



# Accessibility Ignites Innovation

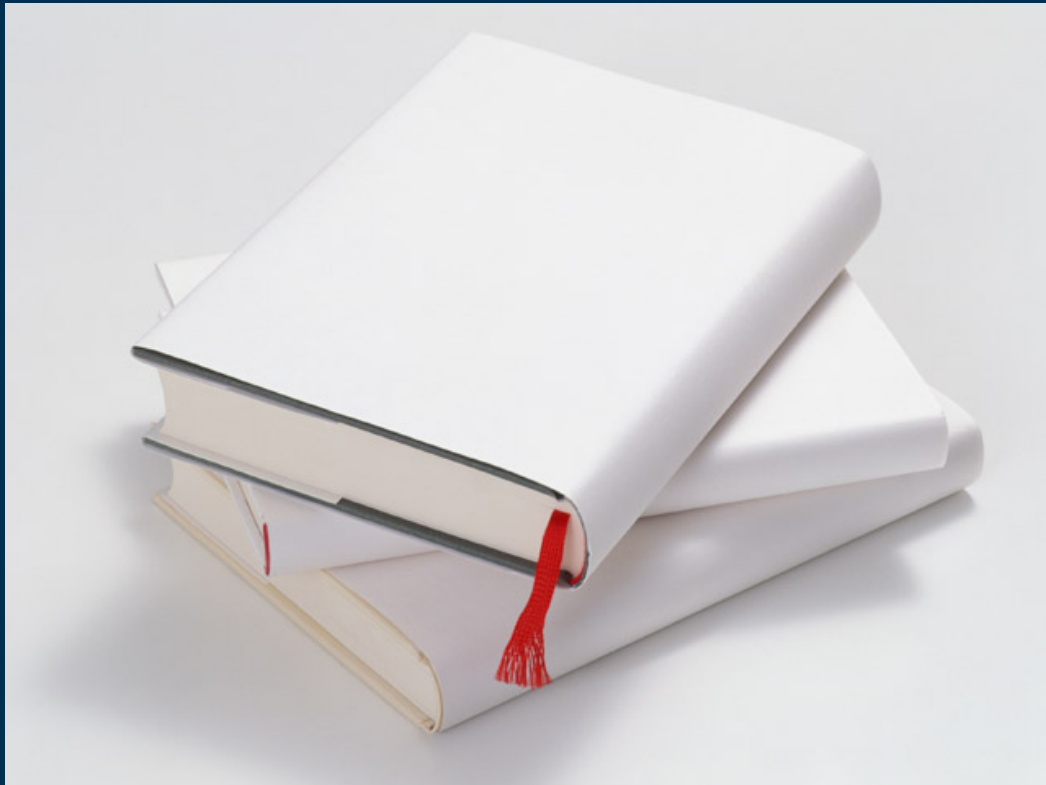
Chieko Asakawa

IBM Fellow, IBM Research

IBM Distinguished Service Professor,

Carnegie Mellon University

## Information accessibility



## Mobility



# 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.)

# The Second Challenge: Real World Accessibility



Walk by myself



Shopping



Finding restaurants



Finding discount signs

# 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  
Ahmetovic



Eshed  
Ohn-Bar



João  
Guerreiro



Uran  
Oh

## PhD Students



Anhong

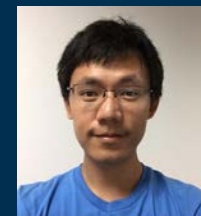


Cole



Nick

## Master Students



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](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 1<sup>st</sup> - February 28<sup>th</sup>, 2017.
- Conversational destination search + Accurate indoor navigation
- Blind, wheelchair and foreign visitors
- 21,000m<sup>2</sup> (Three buildings x five floors)
- 92 shops and restaurants



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

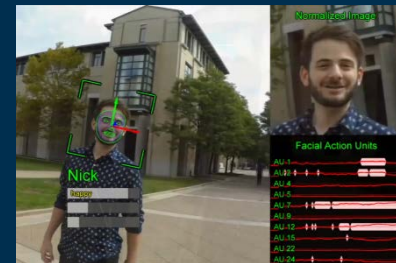
[https://www.ibm.com/blogs/research/2017/02/  
realizing-a-barrier-free-society/](https://www.ibm.com/blogs/research/2017/02/realizing-a-barrier-free-society/)

