

Bilingual Researcher Profiles

Modeling Dutch Researchers in both English and Dutch Using the VIVO Ontology

Tamy Chambers¹, Sahil Shah¹, Ashish Urankar¹, Venkat Kalyan¹, Andrea Scharnhorst², Linda Reijnhoudt², Laura Rideour¹, Christophe Guéret², Ying Ding¹

GOAL:

To use the VIVO ontology to accurately represent Dutch researchers and their organizations, while remaining true to the native language and structure of the Dutch university.

ACTIONS:

1. Extension Ontology

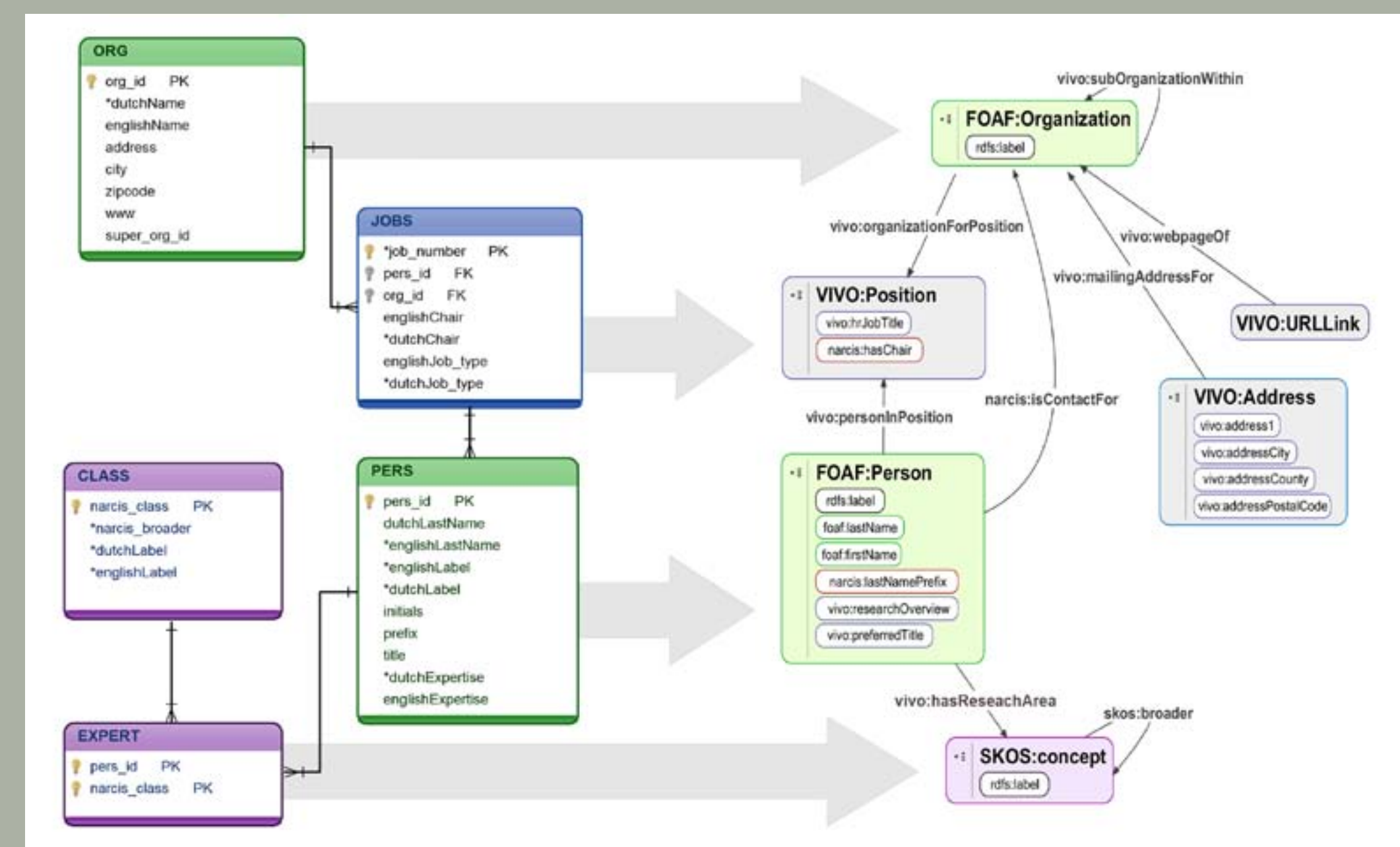
created to account for differences in the Dutch naming structure and differences in university position description and alignment.

