

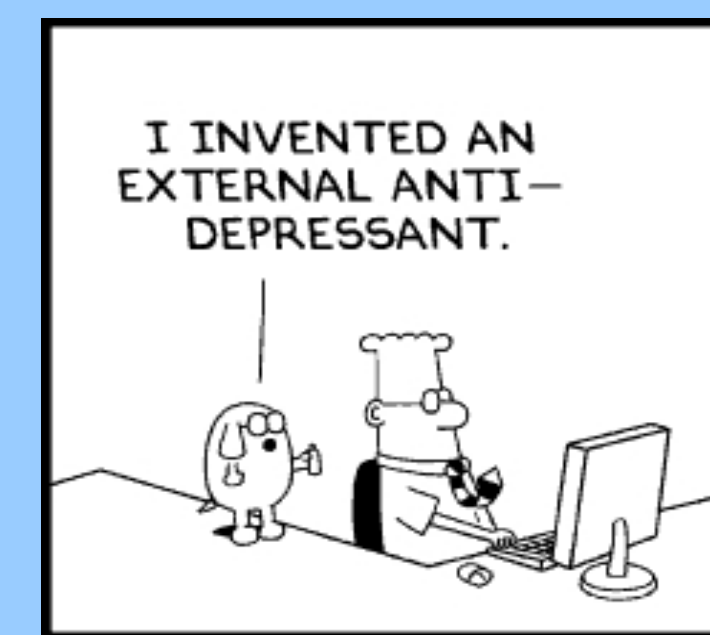
A Feasibility Examination on Creating Accessible Comics

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Significance

- Comics are currently inaccessible to people with severe visual impairment.
- Mixed text and complex graphics.
- Effectiveness of braille, audio, tactile, or a combination thereof in conveying visual information.

