ITTALKS

A Semantic Web Application

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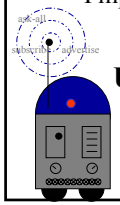
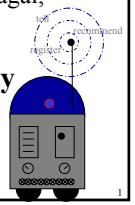
University of Maryland Baltimore County
UMBC





Semantic Web Working Symposium
July, 2001

Overview

1. ITTALKS web application.
2. Some advanced capabilities.
3. How did DAML help?
4. Future work.

Joint work with JHU/APL and MIT/Sloan.

See http://umbc.edu/~finin/papers/swws01/ for slides

UMBC/JHU/MIT DAML Project

UMBC, JHU, and MIT are working together on a set of issues under funding from the DARPA DAML program

UMBC (Finin, et. al.) is focused on integrating communicating agents, DAML and the Web

JHU APL (Mayfield, et. al.) is building information indexing and retrieval systems that work with documents and queries that contain a mixture of free text, XML and DAML

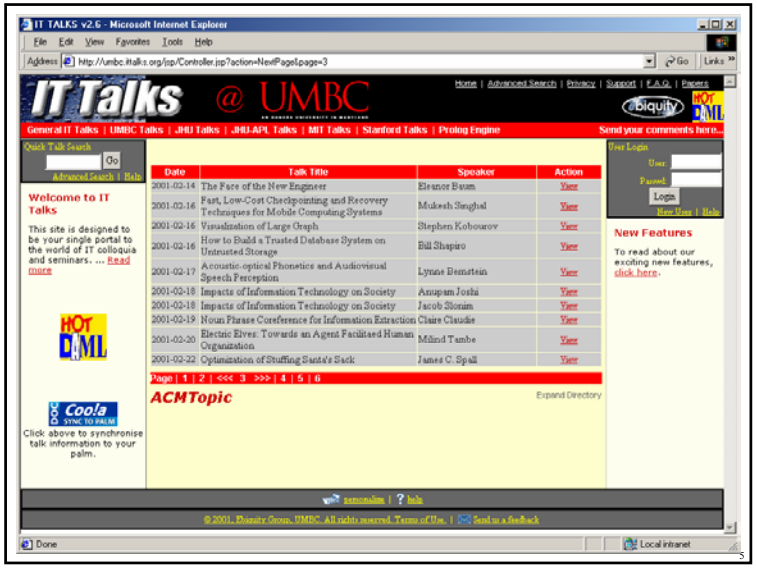
MIT Sloan School (Grosof et. al.) is developing techniques for integrating rule based technology and distributed belief into DAML

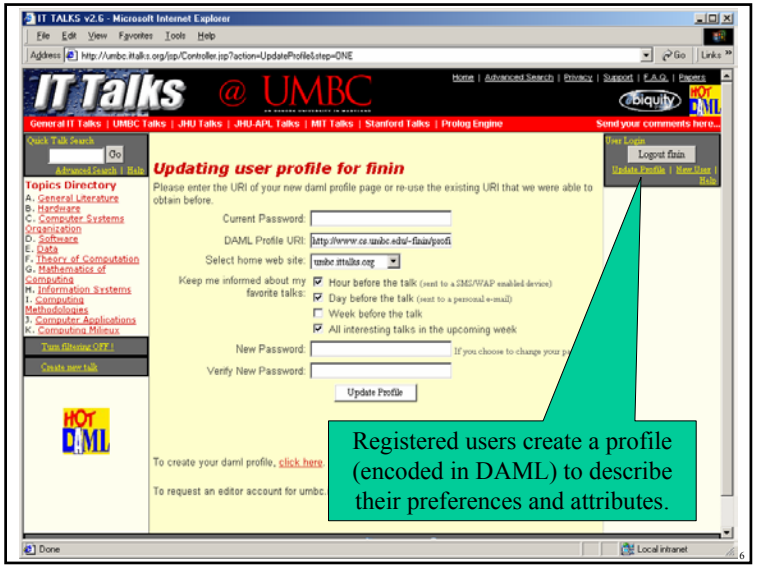
To be integrated in agent-based applications involving search and using rule-based reasoning.

