

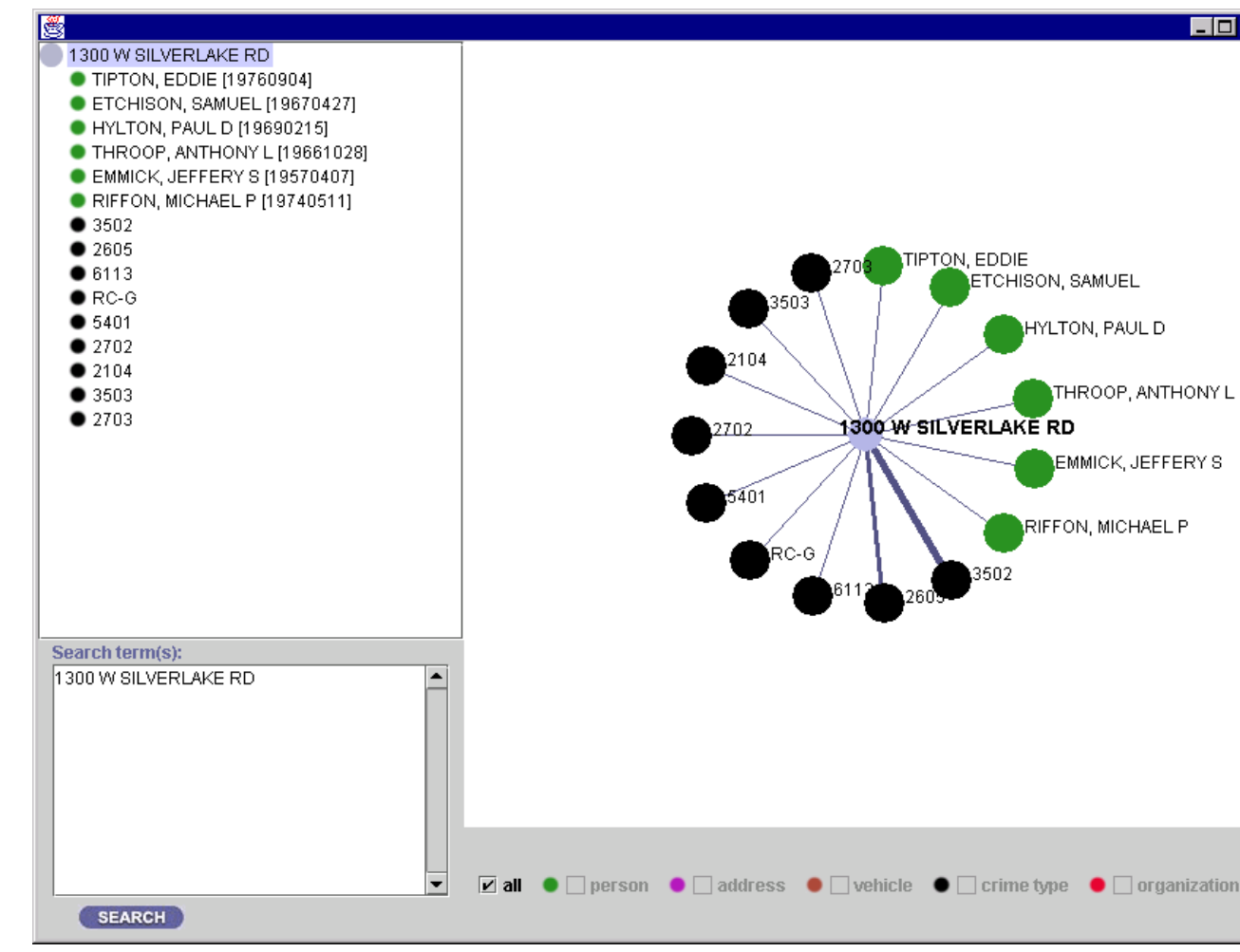
## Hyperbolic Tree

### Basics of hyperbolic