

Knowledge Representation for the Semantic Web

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Slides 10 – 03/02/2010

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Slides are based on

**Pascal Hitzler, Markus Krötzsch,
Sebastian Rudolph**

**Foundations of Semantic Web
Technologies**

Chapman & Hall/CRC, 2010

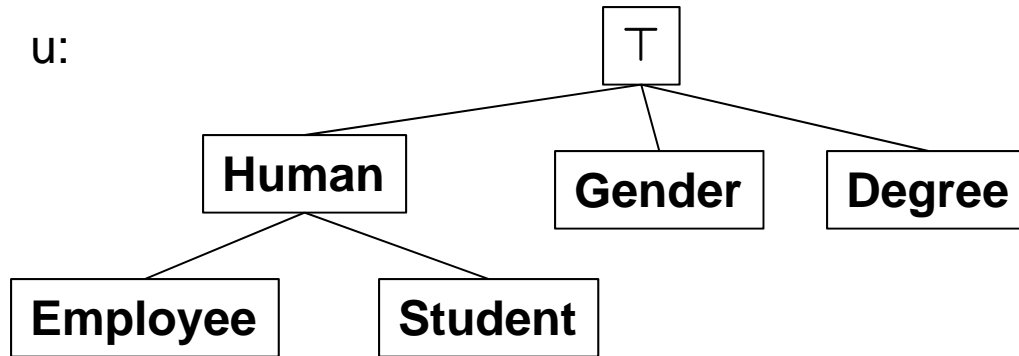
Flyer with special offer is available.

<http://www.semantic-web-book.org>

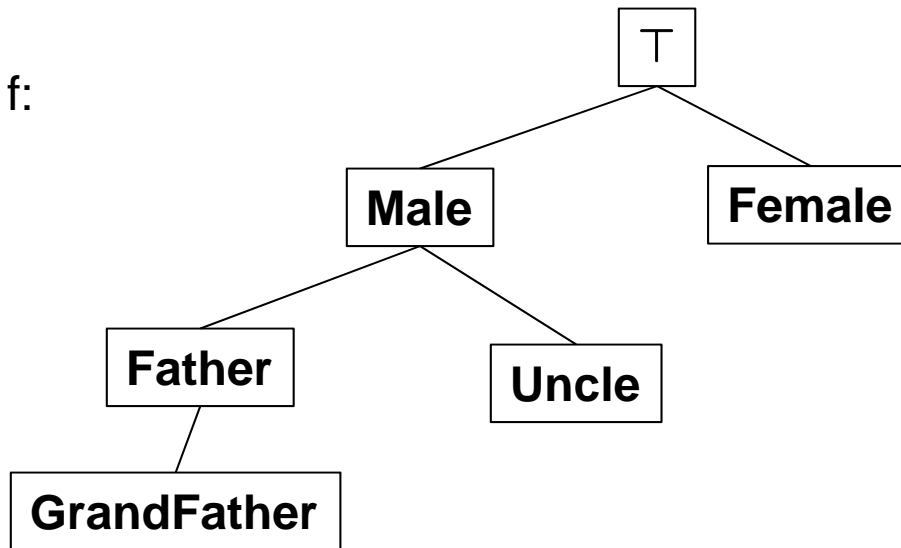


- **Two ontologies on the web – and imagine an application which would need to use both.**
- **Task: Ontology integration. I.e., make one ontology out of two.**
- **There's lots of work (and research) on how to do this (including some kind of loose coupling between the ontologies). We take a conservative approach: Really make *one* ontology.**
- **How to start? How to do it?**
 - **Start with the subclass hierarchy of the named classes.**
Then go from there.