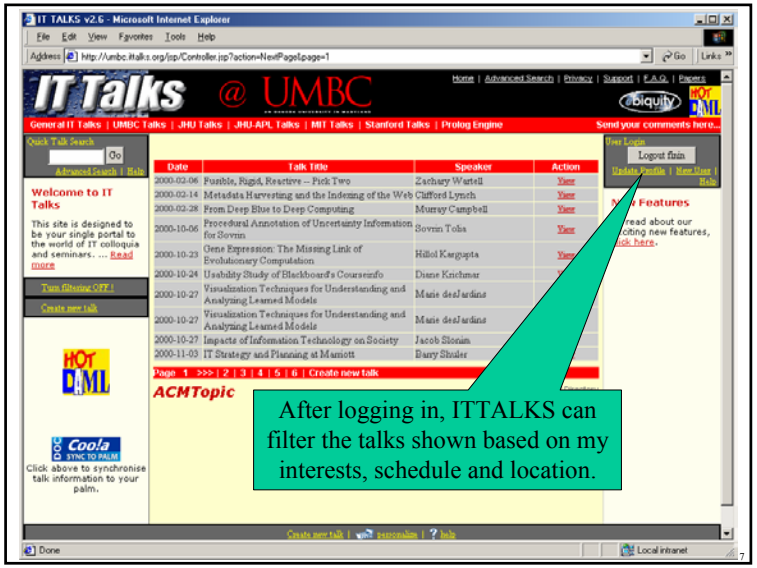
1 ITTALKS

http://ittalks.org/

- **ITTALKS** is a database driven web site of IT related talks at UMBC and other institutions. The database contains information on
  - Seminar events
  - People (speakers, hosts, users,…)
  - Places (rooms, institutions,…)
- This database is used to dynamically generate web pages and DAML descriptions for the talks and related information.
- Notifications are sent to registered users and/or their agents via email, SMS, WAP, and/or KQML for talks matching their interests, location and schedule.


IT TALKS v2.6 - Microsoft Internet Explorer
IT Talks @ UMBC
Welcome to IT Talks
This site is designed to be your single portal to the world of IT colloquia and seminars. ... Read more
Click above to synchronise talk information to your palm.
Date
Talk Title
Speaker
Action
2001-02-14 The Face of the New Engineer Eleanor Baum View
2001-02-16 Fast, Low-Cost Checkpointing and Recovery Techniques for Mobile Computing Systems Mukesh Singhal View
2001-02-16 Visualization of Large Graph Stephen Kobourov View
2001-02-16 How to Build a Trusted Database System on Untrusted Storage Bill Shapiro View
2001-02-17 Acoustic-optical Phonetics and Audiovisual Speech Perception Lynne Bernstein View
2001-02-18 Impacts of Information Technology on Society Anupam Joshi View
2001-02-18 Impacts of Information Technology on Society Jacob Slonim View
2001-02-19 Noun Phrase Coreference for Information Extraction Claire Claudie View
2001-02-20 Electric Elves: Towards an Agent Facilitaed Human Organization Milind Tambe View
2001-02-22 Optimization of Stuffing Santa's Sack James C. Spall View
Page | 1 | 2 | <<< 3 >>> | 4 | 5 | 6
ACMTopic
New Features
To read about our exciting new features, click here.


IT TALKS v2.6 - Microsoft Internet Explorer
IT Talks @ UMBC
Updating user profile for finin
Please enter the URI of your new daml profile page or re-use the existing URI that we were able to obtain before.
Current Password:
DAML Profile URI:
Select home web site:
Keep me informed about my favorite talks:
Hour before the talk (sent to a SMS/WAP enabled device)
Day before the talk (sent to a personal e-mail)
Week before the talk
All interesting talks in the upcoming week
New Password:
Verify New Password:
Update Profile
To create your daml profile, click here
To request an editor account for umbc
Registered users create a profile (encoded in DAML) to describe their preferences and attributes.


