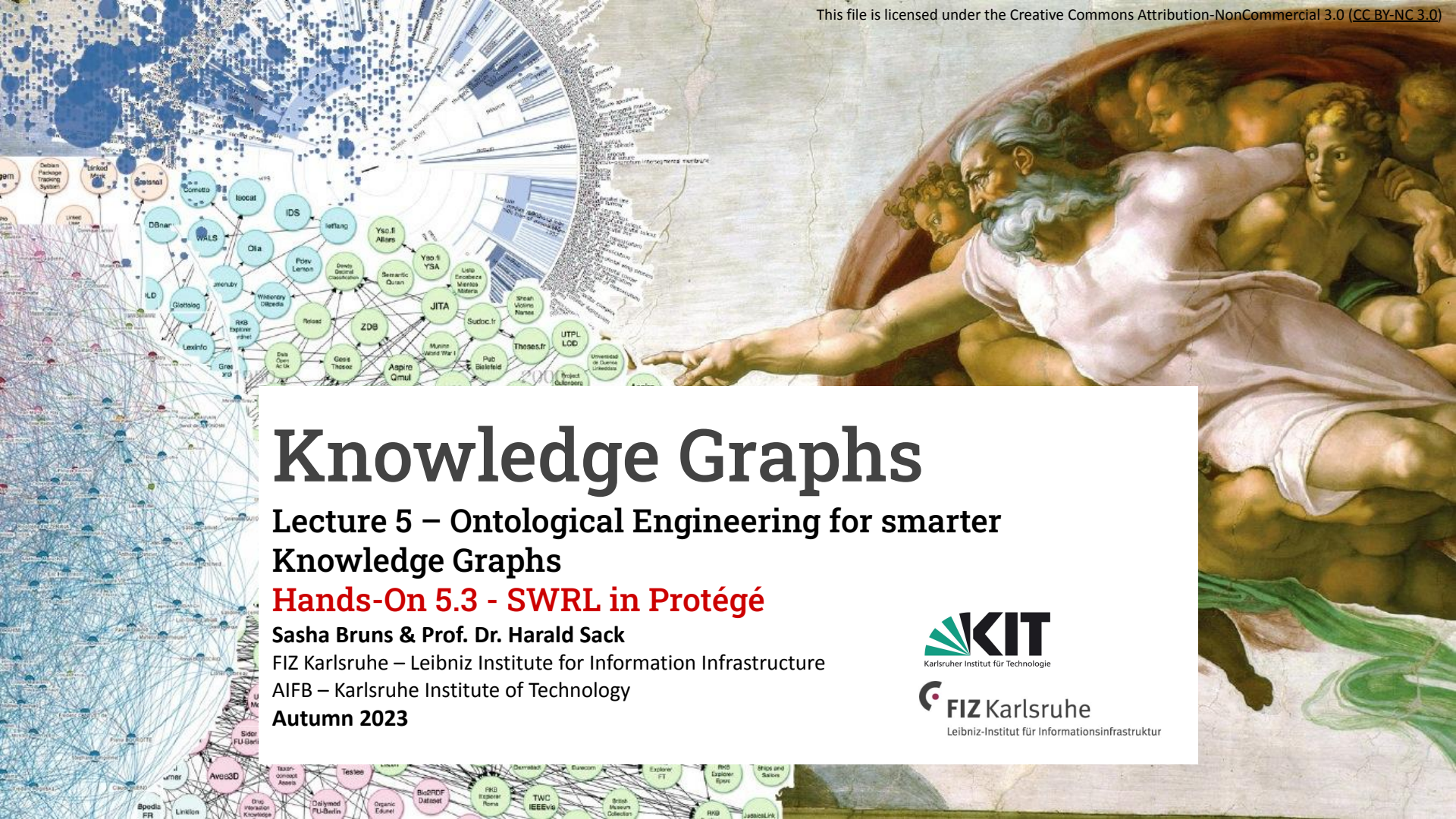

Knowledge Graphs

Lecture 5 – Ontological Engineering for smarter Knowledge Graphs

Hands-On 5.3 - SWRL in Protégé

Sasha Bruns & Prof. Dr. Harald Sack
FIZ Karlsruhe – Leibniz Institute for Information Infrastructure
AIFB – Karlsruhe Institute of Technology
Autumn 2023

Karlsruher Institut für Technologie

FIZ Karlsruhe
Leibniz-Institut für Informationsinfrastruktur

Karlsruher Institut für Technologie

FIZ Karlsruhe
Leibniz Institute for Information Infrastructure

What SWRL?

- Semantic Web Rule Language (SWRL) is an extension of the Web Ontology Language (OWL)
- Allows for creating of rules to infer new knowledge
- SWRL rules are expressed in the form of logical axioms
- The antecedent and consequent of a SWRL rule are expressed using first-order logic and built-in predicates, which provide a wide range of expressive power.

Karlsruher Institut für Technologie

FIZ Karlsruhe
Leibniz Institute for Information Infrastructure

Let's try it together!

Karlsruher Institut für Technologie

FIZ Karlsruhe
Leibniz Institute for Information Infrastructure

Reclassification:

```
VegetarianIngredient(?x) ->
Ingredient(?x)
```

Karlsruher Institut für Technologie
FIZ Karlsruhe
Leibniz Institute for Information Infrastructure

Property Value Assignment:

```
Pizza(?x) ^ ingredient(?x,?y) ^
        Vegetable(?y) ->
    vegetarianIngredient(?x,?y)
```

Karlsruher Institut für Technologie
FIZ Karlsruhe
Leibniz Institute for Information Infrastructure

Complex Class Definitions:

```
Restaurant(?x) ^ servesPizza(?x, ?y) ^
   ingredient(?y, ?z) ^ Meat(?z) ->
      NonVegeterianRestaurant(?x)
```

Built-ins with Literals:

```
Pizza(?x) ^ priceinEuro(?x, ?euro) ^
swrlb:multiply(?dollars, ?euro, 1.06)
   ->priceinDollars(?x, ?dollars)
```

Karlsruher Institut für Technologie
FIZ Karlsruhe
Leibniz Institute for Information Infrastructure

Built-ins with Literals:

```
Pizza(?d) ^ priceinEuro(?d, ?p) ^
    numberOfPieces(?d, ?n) ^
   swrlb:divide(?r, ?p, ?n) ->
      pricePerPiece(?d, ?r)
```

Thank you very much for your Attention!

Knowledge Graphs - Lecture 5 – Ontological Engineering for smarter Knowledge Graphs

Hands-On 5.3

Sasha Bruns & Prof. Dr. Harald Sack
FIZ Karlsruhe – Leibniz Institute for Information Infrastructure & AIFB – Karlsruhe Institute of Technology
Autumn 2023

Karlsruher Institut für Technologie
FIZ Karlsruhe
Leibniz-Institut für Informationsinfrastruktur