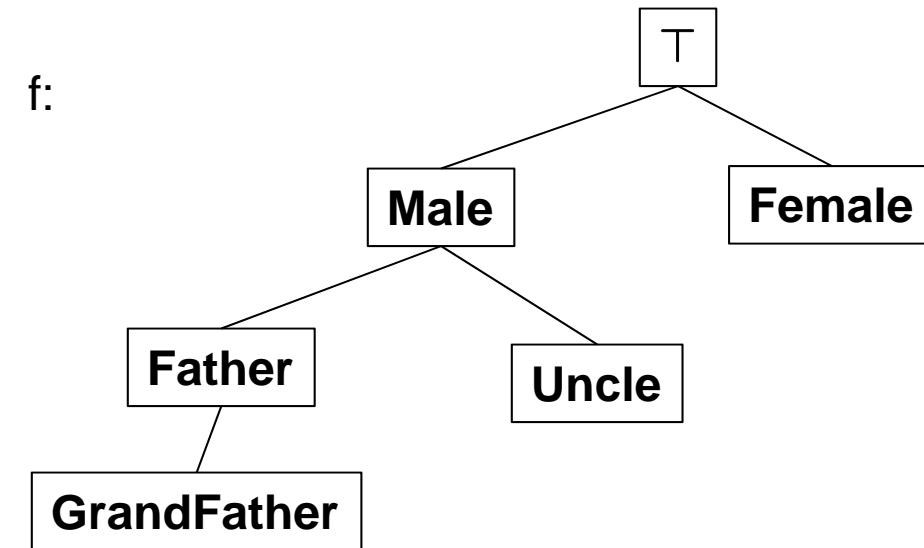
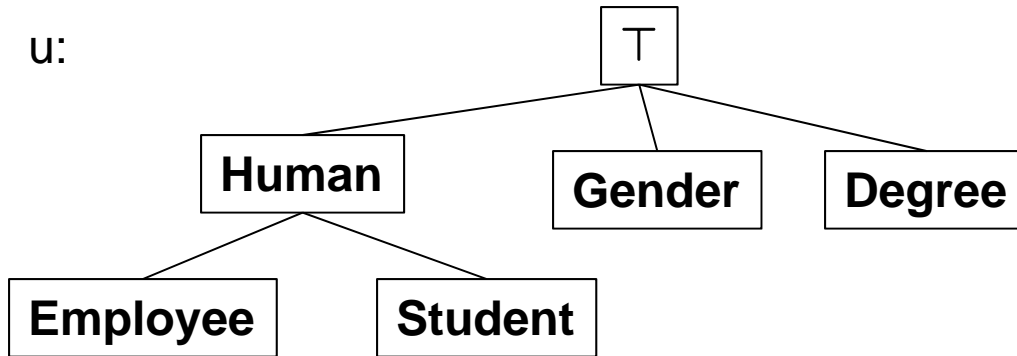
u:



f:



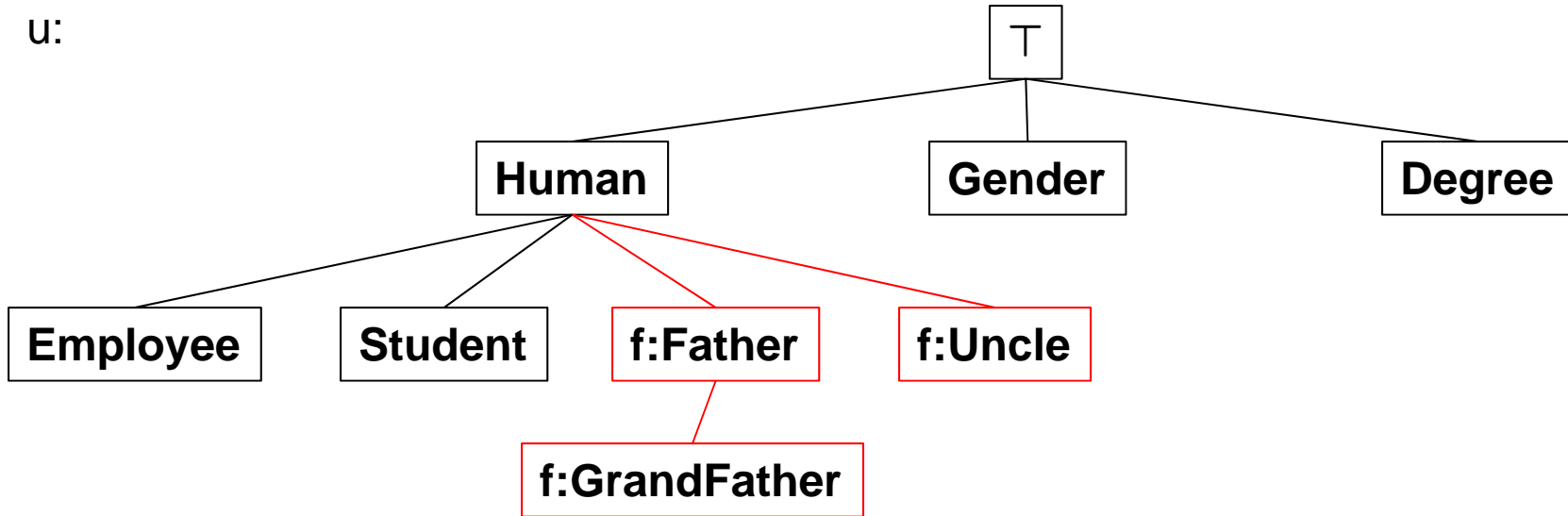
Integration – simple cases



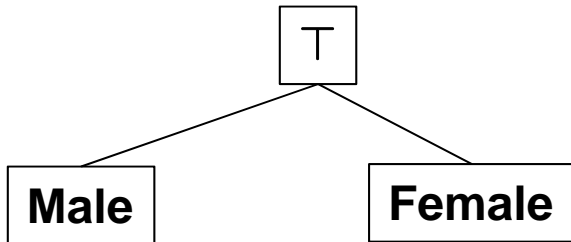
f:Father \sqsubseteq u:Human
f:Uncle \sqsubseteq u:Human
f:GrandFather \sqsubseteq u:Human

Integration – simple cases

u:

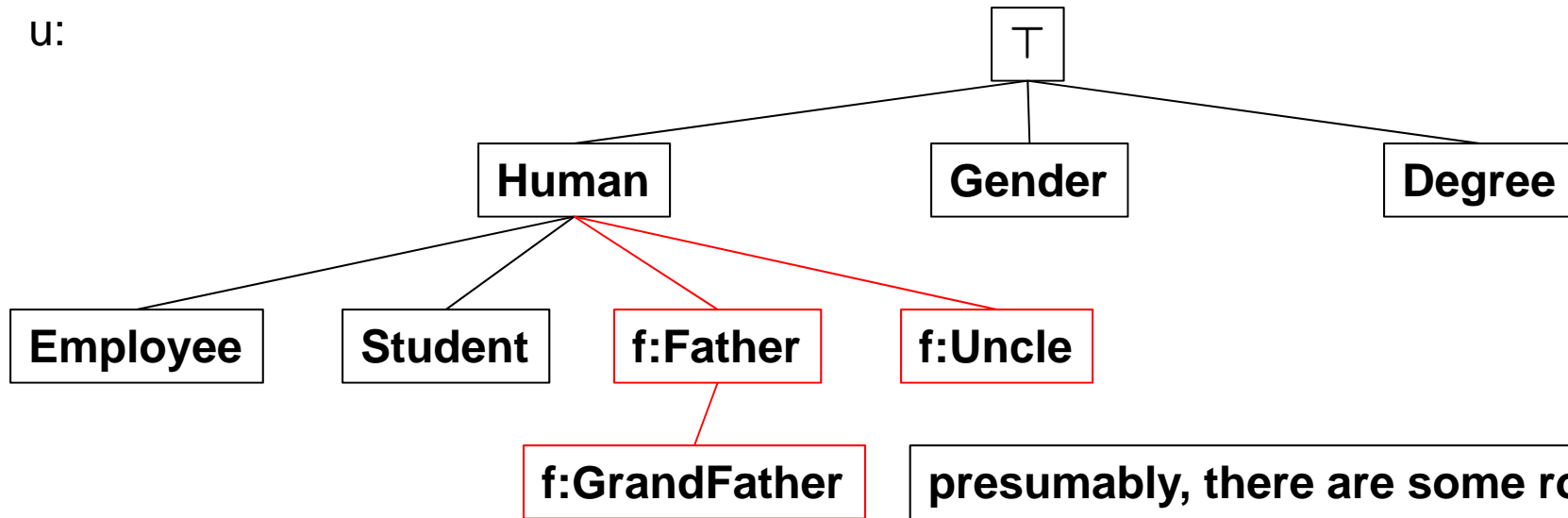


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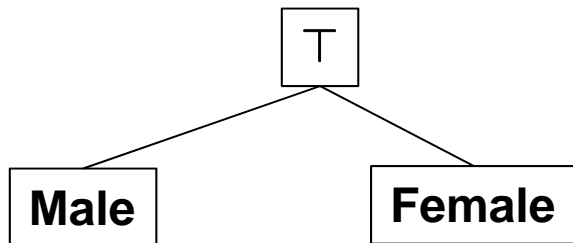


what to do with the genders?