IT TALKS v2.6 - Microsoft Internet Explorer
IT Talks @ UMBC
Welcome to IT Talks
Click above to synchronise talk information to your palm.
Date
Talk Title
Speaker
Action
2000-02-06 Fusible, Rigid, Reactive -- Pick Two Zachary Wartell View
2000-02-14 Metadata Harvesting and the Indexing of the Web Clifford Lynch View
2000-02-28 From Deep Blue to Deep Computing Murray Campbell View
2000-10-06 Procedural Annotation of Uncertainty Information for Sovrin Sovrin Tolia View
2000-10-23 Gene Expression: The Missing Link of Evolutionary Computation Hillol Kargupta View
2000-10-24 Usability Study of Blackboard's Courseinfo Diane Krichmar View
2000-10-27 Visualization Techniques for Understanding and Analyzing Learned Models Marie desJardins View
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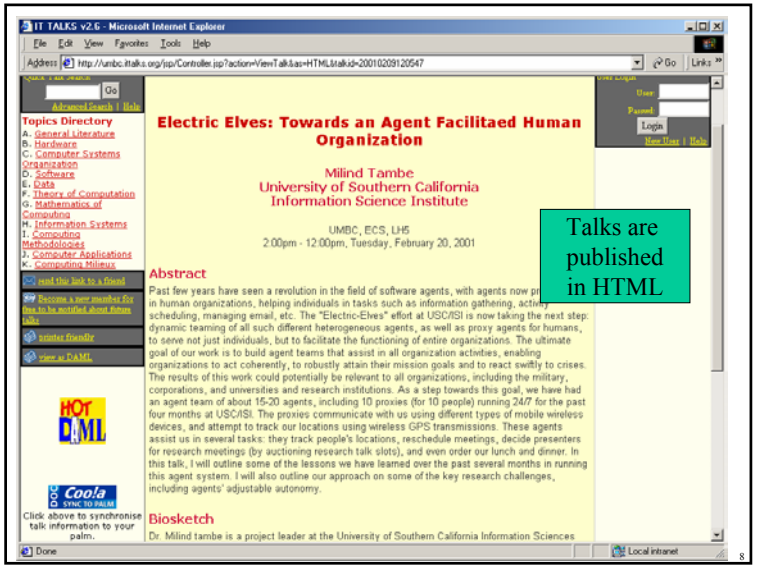
2000-10-27 Impacts of Information Technology on Society Jacob Slonim View
2000-11-03 IT Strategy and Planning at Marriott Barry Shuler View
Page 1 >>> | 2 | 3 | 4 | 5 | 6 | Create new talk
ACMTopic
Logout finin
After logging in, ITTALKS can filter the talks shown based on my interests, schedule and location.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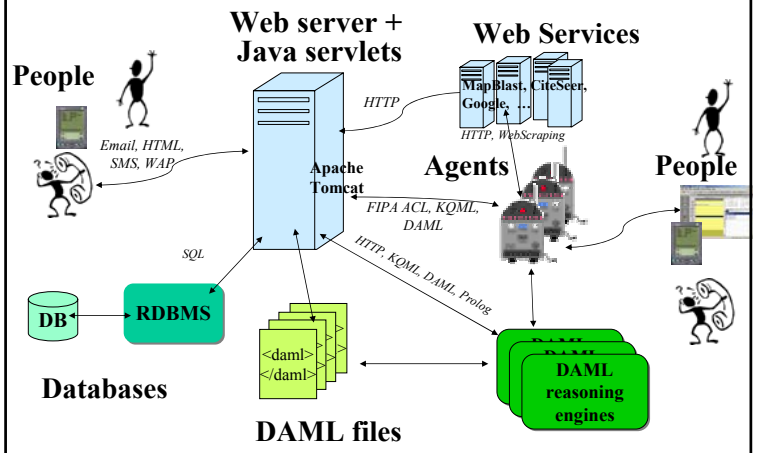
Electric Elves: Towards an Agent Facilitaed Human Organization
Milind Tambe
University of Southern California
Information Science Institute
UMBC, ECS, LH5
2:00pm - 12:00pm, Tuesday, February 20, 2001
Abstract
Past few years have seen a revolution in the field of software agents, with agents now p
in human organizations, helping individuals in tasks such as information gathering, activ
scheduling, managing email, etc. The "Electric-Elves" effort at USC/ISI is now taking the next step:
dynamic teaming of all such different heterogeneous agents, as well as proxy agents for humans,
to serve not just individuals, but to facilitate the functioning of entire organizations. The ultimate
goal of our work is to build agent teams that assist in all organization activities, enabling
organizations to act coherently, to robustly attain their mission goals and to react swiftly to crises.
The results of this work could potentially be relevant to all organizations, including the military,
corporations, and universities and research institutions. As a step towards this goal, we have had
an agent team of about 15-20 agents, including 10 proxies (for 10 people) running 24/7 for the past
four months at USC/ISI. The proxies communicate with us using different types of mobile wireless
devices, and attempt to track our locations using wireless GPS transmissions. These agents
assist us in several tasks: they track people's locations, reschedule meetings, decide presenters
for research meetings (by auctioning research talk slots), and even order our lunch and dinner. In
this talk, I will outline some of the lessons we have learned over the past several months in running
this agent system. I will also outline our approach on some of the key research challenges,
including agents' adjustable autonomy.
Biosketch
Dr. Milind tambe is a project leader at the University of Southern California Information Sciences
Talks are published in HTML