tree

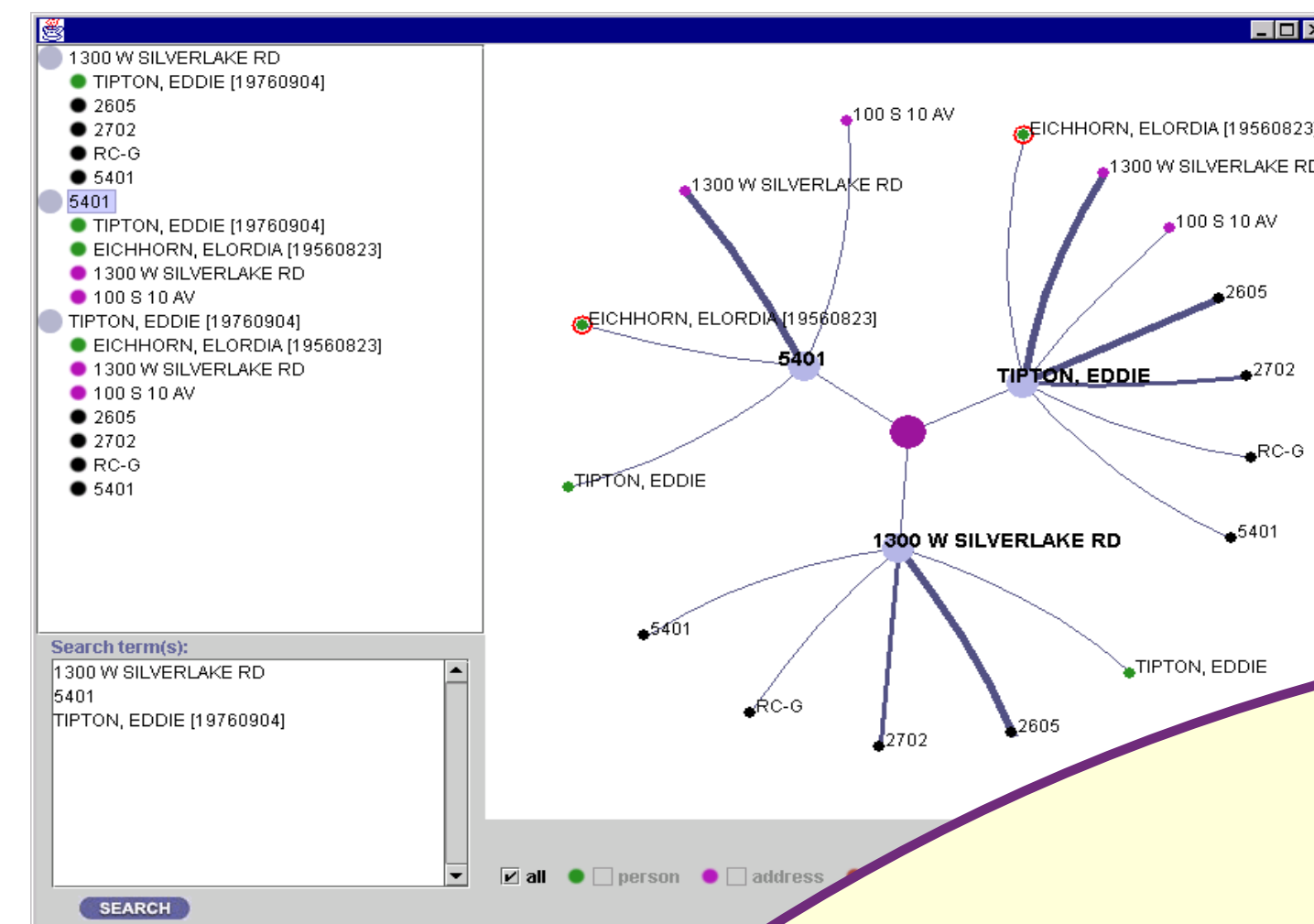
- Focus + Context
- Distorted view of tree

