



The AutoAdapt Project

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Automatic Adaptation of Knowledge Structures for Assisted Information Seeking



Presentation Structure

1. Project Background
2. Prototype Description and Demo
3. Questions



Project Background



General Project Details

- ▶ EPSRC funded project
- ▶ Budget of £250,000 approx.
- ▶ Duration of 3 years
- ▶ 2 full time researchers (now additional part-time)
- ▶ 5 other project members



Team Members

University of Essex

- ▶ Stephen Dignum*
- ▶ Udo Kruschwitz
- ▶ Maria Fasli

Robert Gordon University

- ▶ Yunhyong Kim*
- ▶ Dawei Song
- ▶ Ulises Cervino**

Open University

- ▶ Anne De Roeck

Centre of Research and Technology - Thessaly

- ▶ Nikolaos Nanos

*Full Time

**Part Time



AutoAdapt in a Nutshell

- ▶ Use domain knowledge to provide query suggestions
- ▶ Adapt domain knowledge automatically over time using *enriched* user log information (implicit feedback)
- ▶ Adaptation algorithms provide project novelty

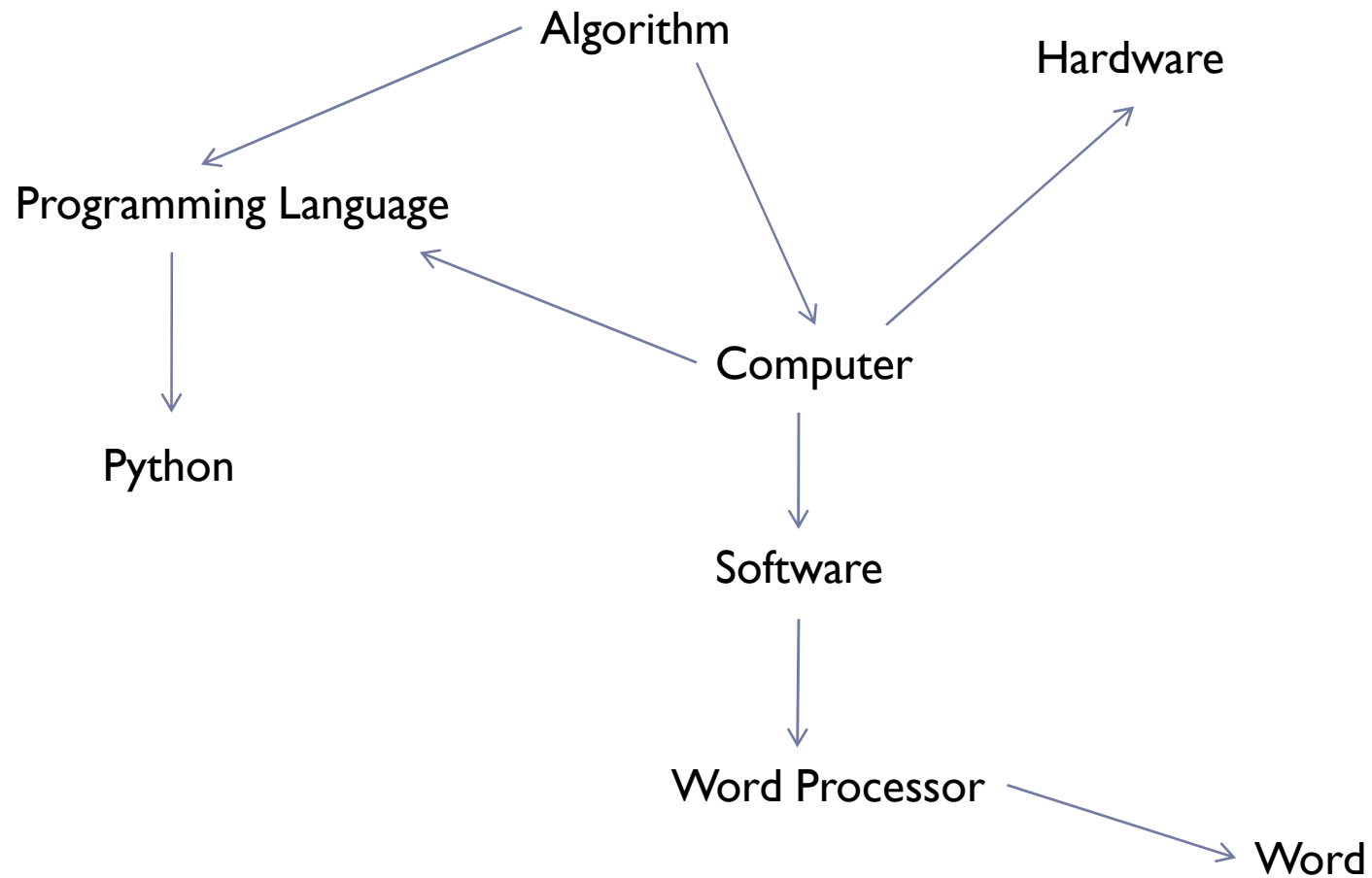


Domain Knowledge

- ▶ A number of models exist in the literature but all can be generalised to the following common form:
 1. A graph where nodes represent index/query terms, arcs represent relationships between them
 2. Differences arise in term and relationship weighting methods
 3. Relationship types are of a limited nature (however, we have coded for other relationship types)



Domain Knowledge Example



Adaptation Algorithms

- ▶ Collect new terms and relationships (and types)
- ▶ Assign weights to new terms and relationships
- ▶ Update weights of existing terms and relationships
- ▶ Removal of outdated terms and relationships



Evaluation

- ▶ Evaluation forms a major component of the project and is carried over three work packages for a total of 21 months
- ▶ We wish to identify the most promising techniques and to test against a number of baselines
- ▶ Two information seeking scenarios:
 1. Information Search
 2. Browsing / Exploratory Search



Work Packages

1. Construction of a basic search framework (3 months)
2. Domain model creation (6 months)
3. Development of evolving domain model (12 months)
4. Evaluation and refinement 1 (9 months)
5. Evaluation and refinement 2 (6 months)
6. Application to browsing (6 months)
7. Build Web Service (3 months)



AutoAdapt Demonstration



Demonstration Aims

- ▶ Provide a domain model that will encode term relations that can assist user search
- ▶ Query refinements are suggested by proposing terms, extracted from the domain model, that can be added to the user query
- ▶ Terms are selected by traversing a 'segment' of a domain model
- ▶ Centre of domain model segment determined by user query terms or those extracted from search results based on those terms

