

"Open the digital library doors, HAL." Voice User Interface (VUI) & Conversational Onboarding Patterns for Digital Collections

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Digital Library Federation Forum
Pittsburgh, PA
2017-10-24

twitter as channel (#hashtag)

@jaclark #DLFforum

Overview

- How people talk with computers?
- Common patterns of VUI models
- Case Study of Prototype
- Implications for Digital Libraries
- Research - Next Steps
- Questions

HAL 9000



```

=====
EEEEEEEE L      IIIIII  ZZZZZZZ  AAA
E        L      I        Z        A  A
E        L      I        Z        A  A
EEEEEE   L      I        Z        A  A
E        L      I        Z        AAAAAA
E        L      I        Z        A  A
EEEEEEEE LLLLLLL IIIIII  ZZZZZZ  A  A
=====

```

```

=====
ELIZA > (PLEASE TYPE IN ALL CAPS) WHAT'S YOUR NAME DEAR ?
AMIT
ELIZA > HI, I'M ELIZA. WHAT DO YOU WANT TO TALK ABOUT ?
AMIT > CAN I TALK ABOUT MY PROBLEM ?
ELIZA > SURE... !
AMIT > DUE TO ON GOING EXAMS IN COLLEGE, I HAVE A LOT OF STRESS.
ELIZA > PLEASE RELAX A LITTLE. SLEEP WELL.
AMIT > THANKS FOR YOUR ADVICE.
ELIZA > NO MENTION.
AMIT > BYE
ELIZA > BYE AND KEEP IN TOUCH...
=====

```

An Aspirational Model for AI
+
Human to Computer Interaction

A desire to converse naturally
with a machine

“1 in 5 online adults have used voice search on their mobile in the last month.”

Source: [Global Web Index](#)



Siri

Speech Interpretation and Recognition Interface



What are current Voice User Interactions (VUI) models?

Chatbots

Intelligent Personal Assistants

Case Study: Talking to a Digital Collection

James Willard Schultz Photographs and Personal Papers Collection

[Quick Search](#)
[Advanced Search](#)
Search:

➤ Browse the Digital Collection

[Topics](#)
[Keywords](#)
[Titles](#)
[Dates](#)
[Object Number IDs](#)

➤ About

➤ [James Willard Schultz Photos & Personal Papers Collection](#) includes photos & documents of Blackfeet, Blood, Kootenai, Shoshone and Arapaho Native Americans, Glacier and Waterton Lakes National Parks, as well as his professional writing career and personal papers.

➤ Search Tips

Quick Search will search: title, abstract, and keyword fields for the search term.

Advanced Search gives the option of searching individually by: keywords and/or title fields.

➤ [Help Searching the Schultz Digital Collection](#)

📖 Digital Photograph and Paper Samples



[James Willard Schultz with General Hugh Scott and Friends](#)

Keyword(s): james willard schultz, general hugh scott, people



[Description of Otter Painted Lodge Ceremony and Buffalo Stone Ceremony](#)

Keyword(s): isabelle home gun, otter painted lodge, browning, singers



[Black and white photo of a group of men in ceremonial dress raising the American flag, Saint Mary's, Montana](#)

Keyword(s): clothing and dress, tipis, indians of north america, blackfeet indians, flagpoles,

A digital collection built for:

discovery

+

agency

TalkingCollection

[Activate](#)

- ▶ Prompt me by touching the blue button between questions. Get list of supported commands by clicking arrow.

Hello! I'm your voice assistant. Ask me what I can do or speak a command.

search please

Ok! Let's go to the search page.

TalkingCollection

Search

St Mary's Lake



 James Willard Schultz Photographs and Personal Papers Collection - Montana State University (MSU) Library

Your search for **St Mary's Lake** resulted in **73** records.

[+ Back to Home page](#)

[+ View next 15 results](#)

Title: [Black and white photo of a boat on Saint Mary's Lake, Glacier National Park, Montana](#)

Date: 1859-1947

Creator: Haynes, St. Paul

Description: Photo of a boat on a mountain lake and a building is visible on the hill top. Written on verso: Going to the Sun Mt. and Chalet, Saint Mary's Lake.

Object ID: 217

Keywords: boats, glacier national park, mountains, lakes, scenic views, montana

[+ View additional details about Black and white photo of a boat on Saint Mary's Lake, Glacier National Park, Montana](#)

Title: [A 6 page document written by Frank Monroe describing trading between white men and Indian tribes.](#)

Date: 1859-1947

Creator: James W. Schultz

Description: This story describes the trading between the white man and the Indian tribes. For example, how animals were trapped, hunted, and traded for resources ...