### Algorithm

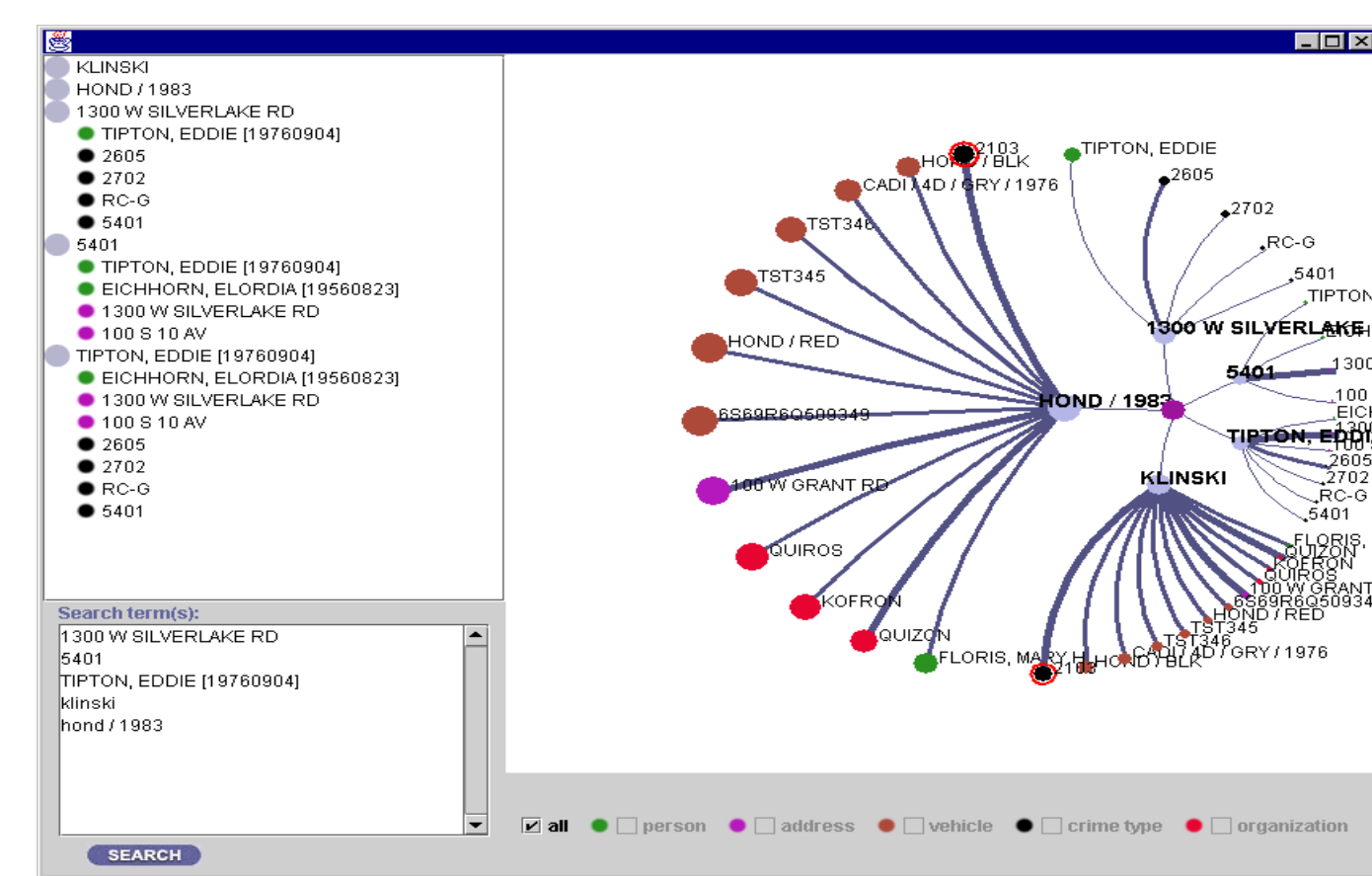
- A. Hadjiprocopis <http://www.soi.city.ac.uk/~livantes/PROGRAMS/HyperbolicTree/hyperbolic.html>
- The angle of each sub-tree is as big as the angle of its parent
- Exponentially more space is available with increasing distance from center