2. Language Attribute Tags

to recorded data in both English and Dutch to achieve better access by both the native Dutch population and the larger English based research community.

3. SKOS Ontology

to take advantage of an existing research classification structure used to describe researcher expertise uniformly across the Dutch system.



Mapping Researcher Data to the existing VIVO ontology.

Traditionally, database tables relate to ontology classes and table columns relate to properties. However, in practice additions to both the ontology and the data were required to achieve the most accurate representation. The “narcis” prefix before ontology properties denote those created in the extension ontology to accommodate unique Dutch researcher data.

Extension Ontology

```
<Declaration>
<Class IRI="#ResearcherPosition"/>
</Declaration>
<SubClassOf>
<Class IRI="#ResearcherPosition"/>
<Class abbreviatedIRI="vivo:Position"/>
</SubClassOf>
<Declaration>
<ObjectProperty IRI="#hasContactPerson"/>
</Declaration>
<Declaration>
<ObjectProperty IRI="#isContactFor"/>
</Declaration>
<InverseObjectProperties>
<ObjectProperty IRI="#isContactFor"/>
<ObjectProperty IRI="#hasContactPerson"/>
</InverseObjectProperties>
<ObjectPropertyDomain>
<ObjectProperty IRI="#hasContactPerson"/>
<Class abbreviatedIRI="foaf:Organization"/>
</ObjectPropertyDomain>
<ObjectPropertyRange>
<ObjectProperty IRI="#hasContactPerson"/>
<Class abbreviatedIRI="foaf:Person"/>
</ObjectPropertyRange>
<ObjectPropertyDomain>
<ObjectProperty IRI="#isContactFor"/>
<Class abbreviatedIRI="foaf:Person"/>
</ObjectPropertyDomain>
<ObjectPropertyRange>
<ObjectProperty IRI="#isContactFor"/>
<Class abbreviatedIRI="foaf:Person"/>
</ObjectPropertyRange>
<Declaration>
<DataProperty IRI="#hasChair"/>
</Declaration>
<DataPropertyDomain>
<DataProperty IRI="#hasChair"/>
<Class abbreviatedIRI="vivo:Position"/>
</DataPropertyDomain>
<Declaration>
<DataProperty IRI="#lastNamePrefix"/>
</Declaration>
<DataPropertyDomain>
<DataProperty IRI="#lastNamePrefix"/>
<Class abbreviatedIRI="foaf:Person"/>
</DataPropertyDomain>
```

Language Attribute Tags

The *rdfs:label* property was used to semantically identify each entity. The VIVO application displays this label as the title of profile page. To provide both English and Dutch formatted name displays we used attribute tags, delineated by the @ sign, to identify the correct language code.

This is particularly important given that the Dutch display the last name and prefix differently than in English.

