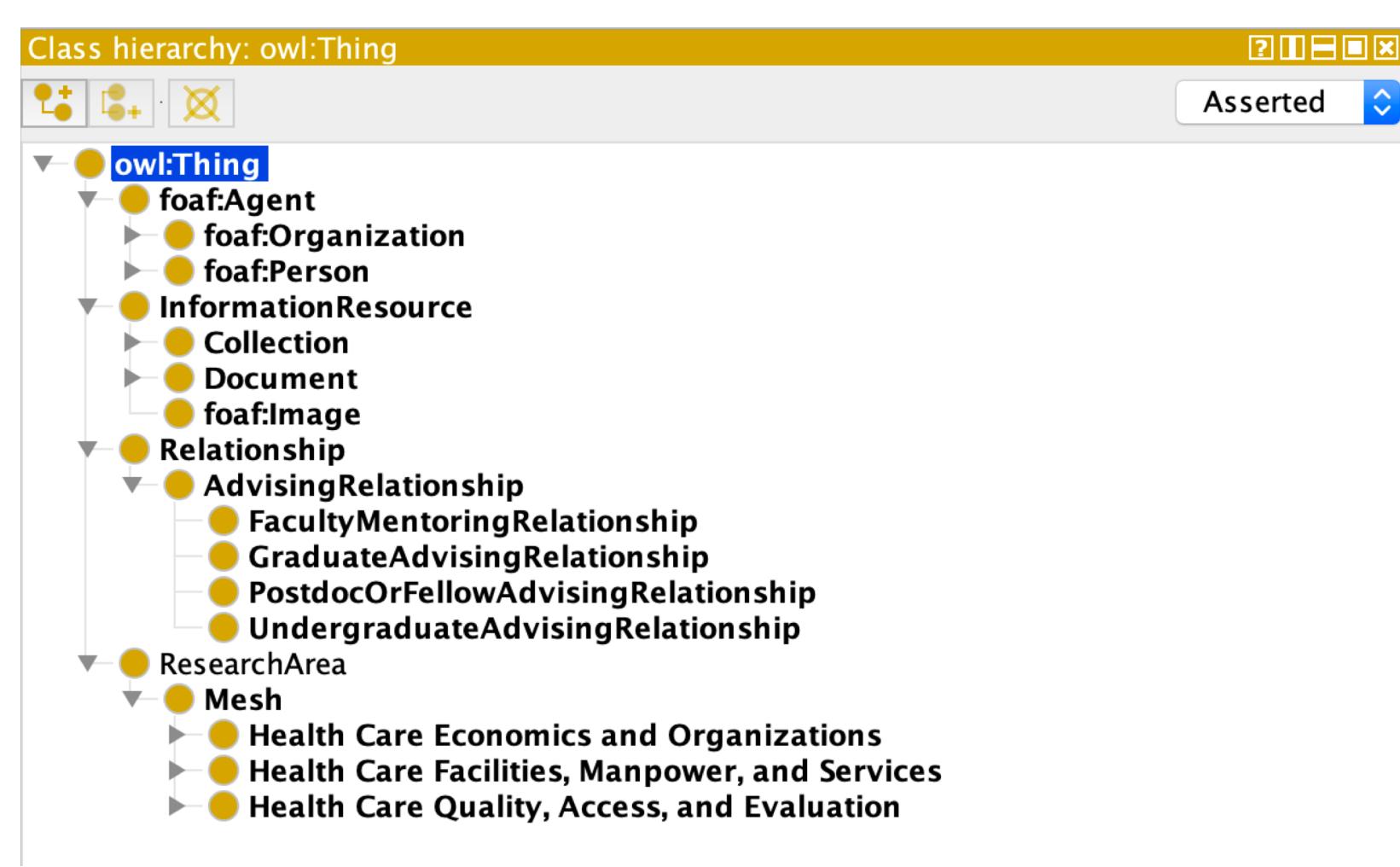


MOTIVATION

- Academic mentorship is critical in developing young scientists¹ but few tools exist to help students find and filter research mentorship².
- We use Stanford Biomedical Department as a case study and demonstrate that publicly available data can be aggregated into an ontology and web-app to empower students to choose among potential research mentors.

ONTOLOGY, DATA & PSM

- We used VIVO³ and MESH⁴. We extended VIVO to model relationships between Stanford departments, faculty, students and research areas. MESH ontology provided a lexicon of research area terms (we utilized healthcare terms).
- We model our system in OWL in Protégé using DL. The most important classes are FacultyMember, Student, AcademicPaper, and ResearchArea.
- Data was scraped from websites: Stanford Biosciences Department, BioX, School of Medicine and Pubmed using Selenium and Python. We used owlready2⁵ to query and populate the ontology and Tkinter to build a GUI.
- Faculty were matched to queries using DL rules and HermiT1.3.8 reasoner. App creates python dictionaries of the ontology instances on load.