One search term

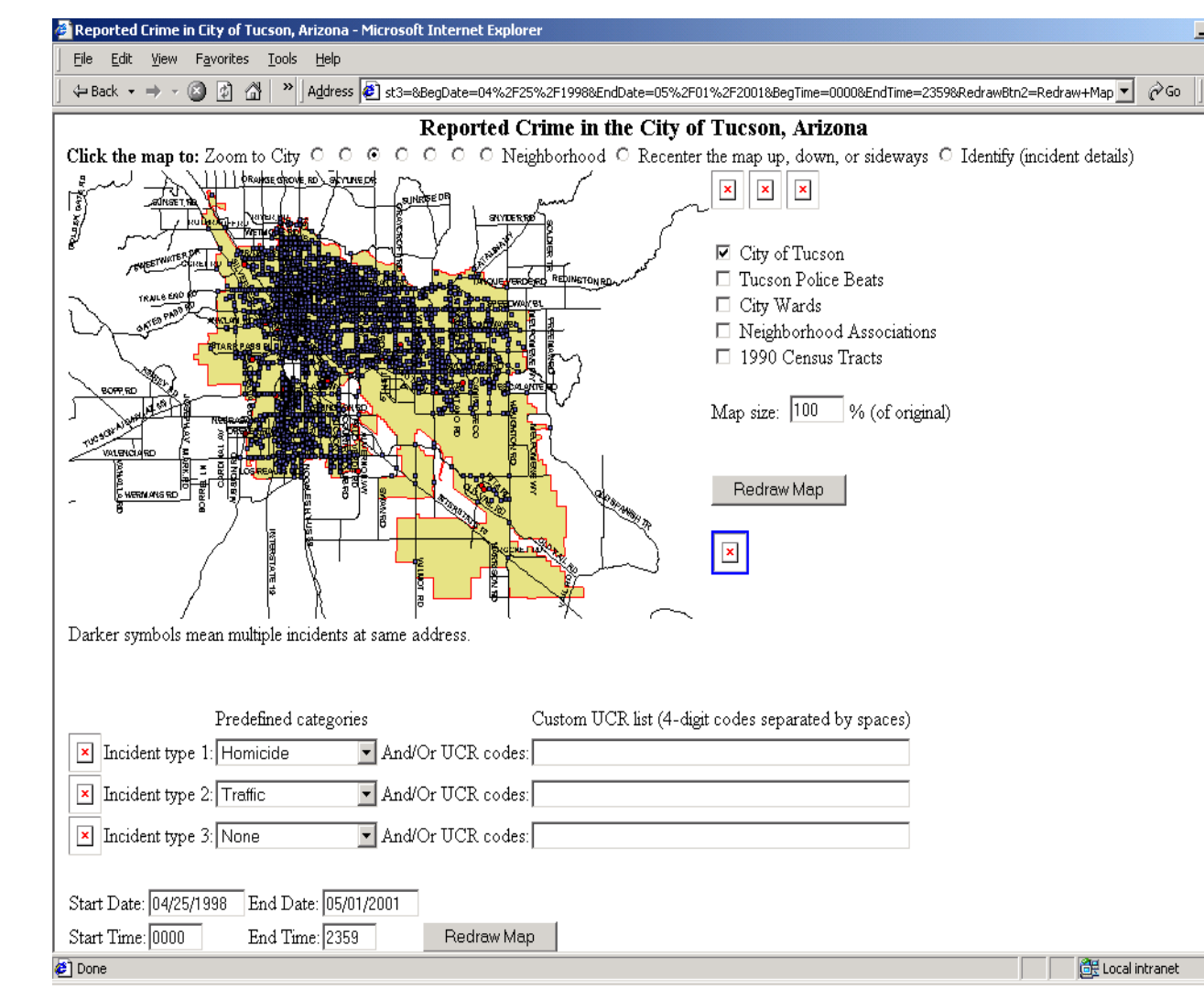


Three search terms

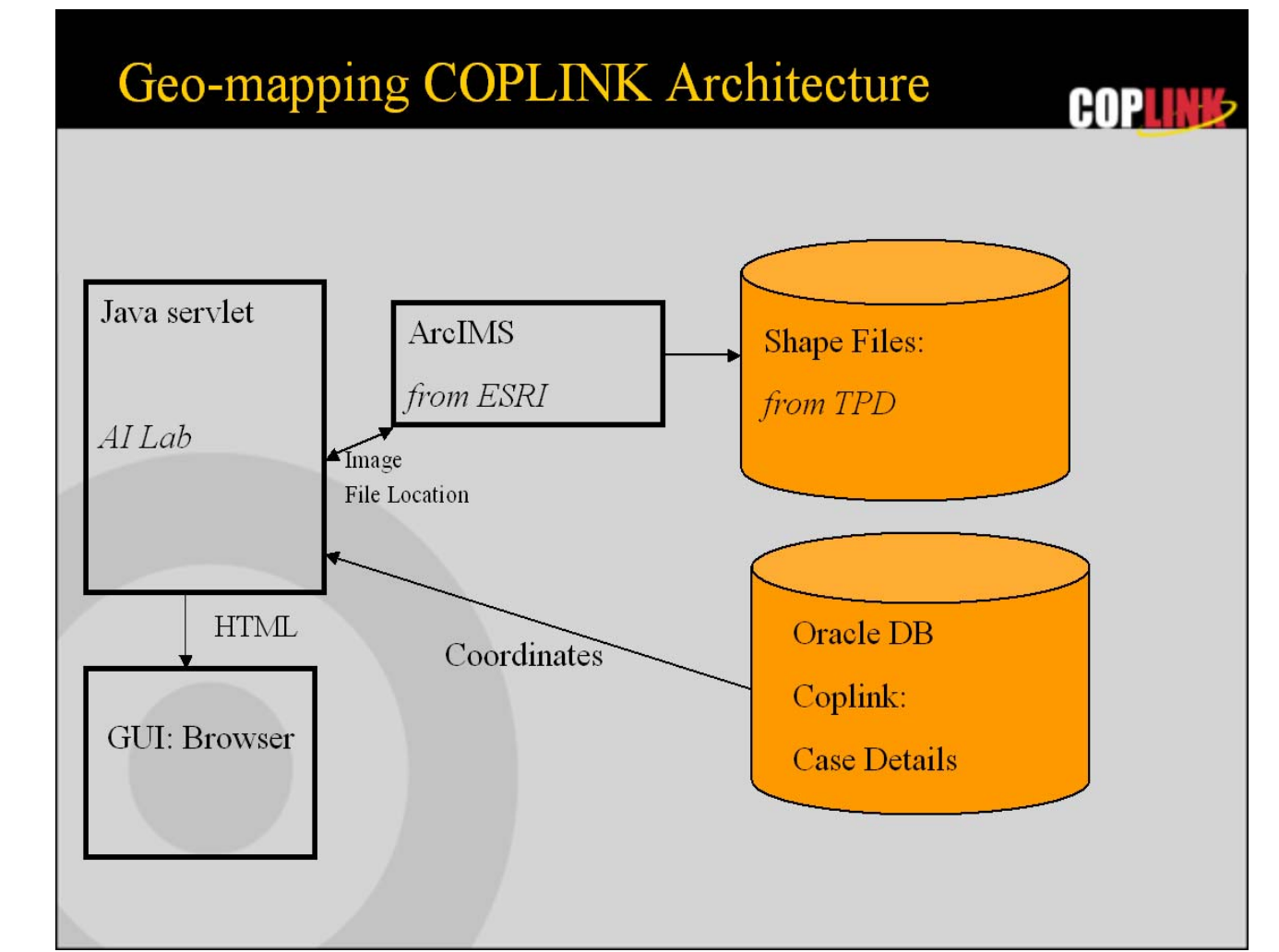


Five search terms with change of focus

## Geo-Mapping



Homicide and traffic incidents displayed on map



- Given a location on the map of Tucson, shows a link to the case number
- Given a map location, shows case details for an incident
- Given a case, will show the location on the map