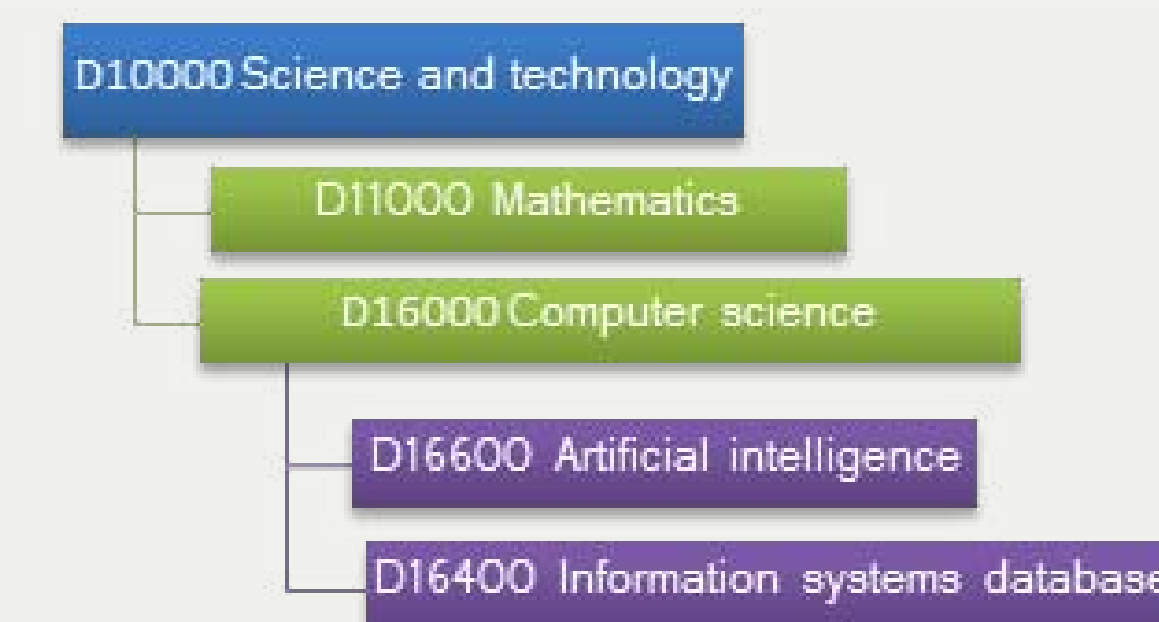
Professor van Harmelen's *rdfs:label* would, therefore, be as follows written in Turtle syntax.

```
<http://www.narcis.nl/RecordID/
PERS1232925>
rdfs:label
"van Harmelen, F.A.H." @en;
"Harmelen, F.A.H., van" @nl.
```

Other classes were similarly coded with language tags attached to the *rdfs:label*. Language attribute tags were also added to text defined by the properties *vivo:hrJobTitle*, *narcis:hasChair*, and *vivo:researchOverview*.

SKOS Ontology

Existing Dutch research classification



To take advantage of an existing classification system, we employed the SKOS ontology to represent the schema. The URIs were based on the classification code numbers and referenced with the *skos:notation* property. The *skos:Concept* class was applied to all terms using the *rdf:type* property. The *skos:prefLabel* property allowed for English and Dutch translations of the descriptive name and SKOS properties *skos:broader* and *skos:narrower* were used to connect the terms according to the given hierarchy. The following example is a sample term modeled in RDF using the Turtle syntax.