ITTALKS Ontologies

- We've defined and use the following ontologies, all at http://daml.umbc.edu/ontologies/
  - **calendar-ont.daml** – calendar and schedule info
  - **classification.daml** – ACM CCS topics
  - **dist-trust.daml** – distributed trust concepts
  - **person-ont.daml** – people and their attributes
  - **place-ont.daml** – talk locations
  - **profile-ont.daml** – user modeling info
  - **talk-ont.daml** – talks info
  - **topic-ont.daml** – topics and interests

ITTALKS Architecture



2 Advanced Capabilities and features

- **Topic ontologies**
  - *Automatic classification* of talks and users w.r.t. DAML topic ontologies.
  - Support for multiple topic ontologies, with manual and *automatic mapping* between pairs of topic ontologies.
- **Agents**
  - Using DAML as a *FIPA compliant ACL*
  - *DAML reasoning engine* (XSB, YAJXB, RDF API)
  - *Intelligent agents* that accept DAML talk notifications and make entries on a user's calendar if it matches the user's interests, location and schedule.
- **Distributed trust**
  - A *DAML distributed trust model* for ITTALKS security and authorization.

What are talks about?

- Topic hierarchies provide indexing terms
  - ACM CCS topic hierarchy
  - *Open Directory*
- Encoded as DAML ontologies
- These allow users to specify interests as well as browse the database of talks by topic
- Automatic classification of talks (based on title and abstract) *and users (based on his web pages, CV, papers, etc.)*
- *Discovery of mapping rules between CCS to OD ontologies using IR techniques*

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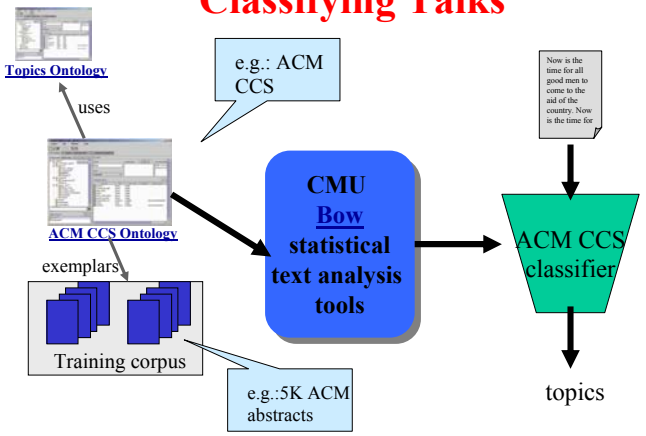
Classifying Talks



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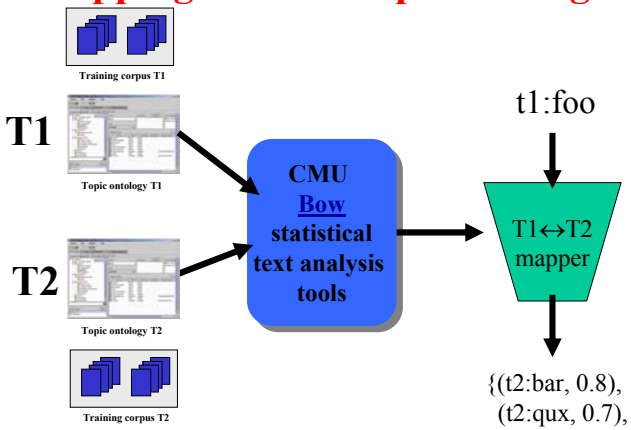
Mapping between topic ontologies



