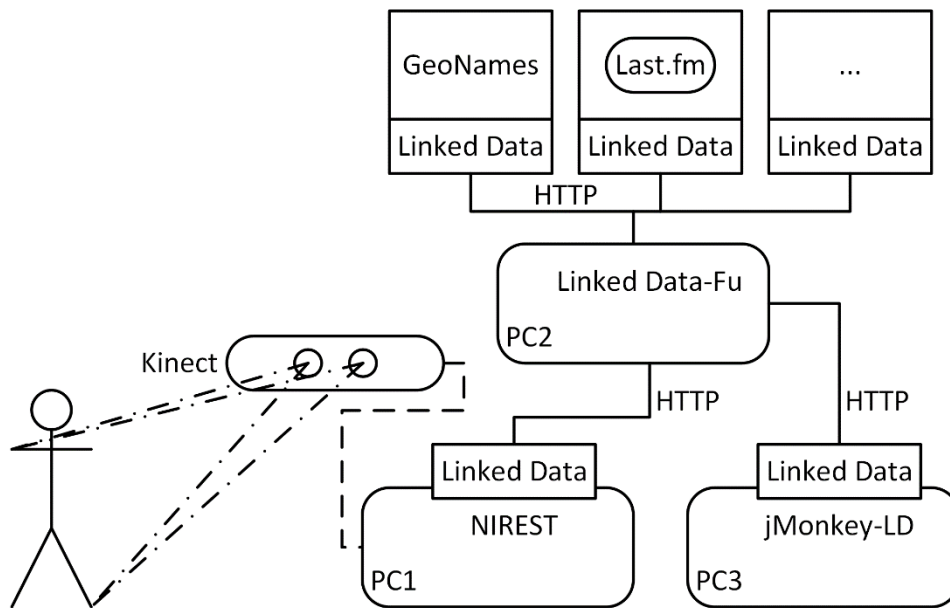
200 OK



# Architecture: Sense-Act Cycle



# Integrating Highly Dynamic RESTful Linked Data APIs in a Virtual Reality Environment



Felix Leif Keppmann, Tobias Käfer, Steffen Stadtmüller, René Schubotz and Andreas Harth. "Integrating Highly Dynamic RESTful Linked Data APIs in a Virtual Reality Environment". International Symposium on Mixed and Augmented Reality (Posters & Demos). ISMAR 2014, Munich, Germany.

Felix Leif Keppmann, Tobias Käfer, Steffen Stadtmüller, René Schubotz and Andreas Harth. "High Performance Linked Data Processing for Virtual Reality Environments". International Semantic Web Conference (Posters & Demos). ISWC 2014, Riva del Garda, Italy.

# Conclusion

- Read-Write Linked Data provides a simple and elegant interface to diverse data sources and data sinks with varying update rates
- We are able to scale rule-based system to large number of sources (via hyperlinks – several GBs of data from the LOD cloud) and high update rates (suitable for interactive VR/AR applications)
- We can address industrial use cases with a simple cognitive architecture accessing the environment
- Future work concerns the representation, observation and execution of procedural knowledge