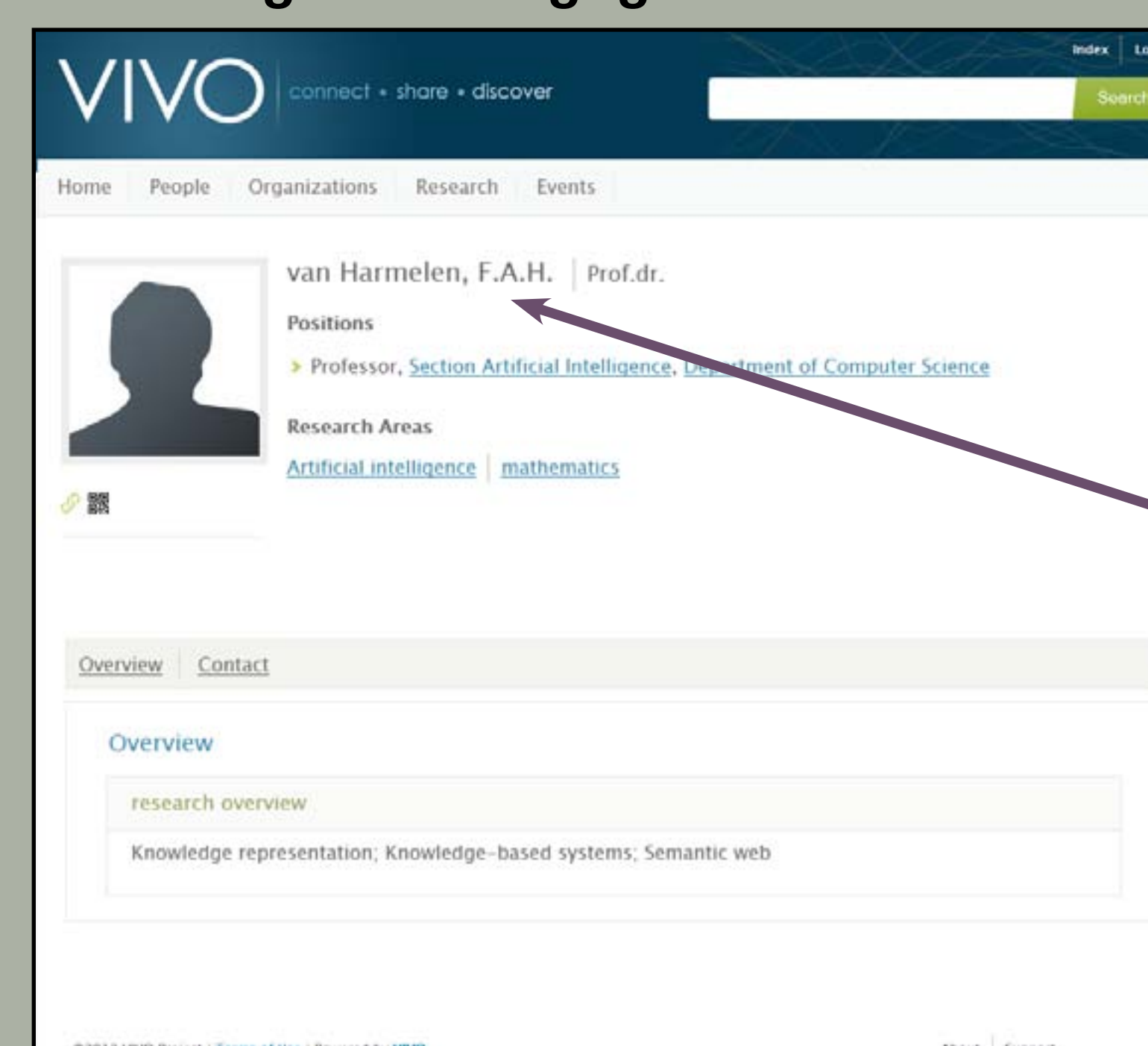
```
<http://www.narcis.nl/Class-D16600>
a skos:Concept ;
skos:notation "D16600" ;
skos:prefLabel
"Kunstmatige intelligentie"@nl ,
"Artificial Intelligence"@en ;
skos:broader <http://www.narcis.nl/
Class-D16000> .
```

In this example, D16600 represents the artificial intelligence field, while D16000 represent the larger computer science field.

