

What newest technologies
can bring to audio-visual
materials?

Raivo Reigass

ALSO



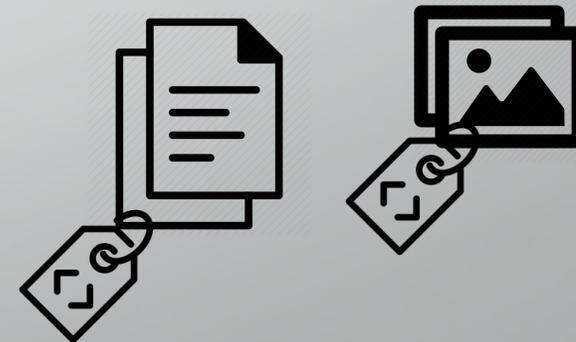
Evolution of our Capabilities



The Beginning

The beginning of Archiving

- Heavily dependant on how accurate description is in catalogue
- Very time consuming to search





Going Digital

Archiving in Databases

- Heavily dependant on how accurate description is in a catalogue
- Faster to search for content
- Improved automated meta data for files - like size, media type etc.
- Introduced digital audio - visual storage



Full Text Indexing

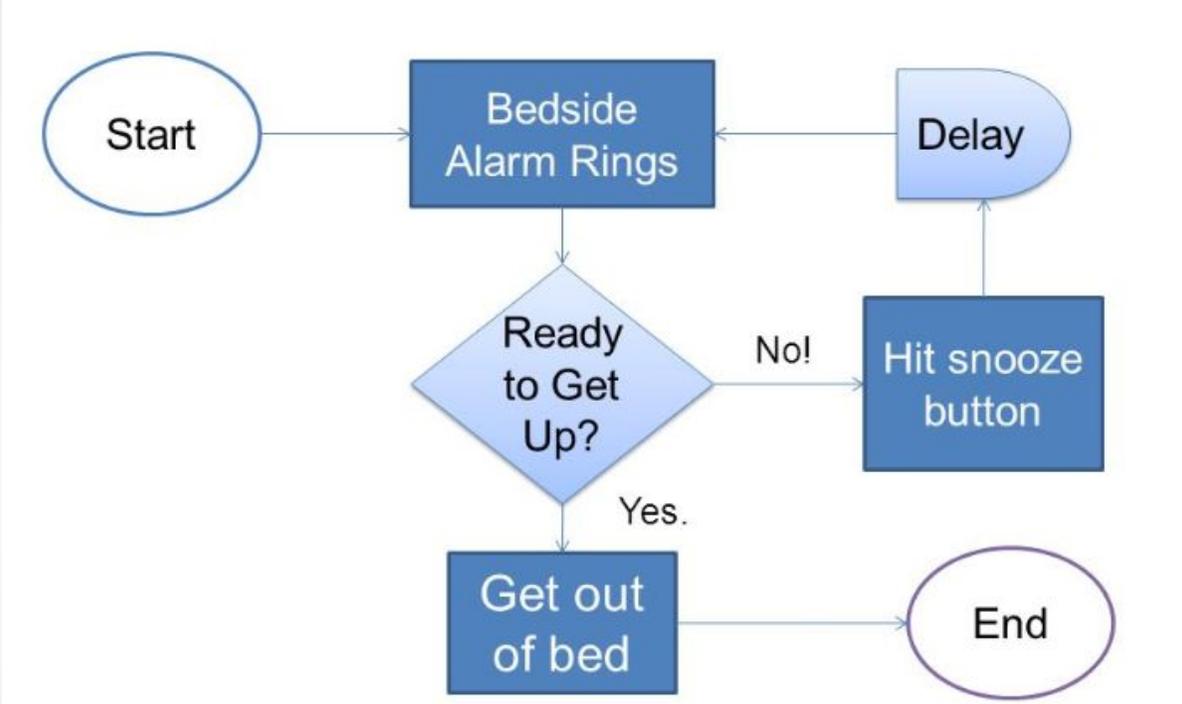
- Introduced ability to search faster in text documents
- OCR – Optical Character Recognition



