



Accessibility Ignites Innovation

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Information accessibility



Mobility



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Home Page Reader

- ■The first practical voice browsers in the world
- ■Became a product in 1997 and translated into 11 languages

"Home Page Reader is my small window to the world.

I can read, write, and access information. I can do everything to participate in society."

— comment from a user, 1997



IBM Home Page Reader (1999)
Japanese, Italian, French, German, Spanish, English (U.S., U.K.)

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The Second Challenge: Real World Accessibility



Walk by myself



Shopping



Finding restaurants



Finding discount signs

\$\times \text{\Quad}\text{\Qua



Cognitive Assistant



Augment missing or weakened abilities by the power of cognitive computing.

CMU Cognitive Assistant Lab. Members

Advisors



Martial Hebert **Robotics Institute** Director



Takeo Kanade Former director

Faculty members



Kris Kitani Robotics Institute



Jeff Bigham **Human Computer Interaction** Institute

Postdocs



Hernisa Kacorri



Dragan Ahmetrovic



Master

Eshed Ohn-Bar



João Guerreiro



Uran Oh

PhD **Students**



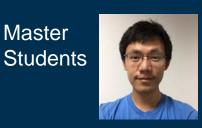
Anhong



Cole



Nick



Chengxiong



Rajat



TED
2015
Chieko Asakawa
How new technology helps blind people explore the world

https://www.ted.com/talks/chieko_asakawa_how_new_technology_helps_blind_people_explore_the_world



Nihonbashi COREDO Muromachi Pilot



Source: MITSUI FUDOSAN (http://www.mitsuifudosan.co.jp)







Source: Mitsui Shopping Park Urban (https://31urban.jp/)

- February 1st February 28th, 2017.
- Conversational destination search + Accurate indoor navigation
- Blind, wheelchair and foreign visitors
- 21,000m² (Three buildings x five floors)
- 92 shops and restaurants



IBM Research – Blog February 2017 Hironobu Takagi Realizing a barrier-free society

https://www.ibm.com/blogs/research/2017/02/realizing-a-barrier-free-society/

https://www.youtube.com/watch?v=mlGcutE2t2A&t=1s



Foundation of Cognitive Assistant



Knowledge

Personal profile

Maps

Social media, Encyclopedic



Recognition

Objects
People
Environment



Localization

Radio-wave Vision Accelerometer



Speech Gesture Sonification





Innovations Flourish From Accessibility Needs

Captions for TV programs were invented for deaf people, but are now widely used in sports bars and to help immigrants, etc.

2011, Voice dialogue technologies for smartphones

Autonomic vehicles

First consumer product was a reading assistant for the blind

Early use of keyboards was

hand-and-motor disabilities

a to help people with

in the 1970s.

TV Captions

Voice 20th synthesis and OCR

Keyboard Telephone Voice dialog "Blind driving challenges"

Segway

Voice recognition Based on Self-standing wheelchair.

1876, Alexander Graham Bell invented the phone after teaching hearing impaired people.

Modern Mathematics

17th century, Dom Perignon

in writing



champagne



18th century, the mathematician Euler authored a leading textbook on mathematics after he became blind.

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IBM History of Accessibility

1914 First IBMer with disabilities

1960s Talking Typewriter

1975 1403 Braille Printer

1984 Talking 3270 Terminal

1988 ScreenReader/DOS

1990 VoiceType™

1997 Home Page Reader

1998 ViaVoice®

2004 aDesigner

2008 Social Accessibility

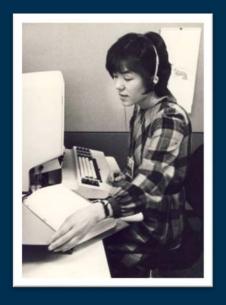
2011 Senior Workforce Project

2012 Brazil Accessible Vocational Training Project



1960s
Talking Typewriter

1984 Talking 3270 Terminal





Medici Effect

"By breaking down associative barriers and stepping into the intersection between fields, the number of available idea combinations increases beyond anything we can achieve in a single area. This explains why diverse teams can be more creative than homogeneous groups."

From Frans Johansson, "The Medici Effect"



Make your own perspective your advantage.

Make impossible possible by never giving up.