Accessible Information Technology

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History of the HearSay Project

- Motivated by:
  - Information extraction from web pages
  - Artificial Intelligence
  - Process modeling
  - Speech interfaces

- Funding:
  - NSF: IIS-0534419, CNS-0751083, IIS-0808678
  - National Institute for Disability and Rehabilitation Research: H133590055

- Collaborating with:
  - Helen Keller Services for the Blind
  - IBM Research: Tokyo & Almaden Labs
  - Universities: Uni of Washington, Uni of Rochester, and Arizona State Uni

The Vision of Universal Accessibility

[Diagram showing Modalities, Devices, Repository, and WWW connections]
Content Segmentation

Finding What is Relevant

Context-Driven Browsing
Finding Changed Content

Proposed Work and Deliverables

- Web content analysis techniques:
  - Page segmentation
  - Finding relevant content
  - Finding changed content

- Can be embedded into:
  - Focused crawlers and spiders: 6 months
  - Tools for data integration: 6 months
  - Mash-ups: 6 months

- Impact:
  - Business intelligence

Speech-Enabled Macros
Proposed Work and Deliverables

- Deliverables:
  - Universally accessible macros: 12 months

- Impact:
  - Enhanced productivity across devices and applications

vxmlSurfer: VoiceXML Interpreter

TeleWeb
Proposed Work and Deliverables

- Deliverables:
  - Telephony applications: 6 months
  - Voice-enabled applications: 6 months

- Impact:
  - Cost-effective phone answering services
  - Adding speech interfaces to existing applications

Social Accessibility Project

- Collaborative authoring of accessibility metadata
- Social network for end-users and volunteers
  - [http://socialaccessibility.alphaworks.ibm.com/]
- Shortens the time for accessibility renovations
- Supports: headings, ALT tags, and titles

Metadata Lifecycle
Proposed Work and Deliverables

- Deliverables:
  - Resilient addressing of web objects: 6 months
  - Automated creation of metadata: 12 months

- Impact – improving web accessibility for:
  - Crawlers
  - Screen-readers
  - Automation tools
  - Mash-ups

Questions?
Comments?
Concerns?
Suggestions?

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**NSF Industry/University Center for Dynamic Data Analytics (CDDA)**

**Project Summary**

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<th><strong>Project Name:</strong></th>
<th>HearSay Technologies</th>
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<td><strong>Project Investigators:</strong></td>
<td>Dr. I.V. Ramakrishnan and Dr. Yevgen (Eugene) Borodin</td>
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**Description:**

1) While most screen-readers enable people with vision impairments to browse the Web, non-visual Web access remains very slow. In our research on increasing the efficiency of non-visual web browsing, we developed several content analysis techniques for segmentation, relevance identification, and detection of changes. These techniques can be componentized and reused in other applications such as focused crawlers and spiders, tools for data integration, mash-ups, and others.

2) Automation of business processes has been found to significantly improve productivity. Macro recordings are frequently used to replay repetitive tasks. Speech-enabled macros can help screen-reader users improve their productivity while performing browsing tasks online. An abstraction layer between the automation tool and the underlying application can make it easy to reuse the same macros across various applications and devices.

3) VoiceXML is often used to design interactive speech and telephony applications. A VoiceXML interpreter is required to run VoiceXML applications. To fit the needs of the HearSay project we have designed our own VoiceXML interpreter that supports a variety of input and output devices, including VoIP. The resulting technology can be used to create cost-effective phone answering services or add speech interface to existing applications.

4) The Social Accessibility (SA) network started by IBM Research employs the power of the open community to improve web accessibility. Inaccessible web content affects not only blind screen-reader users, but also a variety of applications that strive to automatically crawl, aggregate, and extract information from web pages. The external metadata created in a collaborative effort of end-users and volunteers can make web pages more accessible for all of these applications. We will explore the approaches to making external metadata more resilient and adapt HearSay components for automatic authoring of the metadata.

**Experimental Plan :**
- Extract the necessary technology components from HearSay
- Develop the target application and incorporate HearSay components
- Test the application's performance and accuracy

**Related Work Elsewhere:**
- Inefficient screen-reading technologies
- Platform-dependent automation tools
- VoiceXML interpreters with limited functionalities
- Collaborative projects with different goals than (SA)

**How Ours Is Different:**
- Novel approaches for web content analysis
- Speech-enabled automation tool
- Flexible open-source interpreter
- Live social network for accessibility enhancement

**Milestones:**
- Technology component extraction
- Application development
- Application delivery

**Deliverables:**
- Technical demonstration along with a technical report resulting in a publication.

**Potential Benefits to Member Companies:**
- Tools for improvement of business intelligence
- Enhanced productivity across devices and applications
- Cost-effective phone answering services
- Speech interfaces to existing applications
- Improved accessibility for crawlers, mash-ups, and other tools

**Budget:** $50,000 per project