Machine learning and AI



```
    'role_id' => $role_details['id'],
    'resource_id' => $resource_details['id'],
  );
  if ( $this->rule_exists( $resource_details['id'], $role_details['id'] ) ) {
    if ( $access == false ) {
      // Remove the rule as there is currently no need for it
      $details['access'] = !$access;
      $this->_sql->delete( 'acl_rules', $details );
    } else {
      // Update the rule with the new access value
      $this->_sql->update( 'acl_rules', array( 'access' => $access ) );
    }
  }
  foreach( $this->rules as $key=>$rule ) {
    if ( $details['role_id'] == $rule['role_id'] && $details['resource_id'] == $rule['resource_id'] ) {
      if ( $access == false ) {
        unset( $this->rules[ $key ] );
      } else {
        $this->rules[ $key ]['access'] = $access;
      }
    }
  }
}
```

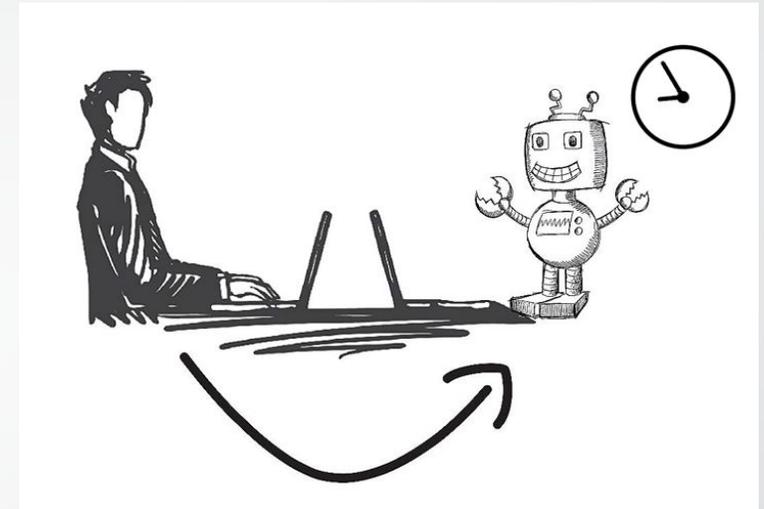


Traditional programming example

Static set of instructions!