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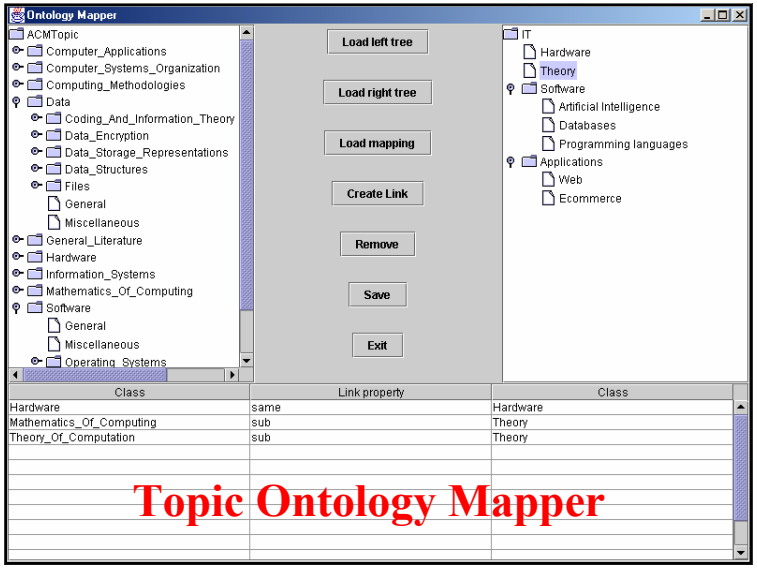


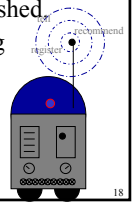
Topic Ontology Mapper

Topic Mapping

- Topic ontology includes relationships between terms in two different topic ontologies
  - Similar, broader, narrower
- User can link some "landmark" topics
- Classification system generates similarity scores
- Induced relationships must be consistent with user's links and constraints
- Induced relationships further weighted by hierarchical information

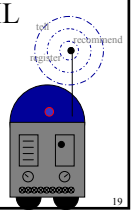
DAML and Agents

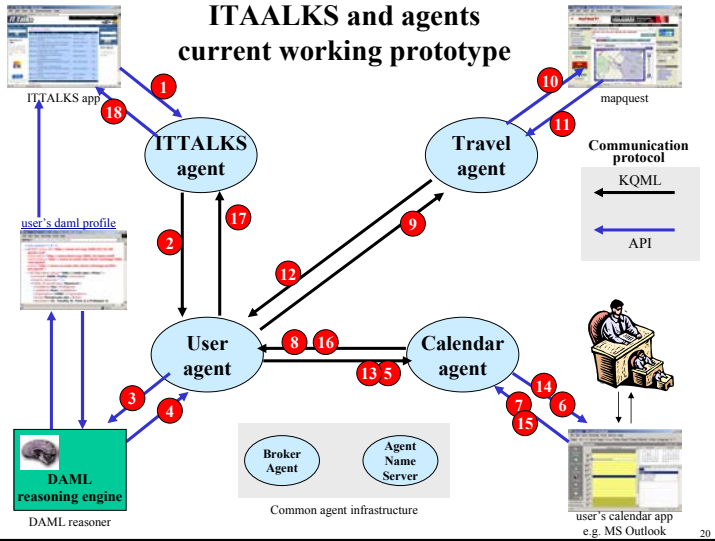
- Much multi-agent systems work is grounded in ACLs (eg KQML, FIPA) and associated software infrastructure (eg DARPA Grid)
  - The paradigm has been peer-to-peer, message oriented communication mediated by brokers and facilitators.
- The SW invites different paradigms which will require some changes in ACLs and their associates software systems.
  - Agents "publish" beliefs, requests, delegations, and other "speech acts" on SW.
  - Agents search for & "discover" what peers have published
  - Some agents "speak for" a set of SW pages, answering queries about their content
- The software agent research community is very interested in the semantic web and DAML