Object ID: 0010-B05-F23-4

Keywords: st. mary lake, grovoon indian, frank monroe

[+ View additional details about A 6 page document written by Frank Monroe describing trading between white men and Indian tribes.](#)

Title: [Black and white photo of Upper Saint Mary's Lake, Glacier National Park](#)

Date: 1859-1947

Creator: Hileman, T. J.

Description: Photo of a boat with three fishermen on a lake with mountains in the background. Written on verso: Upper Saint Mary's Lake

Object ID: 235

Keywords: glacier national park, mountains, lakes, boats, fishermen, scenic views, montana

[+ View additional details about Black and white photo of Upper Saint Mary's Lake, Glacier National Park](#)

Implications for Digital Libraries

Design

Informational Units, Not Pages



Kangaroo Valley Safari

Located two hours south of Sydney in the
Southern Highlands of New South Wales, ...

SHARE

EXPLORE

Cards

<https://material.io/guidelines/components/cards.html#>

Voice interfaces = short, direct,
expository

TalkingCollection

[Activate](#)

- ▶ Touch or click to get list of supported commands:

Hello! I'm your voice assistant. Ask me what I can do.

what can you do

I can do things for you. Like, help you search or browse the collection; or tell you more about the collection. So, how may I help?

Room for Personality

TalkingCollection

Activate

- ▶ Touch or click to get list of supported commands:

Hello! I'm your voice assistant. Ask me what I can do.

what's the meaning of life

The answer to the ultimate question of life, the universe and everything is 42.

Software Architectures

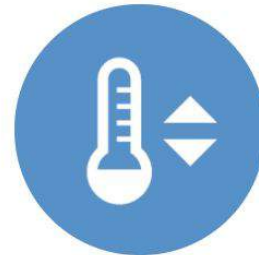
Natural Language for Developers



Bots



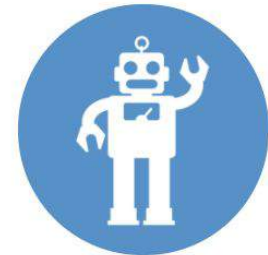
Mobile apps



Home automation



Wearable devices



Robots

Easily create text or voice based bots that humans can chat with on their preferred messaging platform.

Natural Language Processing Software Libraries
https://en.wikipedia.org/wiki/Natural_language_processing

Data Models



Kangaroo Valley Safari

Located two hours south of Sydney in the
Southern Highlands of New South Wales, ...

SHARE

EXPLORE

Cards

<https://material.io/guidelines/components/cards.html#>

```
34  "@type": "schema:CreativeWork",
35  "schema:additionalType": [
36    {
37      "@id": "http://dbpedia.org/page/James_Willard_Schultz"
38    },
39    {
40      "@id": "https://en.wikipedia.org/wiki/James_Willard_Schultz"
41    }
42  ],
43  "schema:author": {
44    "@language": "en",
45    "@value": "Mary Peterson"
46  },
47  "schema:creator": {
48    "@language": "en",
49    "@value": "Mary Peterson"
50  },
51  "schema:dateCreated": {
52    "@language": "en",
53    "@value": "1946-12-26"
54  },
55  "schema:description": {
56    "@language": "en",
57    "@value": "A letter written from Mary Peterson, the History Department Librarian at the Los Angeles Public Library, to Mr. James Willard Schultz explaining when California was seized by the United States from Mexico. "
58  },
59  "schema:keywords": {
60    "@language": "en",
61    "@value": "james willard schultz, letter"
62  },
63  "schema:name": {
64    "@language": "en",
```

Structured Data
<https://json-ld.org/>

Conversational Onboarding Patterns

Task-based...

Directive-based...

Branch: master ▾

[voice-user-interface](#) / [meta](#) / [assets](#) / **bot-script.md**



jasonclark added make class booklist as option

1 contributor

105 lines (52 sloc) | 1.83 KB

(searchLibrary)

| U: HeyLibrary, search the library.

| A: Ok, I can do that. Tell me your search query.

| U: *user speaks query*

| A: Got it. Running that search for you.

(browseLibrary)

| U: HeyLibrary, can you let me browse the library.

| A: Yes, but I need to know what topic you want to browse.

| U: *user speaks topic*

| A: Hmm... Let's see what we can find.