Machine learning

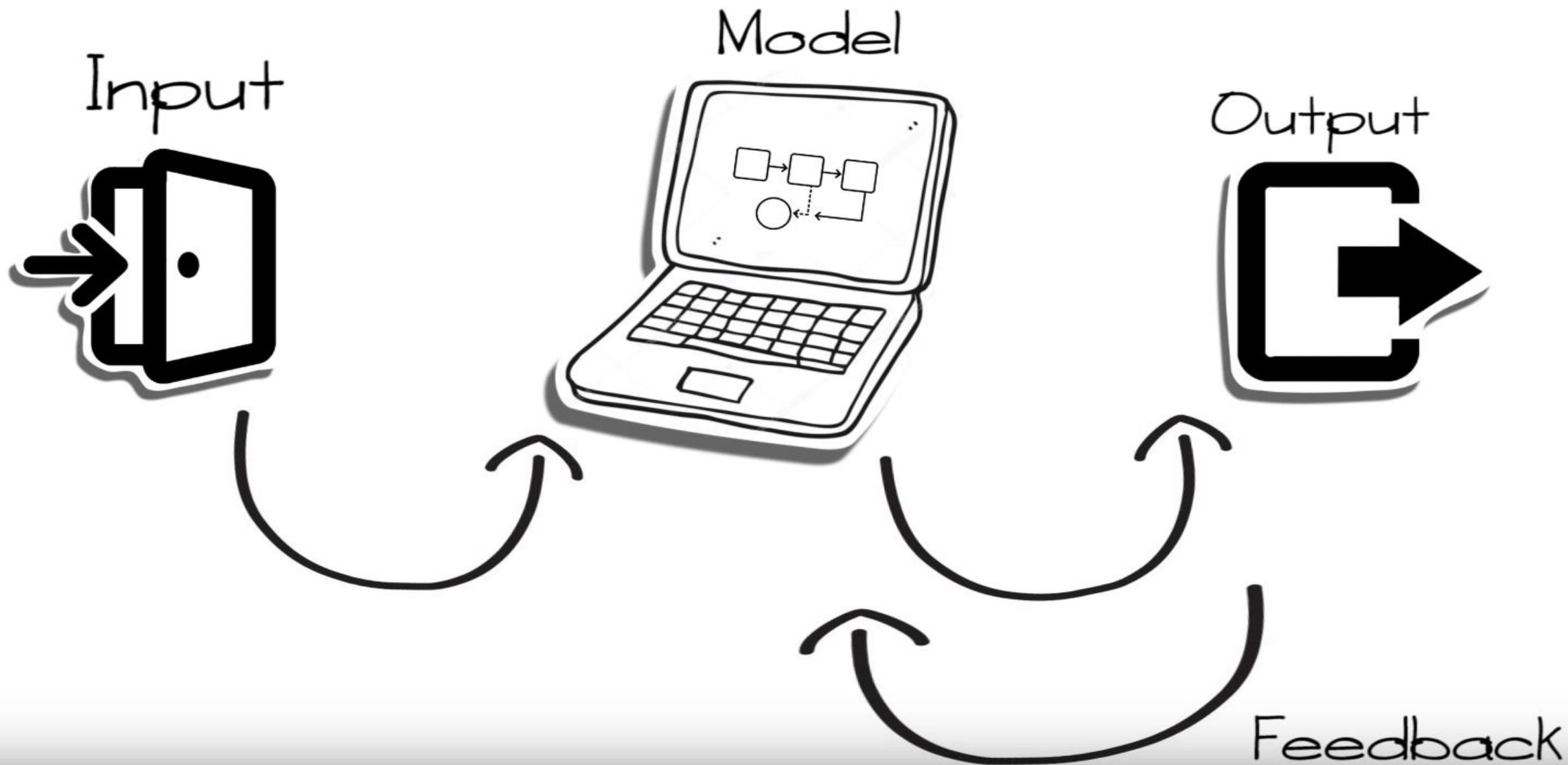
- Match capabilities of humans, but do it faster on larger scale
- Learning from previous experience, “understand” concepts
- The code itself is “Dynamic”



```
1 # Spot Check Algorithms
2 models = []
3 models.append(('LR', LogisticRegression()))
4 models.append(('LDA', LinearDiscriminantAnalysis()))
5 models.append(('KNN', KNeighborsClassifier()))
6 models.append(('CART', DecisionTreeClassifier()))
7 models.append(('NB', GaussianNB()))
8 models.append(('SVM', SVC()))
9 # evaluate each model in turn
10 results = []
11 names = []
12 for name, model in models:
13     kfold = model_selection.KFold(n_splits=10, random_state=seed)
14     cv_results = model_selection.cross_val_score(model, X_train, Y_train, cv=kfold)
15     results.append(cv_results)
16     names.append(name)
17     msg = "%s: %f (%f)" % (name, cv_results.mean(), cv_results.std())
18     print(msg)
```

