Accessible IT Research at SBU

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Motivation

- A large population with vision impairments
  - Poor accessibility of web based information
- Many unsolved problems
- Significant social impact
- Potential broader impact
Accessible Web

- Accessibility metadata in web pages
  - Missing
  - Erroneous
  - Manual

- Usable assistive technology tools
  - Expensive
  - Primitive
  - Inefficient
Combining human and machine intelligence to collaboratively generate accessibility metadata
Metadata


Your Amazon.com | Today's Deals | Gifts & Wish Lists | Gift Cards

Search | Electronics | <label for textbox>search</label>

Headphones

Maximo iM-490S iMetal Isolation Earphones
Price: $38.71 Used & new from $27.50 Add to Cart

Philips HL150 Lightweight Stereo Headphones
Price: $9.99 Add to Cart

Koss SPARKPLUG - Stereo In Ear Ear Plugs
Price: $44.00 $12.42 Add to Cart

SanDisk Sansa e260 8GB MP3 Player (Black)
SanDisk $119.99 quantity: 1 subtotal = $119.99
Automate Creation of Metadata?

- Fully-automated approaches to:
  - Segmentation and partitioning
  - Detection of main content
  - Labeling of form fields

- Limitations:
  - Imperfect accuracy
  - Semantics and context
• Social network for end-users and volunteers
  • http://sa.watson.ibm.com/

• Collaborative authoring of accessibility metadata

• Shortens the time for accessibility renovations

• Supports: headings, ALT tags, and titles
Metadata Lifecycle

1. Encounter a problem in a webpage
2. Fix the problem using metadata authoring tools
3. Visually impaired users
   “Yes we can”
4. Sighted Volunteers
   “Yes we can”
5. Enjoy the improved page!
Problems of Crowdsourcing

- Participant recruitment
  - Friends, relatives, random, ...

- Motivation to participate
  - Rewards, implicit, benefits, ...

- Extent of Involvement
  - Training, effort, interference, ...
Hybrid Intelligence

- Use collaborative crawling
- Analyze the behavior of participants
- Provide immediate benefits to the participants
- Require minimal effort and requirements
Progress and Future Work

Progress to date:
- Server infrastructure
- Browser extension
- Developed simple algorithms

Future Work:
- Recruitment of participants (3 months)
- Algorithm design (6 months)
- Evaluation of the approach (12 months)
Outcomes and Applications

- Expected outcomes:
  - A large dataset of usable accessibility metadata
  - Methods for dynamic analysis of user behavior
  - User interfaces for utilizing the metadata

- Applications:
  - Accessibility/usability checking
  - Semantic crawling
  - Information extraction
Non-Visual Skimming

Enabling people with vision impairments to browse the Web with the speed comparable to that of sighted people.
Problems of Screen Reading

- Dependence on metadata
- Shortcut navigation
- Serial audio interface
African elephants, unlike their Asian relatives, are not easily domesticated. They range throughout sub-Saharan Africa and the rain forests of central and West Africa. The continent’s northernmost elephants are found in Mali’s Sahel desert. The small, nomadic herd of Mali elephants migrates in a circular route through the desert in search of water.
Skimming Summary

African elephants, unlike their Asian relatives, are not easily domesticated. They range throughout sub-Saharan Africa and the rain forests of central and West Africa. The continent’s northernmost elephants are found in Mali’s Sahel desert. The small, nomadic herd of Mali elephants migrates in a circular route through the desert in search of water.
Progress and Future Work

Progress to date:
- Created a small dataset of human summaries
- Conducted a study to choose the best summary
- Developed a summarization algorithm
- Evaluated the algorithm in realistic scenarios

Future Work:
- Variable size summaries (3 months)
- Skimming with touch interfaces (6 months)
- Skimming with tactile displays (9 months)
- Skimming of eclectic web content (12 months)
Outcomes and Applications

- Expected outcomes:
  - Methods for semantic and structural analysis of web pages
  - Non-visual interfaces for effective screen-reading

- Applications:
  - Assisted visual skimming
  - NLP toolkits
Questions?
Comments?
Suggestions?

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