# COPLINK

## Knowledge Management for Law Enforcement: Textual Analysis, Visualization and Collaboration



**AI LAB, Dept. of MIS  
University of Arizona**

**Tucson Police  
Department**

**Phoenix Police  
Department**

**NSF grant no. EIA-9983304**

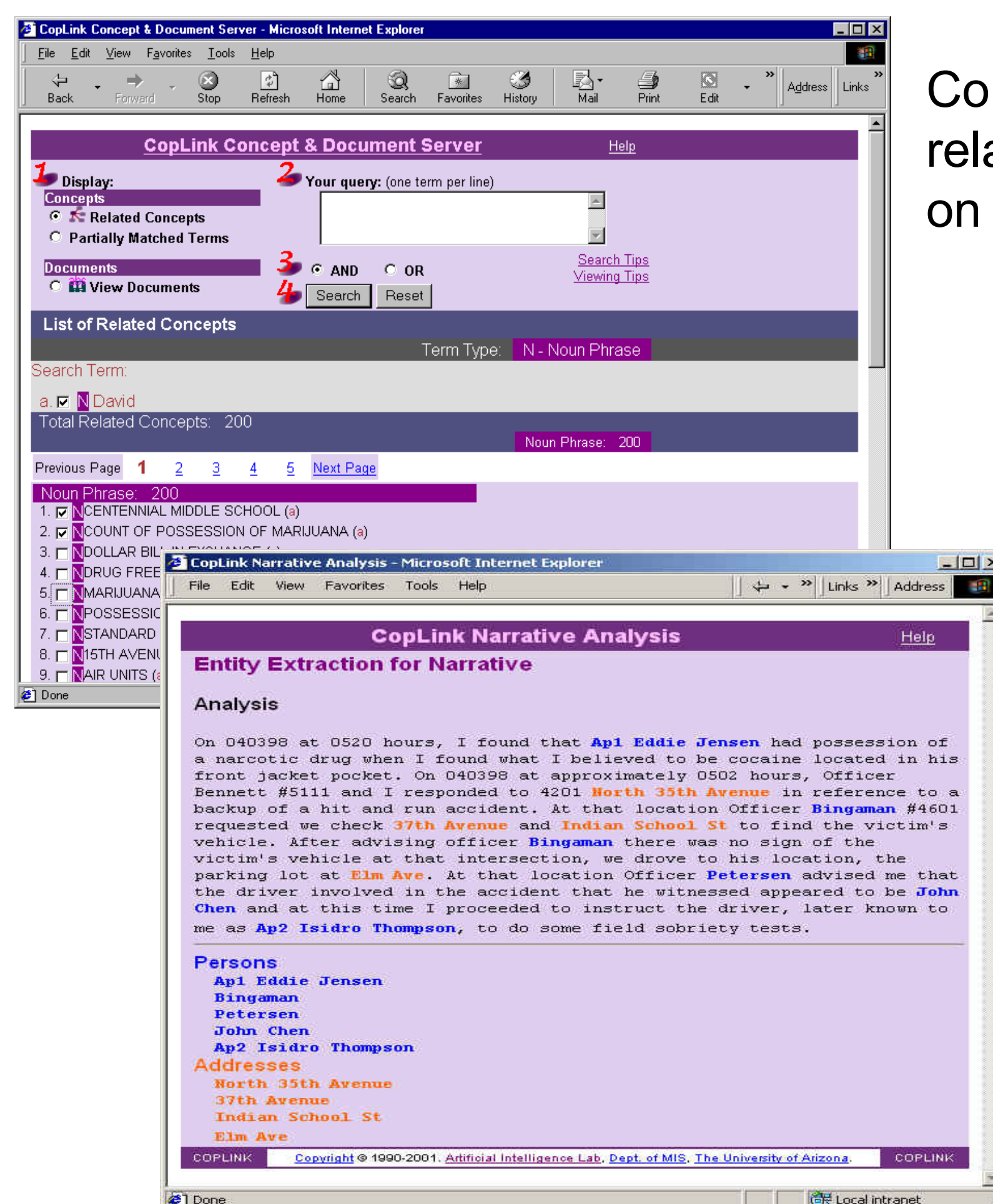
## Textual Analysis

### Data Set and Preprocessing

- Source: PPD narrative data (1998)
- Selected crime type: Narcotics
- Size: 1300 narcotic related cases
- Format: Plain text to SGML
- Selection of stop terms: Iterative improvement