Scripting the conversation

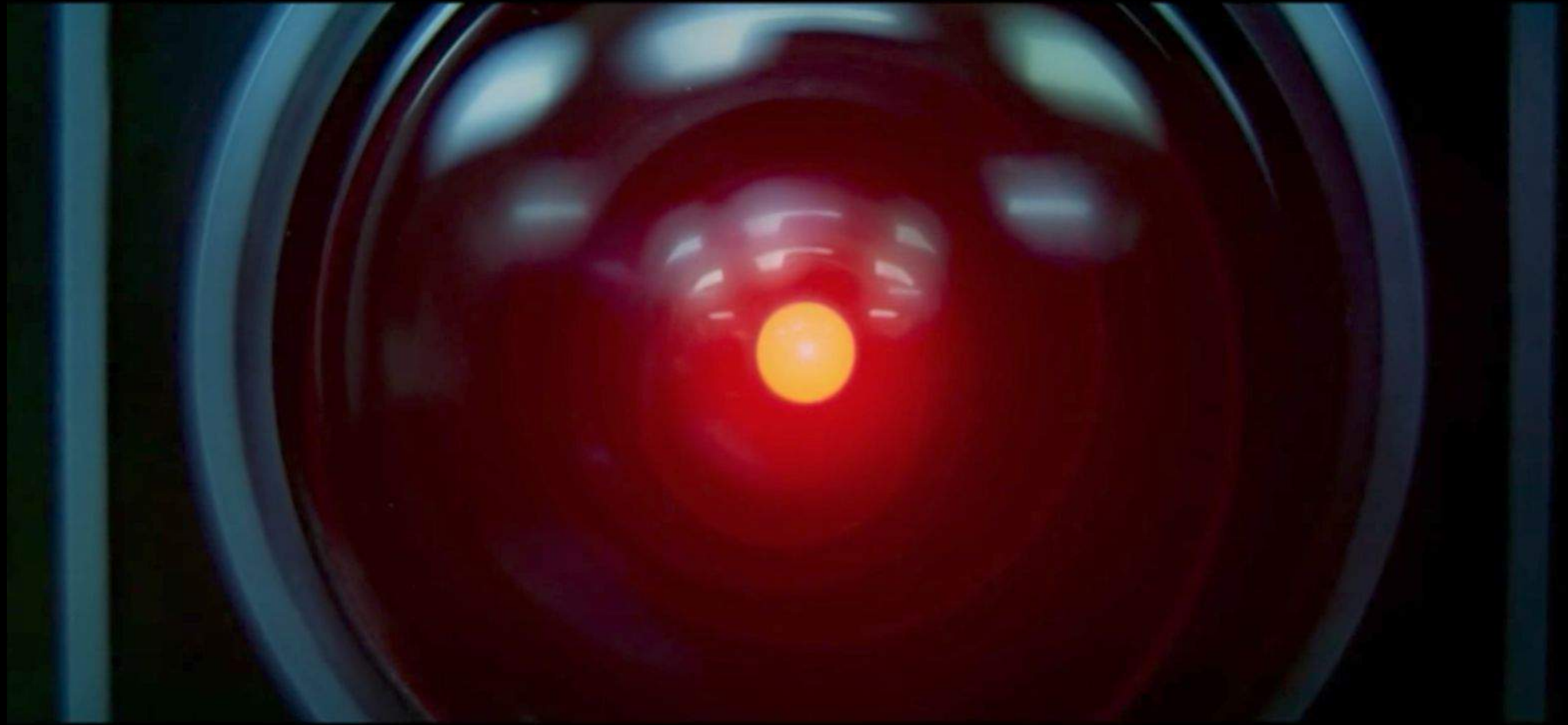
Research - Next Steps

- User Testing - What do you want to ask the Library?
- Improve interpretation with Natural Language processing software library
- Applying structured data as the search index for precision in recall

New affordances in the web environment enable conversation

https://developer.mozilla.org/en-US/docs/Web/API/Web_Speech_API

What will libraries do with these
new affordances?



~~"I'm sorry~~ **Dave, I'm afraid I can't do that."**

<https://youtu.be/ARJ8cAGm6JE?t=1m10s>

Acknowledgements

I would like to thank Montana State University and my excellent colleagues at MSU Library for supporting my research.

And especially Suvethan Vignarajah (Suvi) who built an early sketch of this voice assistant idea.

I am distributing this work under the Attribution-Noncommercial-Share Alike 3.0 Unported license.

Demo

This is a rough prototype!

But, it allows us to see and test VUI experience.

<https://www.lib.montana.edu/~jason/files/talking-collection/>

Code

Voice interface

Bot planning script

<https://github.com/jasonclark/voice-user-interface>

Questions?

@jaclark

www.jasonclark.info