u:



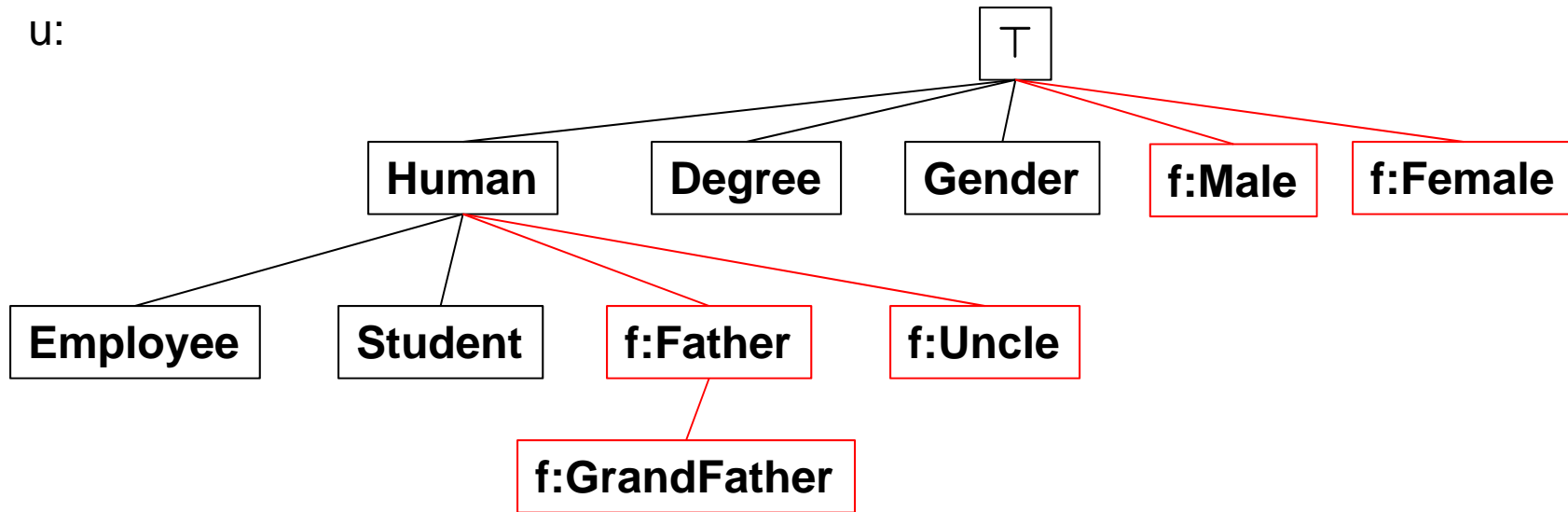
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presumably, there are some roles, e.g.
 $u:\text{hasGender}$
and some individuals, e.g.
 $\{u:\text{male}, u:\text{female}\} \sqsubseteq u:\text{Gender}$

add, e.g.,
 $f:\text{Male} \equiv \exists u:\text{hasGender}.\{u:\text{male}\}$
 $f:\text{Female} \equiv \exists u:\text{hasGender}.\{u:\text{female}\}$

u:



$f:Male \equiv \exists u:hasGender.\{u:male\}$
 $f:Female \equiv \exists u:hasGender.\{u:female\}$

Alternatively: do some more fundamental remodeling

- **Compare your taxonomies. Are there overlaps? Make one taxonomy out of them.**
- **In case of difficulties, have a closer look at the ontologies and find either a way to “map” between them or remodel to make things fit both worlds.**
- **Once the taxonomies are integrated, check all roles, in particular domain and range statements, and adjust/adapt where needed.**
- **Finally check the individuals/ABoxes. Most of that should be sorted already.**

Make notes on paper such that you can easily reproduce the integrated ontology from your notes at home.