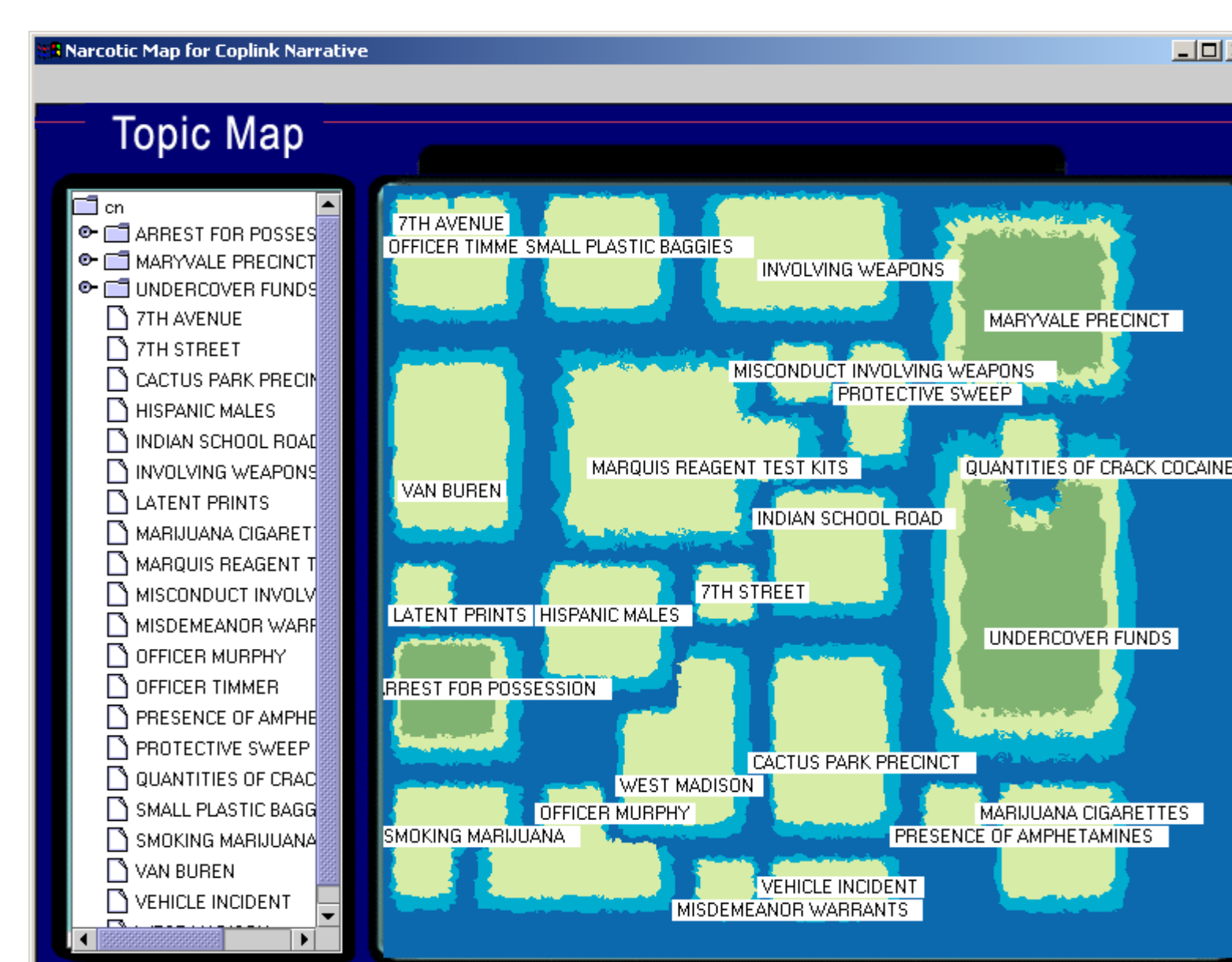
### Arizona Noun Phraser (AZNP)

- Concept Space Construction
- Self-Organizing feature Map (SOM)
- Entity Extraction



Concept Space generated related terms for user query on "David"

Entities identified as Person or Address



SOM categorized view of narcotics cases

## Collaboration

### Objective

- Develops an architecture for information sharing and collaboration in the law enforcement domain

### User Requirement Study

- Interviews and focused group studies were conducted at the Tucson Police Department

### Functionalities desired but not currently available

- Monitor data on an entity or a search query
- Locate sergeants/detectives in other units who work on related cases.
- Share useful information for investigation

### Technical Requirements

- Security is of utmost importance
- Confidentiality/Anonymity: People may not be willing to share data

### Functions of System Modules

- Information Access and Monitoring
  - Retrieves and combines useful data from distributed data sources
  - Schedules periodic monitoring of data sources using agents
- Security and Confidentiality Management

- Ensures secure access of data
- Allows users to specify the desired levels of sharing and confidentiality
- Collaboration

- Applies data mining techniques
- Recommends data sources to user based on information needs
- Identifies detectives working on similar cases