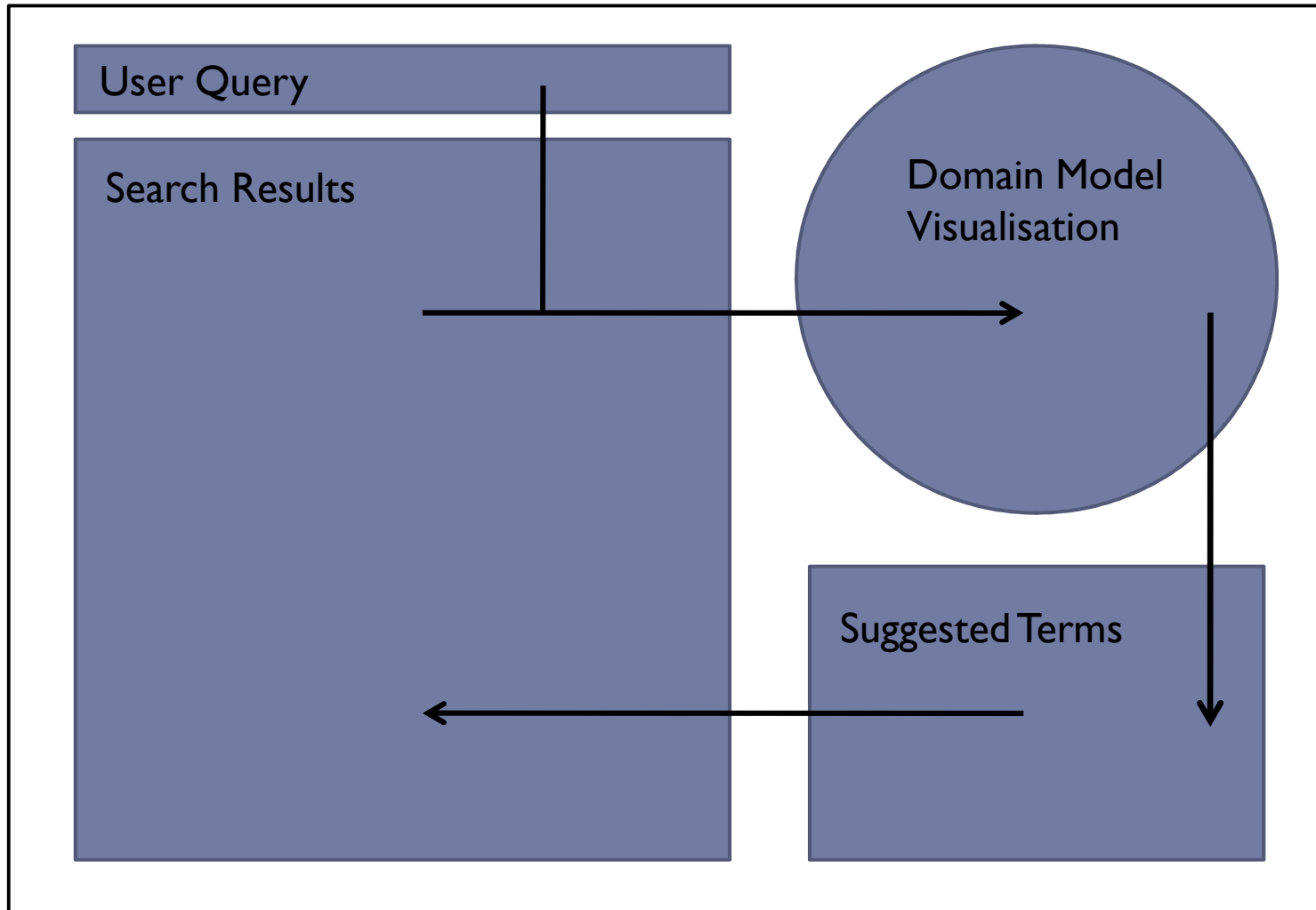


Search Engine & Document Collections

- ▶ Lucene has been chosen as the basic component for search by Essex
- ▶ The Nutch 'web integrated' implementation of Lucene has been chosen by RGU
- ▶ Essex Intranet was crawled using Heritrix
- ▶ RGU Intranet was crawled using Nutch



User Interface Interaction Style



AutoAdapt Demo

<http://autoadapt.essex.ac.uk:8080/AA Term Model/>



User Logging

- ▶ Four interaction scenarios:
 1. User query -> number of links displayed, graph displayed, suggested terms displayed
 2. User moves about graph -> graph changes, suggested terms change
 3. User chooses term -> update query, back to 1
 4. User goes to next page of links -> back to 1



User Logging Database Structure

Wish to capture:

1. Traditional query terms / URLs selected information
2. The domain model presented
3. Traversal of the model
4. Terms selected for query refinement

▶ 2 & 3 also represent novelty



Next Steps

- ▶ Decide if other interaction styles are required (simplifying query modifications, use of Tag Clouds, simpler graphs, etc)
- ▶ Test user logging
- ▶ Obtain a collection of starting domain models
- ▶ Develop adaptation algorithms
- ▶ Determine evaluation methods
- ▶ Release unto an unsuspecting public!



Questions

