Kukakuka: An Online Environment for Artifact-Centered Discourse

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Mahalo to Bruce Harris, Trudy Lin, Bin Ma, and the Fall 2001 class members of ICS 463 Human Computer Interaction

Plan

- Artifact Centered Discourse and ways to support it
- Kukakuka’s design
  - Interface
  - Technical
- Lessons from Use in Practice
- Research Directions
Artifact Centered Discourse

(a.k.a. Anchored Discourse, Contextualized Discussion, Document-Centred Discourse)

- Human discourse in (face to face) learning and work uses external artifacts
  - as topics of conversation
  - as resources for conversation
- To be effective, online learning should also support ACD

Example Applications

- Project oriented computer science courses
  - Class diagrams, source code, interface mockups ...
- K-12 inquiry learning in science
  - Project plans, data visualizations, concept maps ...
- K-12 Educators engaged in professional development
  - Examples of student and teacher work
Support for Online ACD

Most commercial course management systems provide impoverished support

- Student upload areas and discussion tools are completely disjoint

Solutions

- Minimally, associate artifacts with discussions
- Better, support referencing through linkages between the two

Parallel and Embedded ACD

Optimize discourse chronology at cost of context

Optimize context at cost of discourse fragmentation
Linked ACD

- Independent discourse representation
- Linked to artifact for context

Kukakuka Design Criteria

- Linked ACD
- Focused Discussions: threads for artifacts
- Multiplicity of Artifacts: discuss multiple related artifacts
- Guarantee of Context: Artifact always visible
- Universal Artifacts: any web page regardless of location
- Ease of Access: standard web browser
Technical Motivations

- Rapid Prototyping
  - Quickly demonstrate and experiment with the concept of artifact centered discourse

- Simplicity and Interoperability
  - Build on existing newsgroup server technology without special modification or impairing other uses

- Find and Push Limitations of Browser-based Solutions

Conceptual Architecture

Discussion Group

Artifact (URL)

User

Thread

Message

Artifact (URL)
**Entry Page (earlier version)**

Welcome to the Kukakuka server for ICS463

Intro to Human Computer Interaction Design

Instructor: Dan Suthers, suthers@hawaii.edu  
Kukakuka developer: Jan Yu, jyu@hawaii.edu

News

A new version was installed 11/16/01 with some minor improvements in navigation tools. We are working on a more fundamental redesign of the internals.

Usage Notes

Use HTML for formatting. Otherwise it all runs together.

Use your email address for From and giving an informative Subject.

To create a new thread, select NEW_THREAD and manually paste the URL of the page to be imported into the Reference field. Once you have done this anyone replying to your message will have their message automatically associated with the URL you specified.

The "back" and "forward" buttons in the artificial frame only work in Netscape 4.7.

Please send feedback to kuka-developers@hawaii.edu if you have suggestions.

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**Group Page**

**ICS 463: Intro to Human Computer Interaction Design**  
Fall 2001

**Assignment 1 (Due Sept 19th)**

- Write a page "interactive screen" that explains something for your software development company. What is the company? What does it do? Why do they need it? What is the name of the project? Do you see any other projects in particular that software is to be developed?

- Some one of the methodologies in Ch. 1.10 and use for your project.

- Post the document on your web site and post on the LMS by Sept 19th. (We will publish in La.)

- Need a printed hard copy for the class on Sept 20th.

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Abstract Architecture

HTTP

Servlets

Browser

NNTP

Database

Configuring a Server

- Install Servlets
- Create desired NNTP groups if needed
- Create config file referencing NNTP server and root group
- Post initial message in each group with desired group artifact
**Message Format**

- **NNTP + Artifact Header**
  
  Path: lilt.ics.hawaii.edu/developers/hnlc4/moredesigns.htm
  
  From: viil@hawaii.edu
  
  Newsroups: kuka.lilt.hnlc-vcc.resources
  
  Subject: Re: ...even more designs
  
  Date: 16 Apr 2002 19:07:35 GMT
  
  Organization: Another Netscape Collabra Server User
  
  Lines: 10
  
  Message-ID: <a9gbn4$9r213@lilt.ics.hawaii.edu>
  
  References: <a9gbn4$9r213911@lilt.ics.hawaii.edu>
  
  

  I don't think we should have a horizontal menu and a vertical menu unless these two relate to each other. That would be like having one menu and "bend" it around the screen.