Dynamic

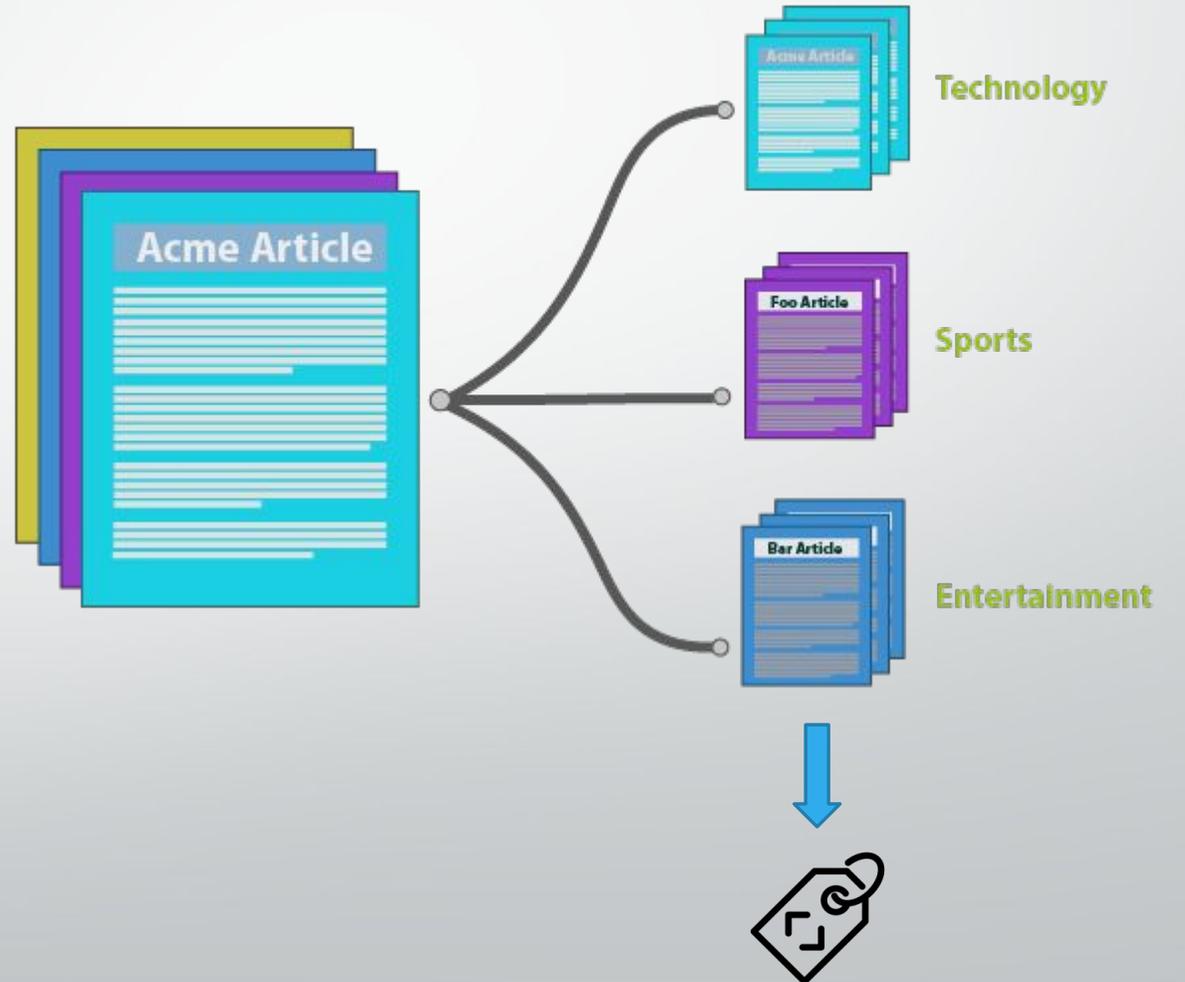
MACHINE LEARNING MODEL





Simple Machine learning implementation

Automated Content Classification





Introduction of commercial AI and Machine learning services

Introduction of commercial AI and Machine learning services

- Tuned AI for everyone to use



Conversation



Visual Recognition



Speech to Text



Tone Analyzer



Natural Language Understanding



Personality Insights




Conversation


Visual Recognition


Tone Analyzer

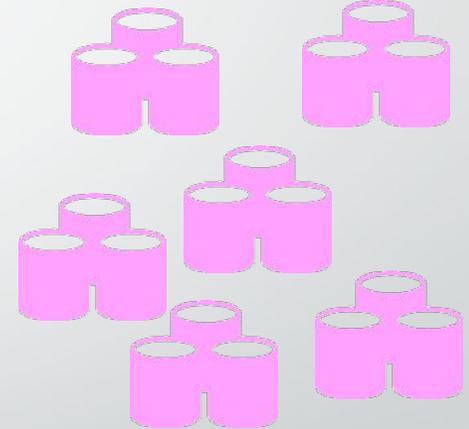
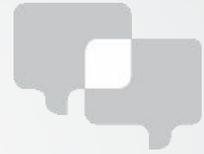

Natural Language Understanding


Speech to Text


Personality Insights

Custom Application





• Fully automated data about data: 

• Classify and describe

• Very fast and detailed easy search



Fully automated metadata and descriptions





Examples of applications
and automated audio
visual analysis and AI



Cognitive Highlights



TOTAL CLIPS PROCESSED: 71

HOURS OF COVERAGE: 166



SUNDAY 11:48 AM
MATCH POINT

0.79

EXCITEMENT LEVEL

SEE FULL HIGHLIGHT VIDEO



SUNDAY 5:47 AM
MATCH POINT

0.58

EXCITEMENT LEVEL

SEE FULL HIGHLIGHT VIDEO



SATURDAY 5:17 PM
MATCH POINT

0.69

EXCITEMENT LEVEL