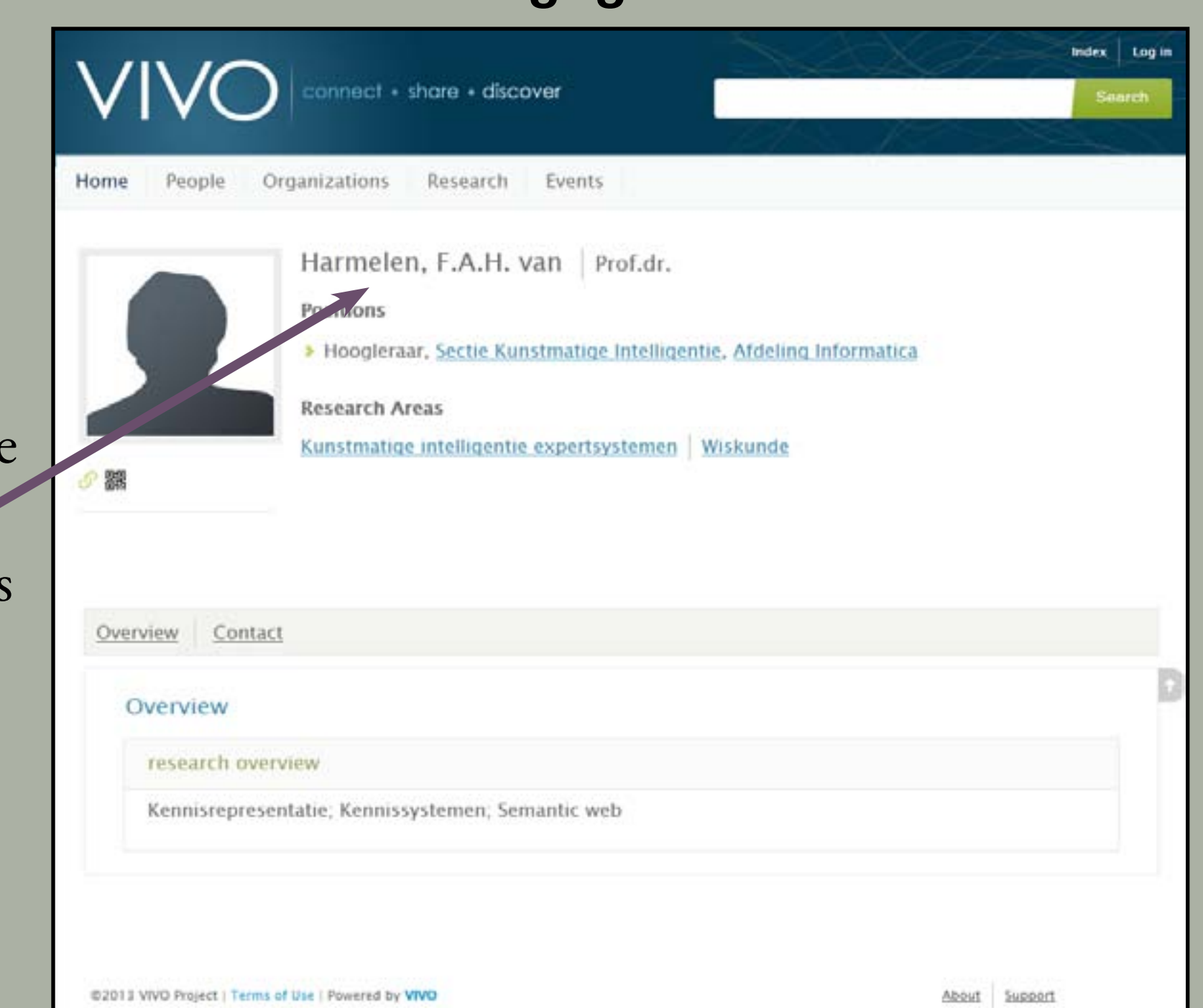
Example VIVO profile pages

After the RDF triples and extension ontology were loaded into the VIVO application a complete set of webpage profiles were automatically generated for each researcher. These pages are linked through the department hierarchy and the researcher classification. An example of Professor van Harmelen's profile is provided below in both English and Dutch.

English Language VIVO Profile



Dutch Language VIVO Profile



Note: Name display difference includes indexing features

Conclusions

- While a key advantage of the VIVO ontology is the use of extension ontologies at the local level to model unique institutional entities, we would recommend the VIVO ontology team include a researcher class a subclass of *vivo:position* to provide more accurate representation of researchers in European institutions, non-academic, and corporate research institutes.
- Our test proves that language attribute tags can be used within the VIVO ontology to represent researcher information in more than one language thereby providing greater data access and representation.
- Our example shows that a research expertise classifications can be used successfully in a researcher profile system to provide useful linking between researchers by research area. Future work could investigate the use of other open source classification systems available to identify research area in a consistent and hierarchical structure.

References

- Krafft, D. B., Cappadona, N. A., Devare, B. M., Lowe, B. J., & Corson-Rikert, J. (2010). VIVO: Enabling National Networking of Scientists. *Proceedings of WebSci10: Extending the society of on-line, Raleigh, NC, April 26-27*.
- Corson-Rikert, J., Mitchell, S., Lowe, B., Rejack, N., Ding, Y., & Guo, C. (2012). The VIVO ontology. In K. Börner, M. Conlon, J. Corson-Rikert, & Y. Ding (Eds.), *VIVO: A Semantic Approach to Scholarly Networking and Discovery* (pp. 15–33). Morgan & Claypool.



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Indiana University - Bloomington,
²School of Informatics & Computing,
¹Department of Information & Library Science
1320 E. 10th Street, LI 011,
Bloomington, Indiana 47405-3907



³Data Archiving and Networking Services
Postbus 93067
2509 AB Den Haag
Anna van Saksenlann 10
2593 HT Den Haag

Direct questions and comments to:
Tamy Chambers
tisch@indiana.edu