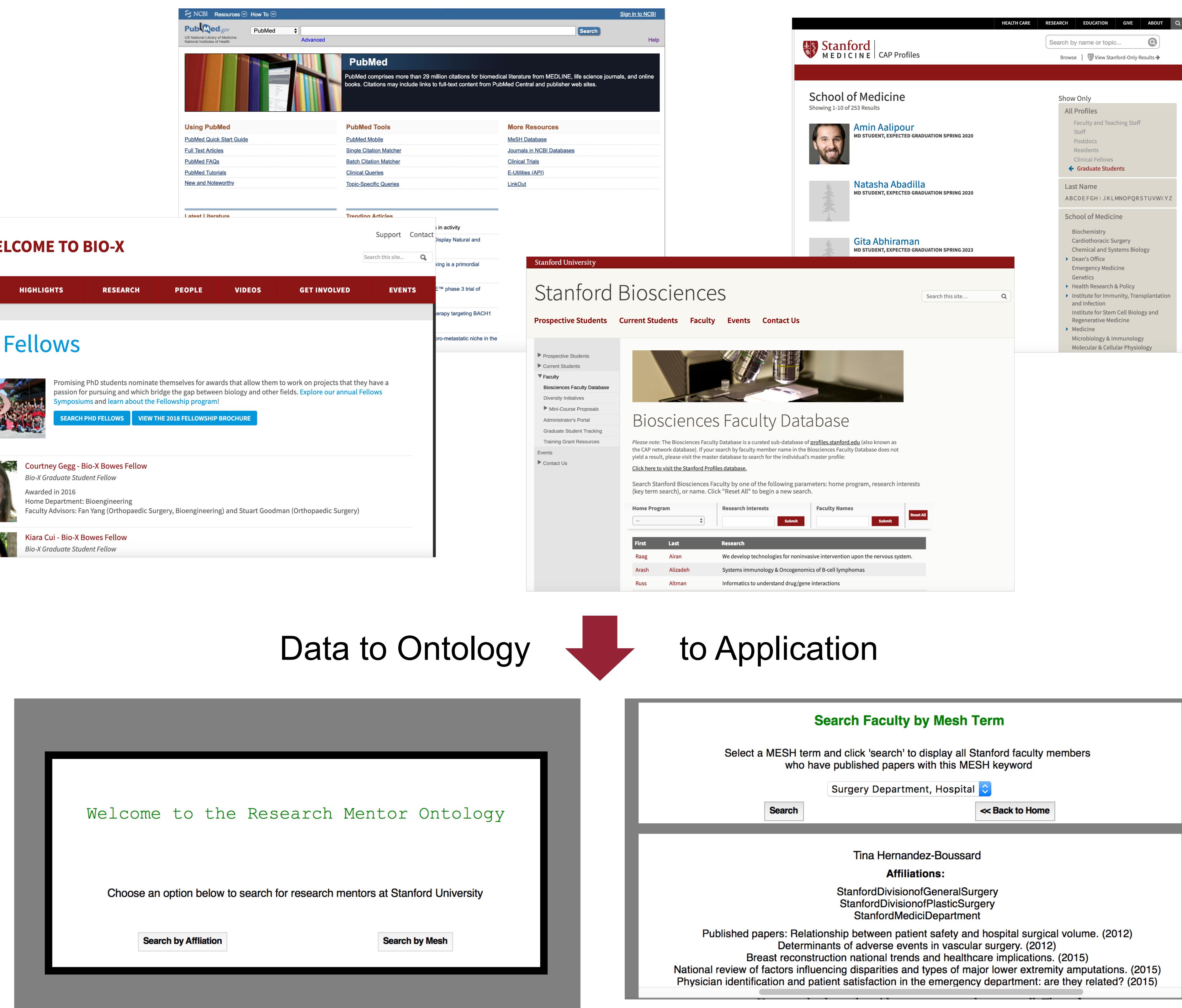
EVALUATION

- We conducted a formative evaluation of completeness and accuracy of our search features.
- 4 graduate students working in 4 lab groups were asked to report what research terms should return their lab group and what lab groups they considered while searching opportunities.

$$\text{Completeness} = \frac{\# \text{ Searched lab groups found in RM Ontology}}{\# \text{ Lab groups searched by students}}$$

$$\text{Accuracy} = \frac{\# \text{ Reported Terms found Researcher in ontology}}{\# \text{ Reported Terms linked to Researcher}}$$

Reported Search Term	Lab Group	Ontology Returns
Delivery of Health Care	Bejerano	No
Health Planning	Nigam Shah	No
Delivery of Health Care	Nigam Shah	Yes
Social Control, Formal	Riju Das	No
Public Health	Riju Das	Yes
Quality of Health Care	Riju Das	Yes
Health Services Research	Sanjay Basu	Yes
Technology Assessment, Biomedical	Sanjay Basu	No



RESULTS

- Users can search through 611 students, 440 faculty, 615 academic publications, 1662 MESH subclasses spanning health category.
- Users can explore faculty affiliations, recent publications, publication productivity and associated students.
- 34% of search terms reported the target researcher (N=38), 100% of searched faculty members were present in the ontology (N=10).

DISCUSSION & FUTURE WORK

- Future work would include improving accuracy of our search by better linking PubMed data to directory data and expanding search term set, and
- Reducing missing or incorrect student-lab links (new members or non-publishing members) by allowing lab groups to login to the app.
- We demonstrate a scalable method using public data and existing ontologies to assist in research mentor search.