  <br>

  If you look around on the net...

- **Does not interfere with use by other clients**

- **A simple yet powerful way to contextualize messages: standardize?**
Use: Undergraduate HCI

[Diagram of a map system with text annotations]

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Use: Our own design work

[Diagram of a networked system with text annotations]

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Observations

- Quickly learned that “one group = one artifact” is inadequate
  - Most artifacts are structured or collections
  - Group = collection, thread = component

- Improved support for design oriented activities
  - Messages overwhelmingly “on task”
  - Threads short; discussion moves on to next version of artifact

- Users asked for total flexibility in linking artifacts to messages, but restricting this flexibility seemed to help

Issues

- Navigation within an artifact that has links
  - Usual problems with frames and browser “back” button changing “wrong” frame

- Security restriction on reading other frame’s URLs is problematic
  - Navigation aids
  - Automating insertion of references
  - Mailing fully contextualized messages

- Lack of user-specific state persistence

- Not integrated with the “killer app”: email

- Problems comparing multiple artifacts
Related Systems

- Annotation Engine, CoNote, and CritLink
  - Embedded ACD
  - All use proxy servers
- Ubiquitous-D3E
  - Parallel ACD on external artifacts
  - Kukakuka handles multiple related artifacts in a single discussion
- JIME, Pink
  - Linked ACD
  - Distinguished by internal versus external external

Pink: Takeda & Suthers

- Internal and external documents
- Anchored threads
- Written in Zope
- Poster session tonight
Ongoing and Future Work

- **Access Control**
  - Authentication

- **Individualization**
  - Read/unread
  - Notification services
  - Database

Integration with Email

- Notification by email
- Reply by email
  - Ensure that reader and writer see same context
- Mail a particular message including context
  - Need message and context in URL
  - But don’t reload entire page for each message
- Submit new artifacts (create new threads) by email
  - Smart parsing of messages
Coherence and Convergence

Two problems with threaded discussions:

- Coherence problems when multiple threads of discussion intertwine (Herring)
- Threaded discussion is an inherently divergent representation (Hewitt)

Convergence Artifact

- Textual "summary" area
- Concept mapping, argument maps, etc.
New Applications

- PODS: Remote Ecological Micro-Sensor Network
- Scientific and Cultural Voyages to NW Hawaiian Islands
- How is spatially and temporally organized data reflected in organization of discussion?

Integrating Representations

Discussion Topics:
- Tracking ant invaders in park
- Do clouds stop where the rainforest stops?
- Observations of Silene lifecycle

Subject: Revised cloud hypothesis
Date: Tuesday, 30 Oct 2001
From: Mira Kayshana

Was up. Rodney and the wind tracker group say there were no clouds last week because there were no trades. The trades blow the vet air to make clouds. This explains why there were no clouds last week here. S10C. I think this means we are NOT wrong about clouds! When the clouds are there they are over the forest. So I made a new cloud hypothesis and linked it in. I think it is a stronger hyp - what do you think?

Subject: Re: Revised cloud hypothesis

Hi, do you think this stays true as we go up higher? Let's check awesome on engine <320>
Conclusions

- Social interaction and representational aids are important in learning
- Improved support for Artifact Centered Discourse is needed (especially “linked ACD”)
- Reuse of open-standard system enabled us to quickly build a useful prototype
  - Limitations encountered will require database and client-side processing
- Coordination of multiple representations is a promising area for research

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Thank you

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