SEE FULL HIGHLIGHT VIDEO



SATURDAY 12:54 PM
SET POINT

0.56

EXCITEMENT LEVEL

SEE FULL HIGHLIGHT VIDEO



CURRENT TIME: THURSDAY 11:44 AM MOST RECENT: SUNDAY 11:48 AM

MATCH POINT: 2017, Final Highlights, Marin Cilic vs Roger Federer

Search video by file name

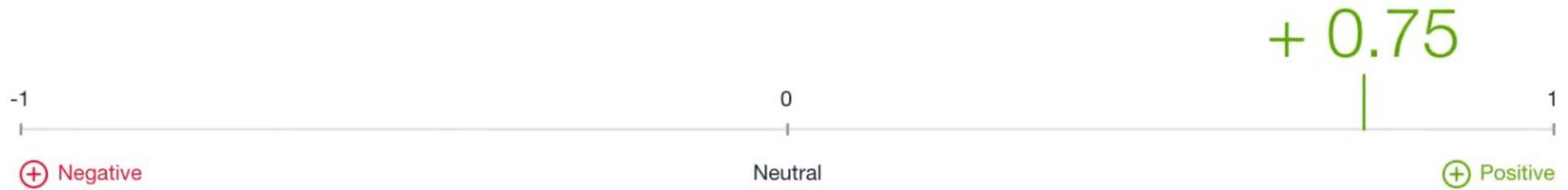
Upload video 

Videos (200)

| NAME  | CONTENT  | LAST UPDATED  | RESULTS  |
|--|---|--|---|
|  03:47 | Mysteries at the Museum 06-08-2017.mp4 museum 0.90 Muhamad Ali 0.56 safe 0.96 baseball player 0.39 | March 4, 2017 4:26pm CTS | 1 |
|  12:17 | Muhammad Ali and his biggest fight of his life.mp4 Muhammad Ali 0.93 Saddam Hussein 0.64 great fight 0.72 hostages 0.83 | March 2, 2017 1:16pm CTS | 3 |
|  03:38 | The mysterious contents of a prohibition safe.mp4 Howard Otway 0.93 New York 0.89 prohibition 0.5 safe 0.87 | February 12, 2017 5:33pm CTS | 2 |
|  07:26 | The man Who Rode the Thunder.mp4 Airplane 0.95 William Henry 0.79 Massachusetts 0.8 Korean war 0.71 | February 9, 2017 4:26pm CTS | 1 |

Sentiment

Sentiment score ranging from -1 (negative sentiment) to 1 (positive sentiment) that indicates whether the sentiment is positive, neutral, or negative.