<https://www.youtube.com/watch?v=mIGcutE2t2A&t=1s>

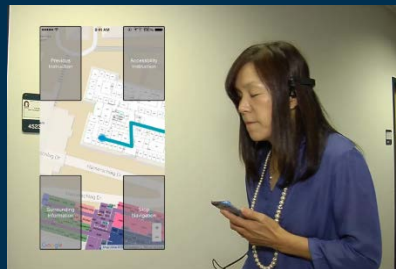
# Foundation of Cognitive Assistant



**Knowledge**  
 Personal profile  
 Maps  
 Social media, Encyclopedic



**Recognition**  
 Objects  
 People  
 Environment

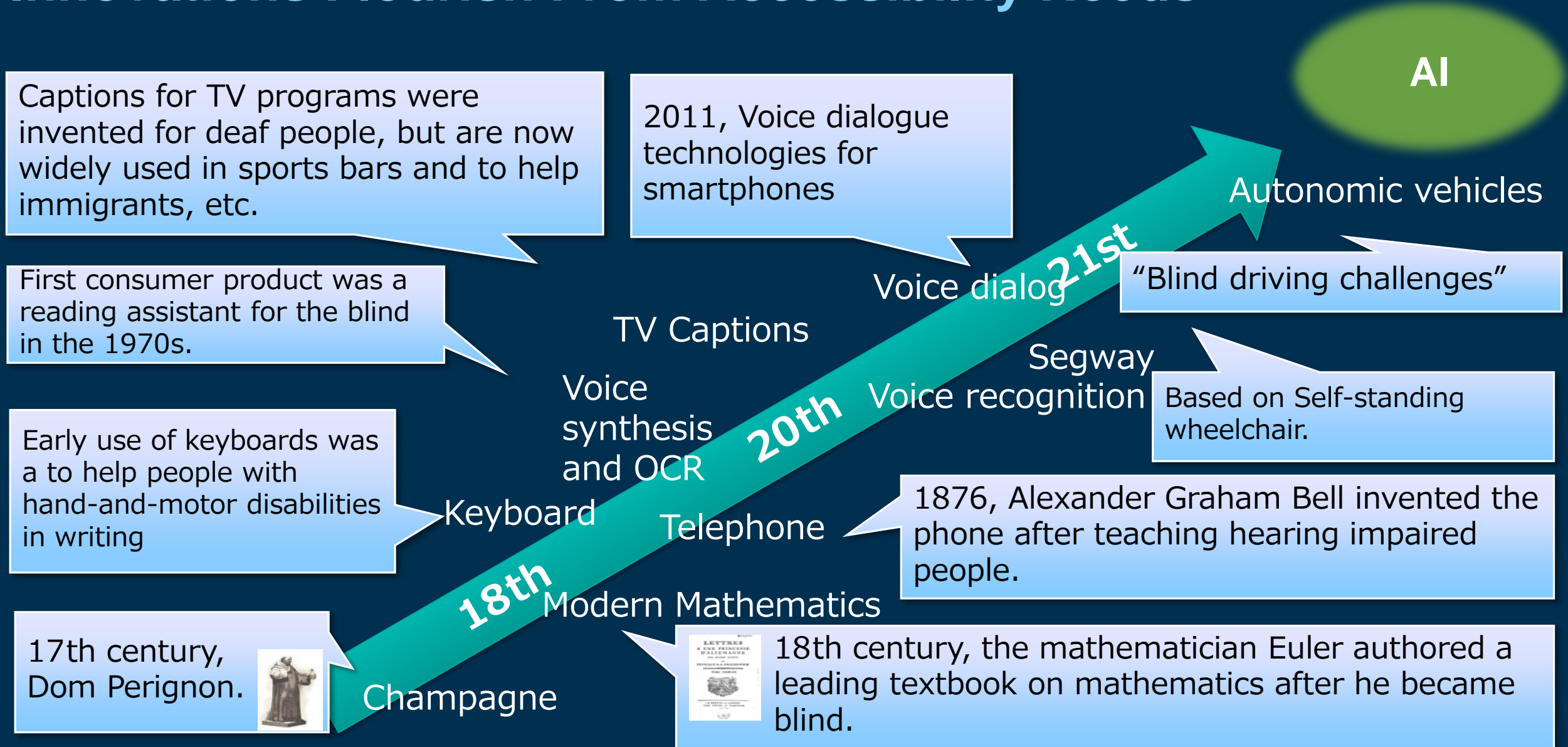


**Localization**  
 Radio-wave  
 Vision  
 Accelerometer

**Interaction**  
 Speech  
 Gesture  
 Sonification



# Innovations Flourish From Accessibility Needs



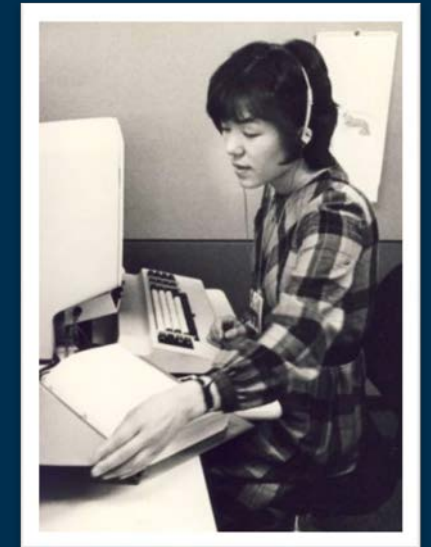
# IBM History of Accessibility

- 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.*