Conversion Process



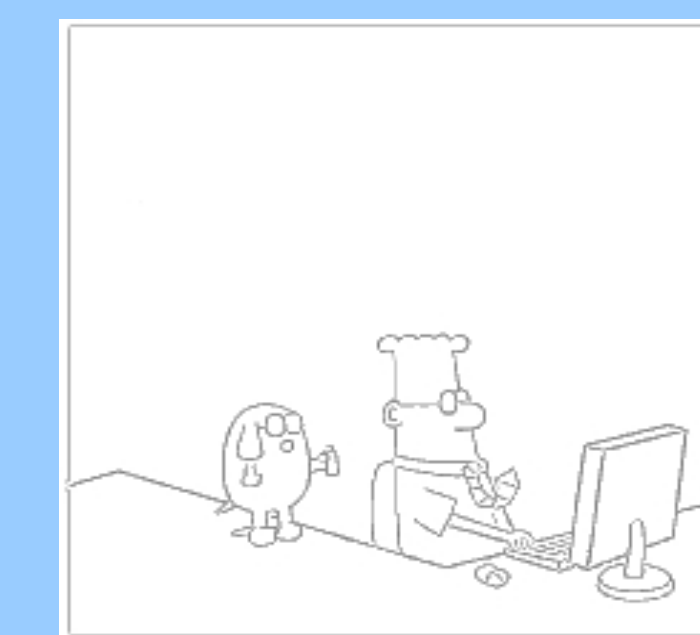
Original



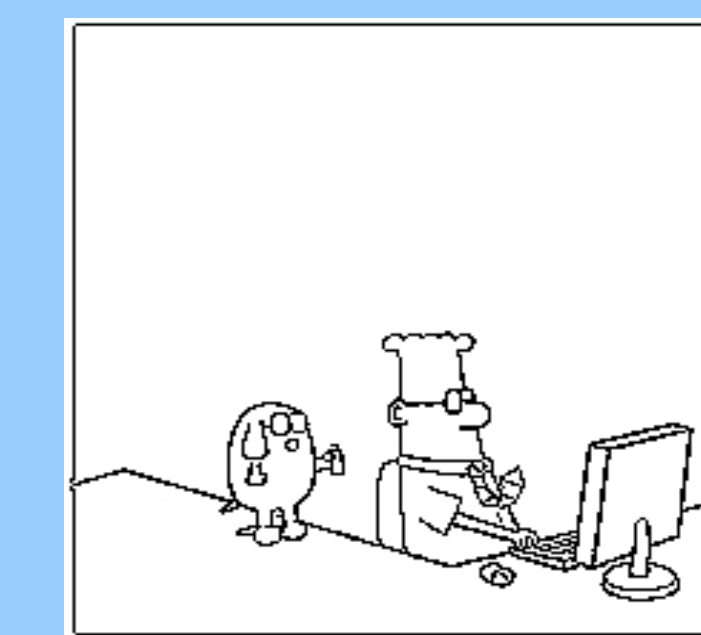
Edge Detection



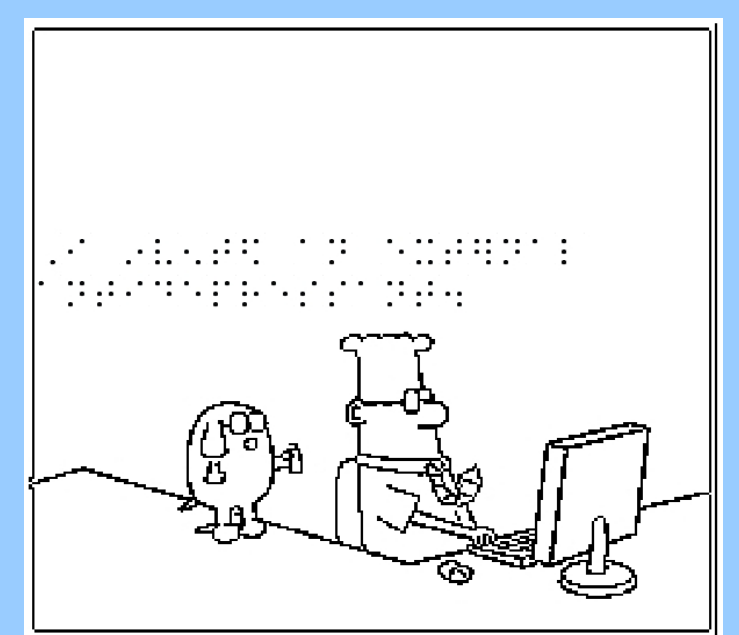
Color Inversion



Text Removal



Black and White
Conversion






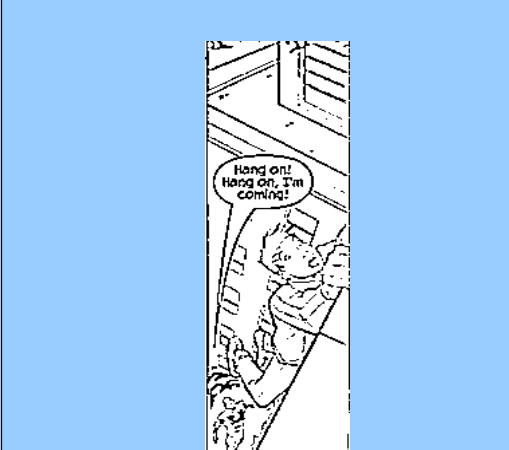
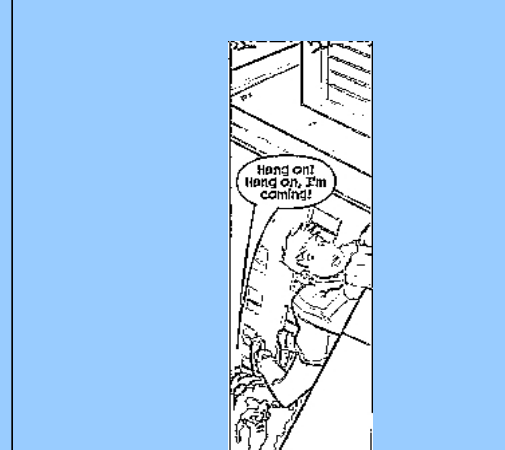







Braille Overlay

Comic extracted from Scott Adams's 14 March 2006 *Dilbert* comic. Available online at: <http://www.dilbert.com/strips/comic/2006-03-14/>

Edge Detection

Literature indicates that contours are more recognizable than full embossing with tactile images.

	Difference of Gaussians	Laplace	Sobel
			
			
			

Comics extracted from:

- (1) Charles M. Shultz's 26 July 2009 *Peanuts* comic.
- (2) *Marvel Age Fantastic Four*, Issue 1. Marvel Comics, February 2009.
- (3) J. Siegel and J. Shuster, "Superman." *Action Comics*, No. 1. Detective Comics, June 1938.

Tactile Modality

- Speech bubbles disjoint from speakers.
- Braille overlaps the background often.
- Background and foreground mingling.
- Details require large scale:
 - Page-sized panels are more efficient in differentiating characters.
 - Requires more exploration and reading time.

Future Work

- Automated conversion of complex images.
- Development of software for:
 - Hand-written text optical character recognition.
 - Tactile complex graphics.
 - Tactile-braille graphics from image-print graphics.
- Test alternative modalities for the effectiveness in mixed text-graphics accessibilities.

Auditory Modality

- Increased reading speed.
- Less detail needed in tactile modality.
- Summary needed for what auditory information is available.
- Layers of information:
 - Allows external information ("X speaks").
 - Excessive information makes search difficult.

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