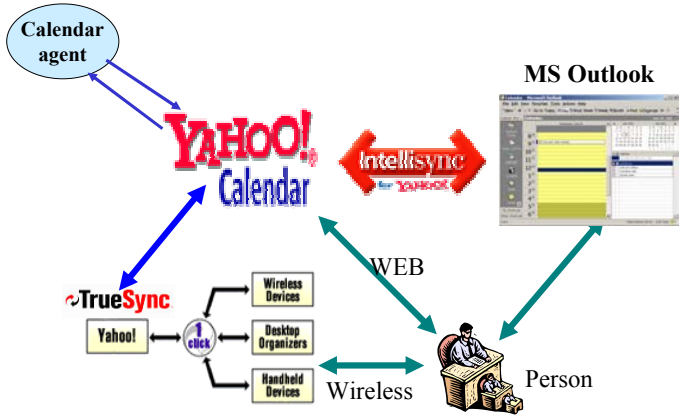
ITTALKS Agent

- ITTALKS offers a web interface for its human users and can send notifications to humans via email, WAP and SMS.
- We are also developing an agent API so that software agents can interact with ITTALKS.
- Currently, the ITTALKS agent can send notifications to agents via KQML using DAML as the "content language".
  - We will support richer, mixed initiative dialogs between ITTALKS and agents in the future





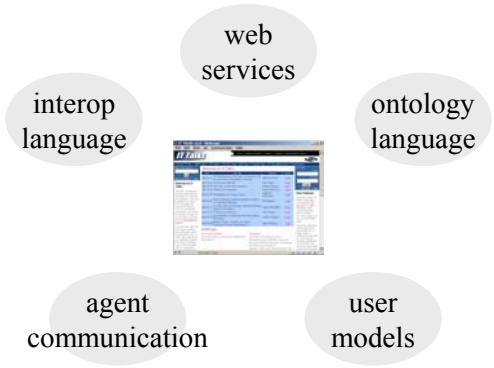
Our Current Calendar Solution



3 How Does DAML Help?

- Does it Help? Yes
  - We've identified five general areas in which DAML added value or facilitated building or maintaining our application
- Is DAML needed? No
  - Not strictly (yet), although the alternative technologies are not designed for the web and thus suffer from deficiencies.
- What's missing?
  - DAML isn't the ultimate semantic web language and gthere's still a serious lack of SW tools

How does DAML Help?



DAML as an Interop Language

- Information in ITTALKS is exposed or published in DAML on the web.
- Future versions of ITTALKS will import information from other event sites via DAML (e.g., UMBC's campus calendar).
- DAML's descendant will become the "semantic interlingua" for applications and systems.

DAML as an Ontology Language

We used DAML as

- As a DB conceptual schema language
- To help specify APIs
- To aid human understanding
- A way to allow the user to view talks via their own model of the domain

DAML as a User Modeling Language

DAML is used to encode common user models that

- Are stored in the user's file space giving the user complete access and control
- Contain information which can be shared by many applications
- Can contain information specific to certain applications

DAML as an ACL

- DAML is used to support agent communication as a "content language" used to encode the content of a KQML message
- Future: as an encoding for an entire FIPA ACL message and as a way of publishing speech acts on web pages

What We Missed

- Lack of rules
  - Needed to describe security policies for distributed trust
- Description logic is a new formalism to most.
  - The learning curve is steep and some fall off.
- Lack of development tools
  - We used/adapted XML and RDF tools

4 Future work

- More work on agents, distributed trust, user modeling and ontology mapping
- ITTALKS is a useful, fairly sophisticated web application that used DAML in an integral way
- We can generalize this to *X*talks, an application to manage announcements of talks and other, similar kinds of events in any subject area.
- This can be simplified and packaged (and open sourced) to make it easy to install and maintain.

Just add water…

(1) Unpack *X*talks and place in a medium sized Linux box

(2) Sift the **DAML config** file

(3) Stir in one **DAML topic ontology**

(4) Optionally mix in additional **DAML event ontology** subclasses to taste

(5) Optionally top with **DAML distributed trust policy** information

(6) Sprinkle with custom HTML templates, GIFs, and CSS files as desired

And *X*talks becomes…

- bioTalks or
- lingTalks or
- historyTalks or
- yogaLectures or
- pentagonSeminars or
- bostonRaves or
- mitLcsEvents or
- …

Conclusion

- ITTALKS is a useful, fairly sophisticated web application
- The semantic web concepts and DAML in particular
  - Make it easier to develop and maintain ITTALKS
  - Support some features of ITTALKS
- Visit http://ittalks.org/
  - To use ITTALKS
  - For more information, including a paper, a demo "movie", and these slides
- mailto:info@ittalks.org to request a domain for your organization.