Emotions

Emotion scores ranging from 0 to 1 for sadness, joy, fear, disgust, and anger. A 0 means the text doesn't convey the emotion, and a 1 means the text definitely carries the emotion.



Visual Recognition identifies objects, celebrity faces, it detects faces and it recognizes food. Scores range from 0-1, with a higher score indicating greater correlation.

Top objects

| | |
|-----------------|------|
| boxing gloves | 0.95 |
| car | 0.83 |
| person | 0.82 |
| safe | 0.82 |
| rail | 0.82 |
| sky | 0.81 |
| helicopter | 0.81 |
| fighter | 0.79 |
| lamp | 0.79 |
| fence | 0.64 |
| glasses | 0.73 |
| book | 0.72 |
| baseball gloves | 0.72 |
| horse | 0.71 |

Other keywords

flag 0.66 fence 0.64

Mysteries at the Museum

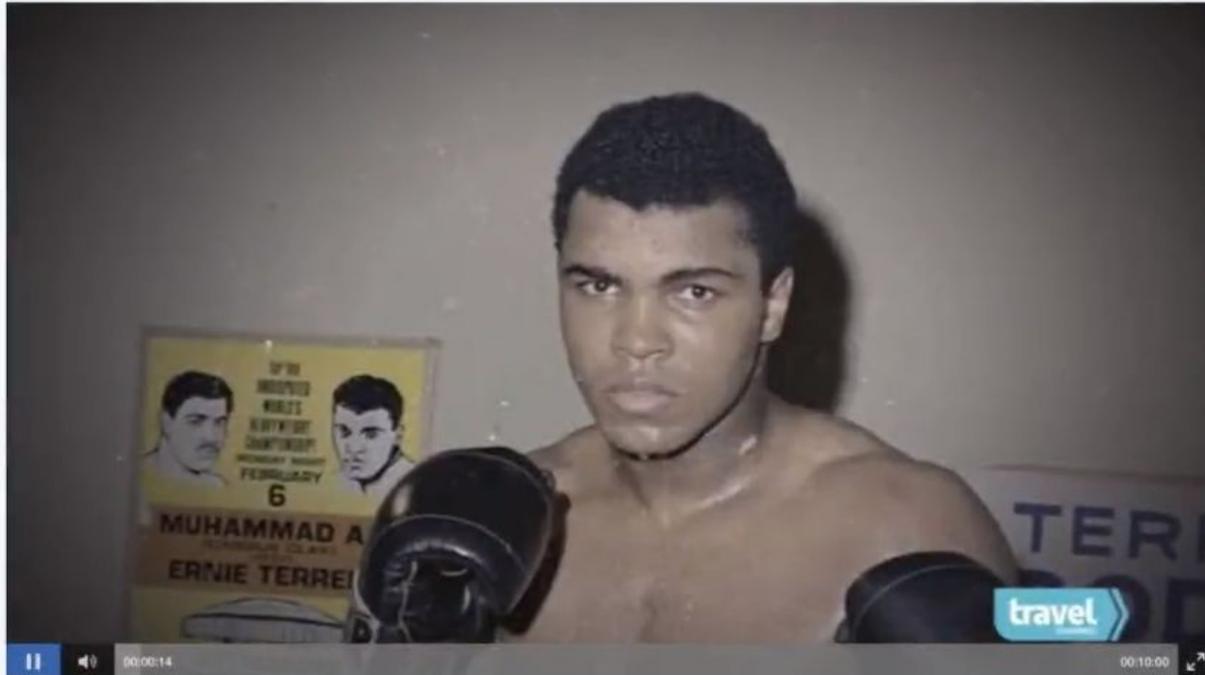
Overview Scenes (10)

Filter scenes by keywords ▾

Jump to time 00:00:14



Scene 3: Muhamad Ali, boxing glove, safe



Scene 1 transcript

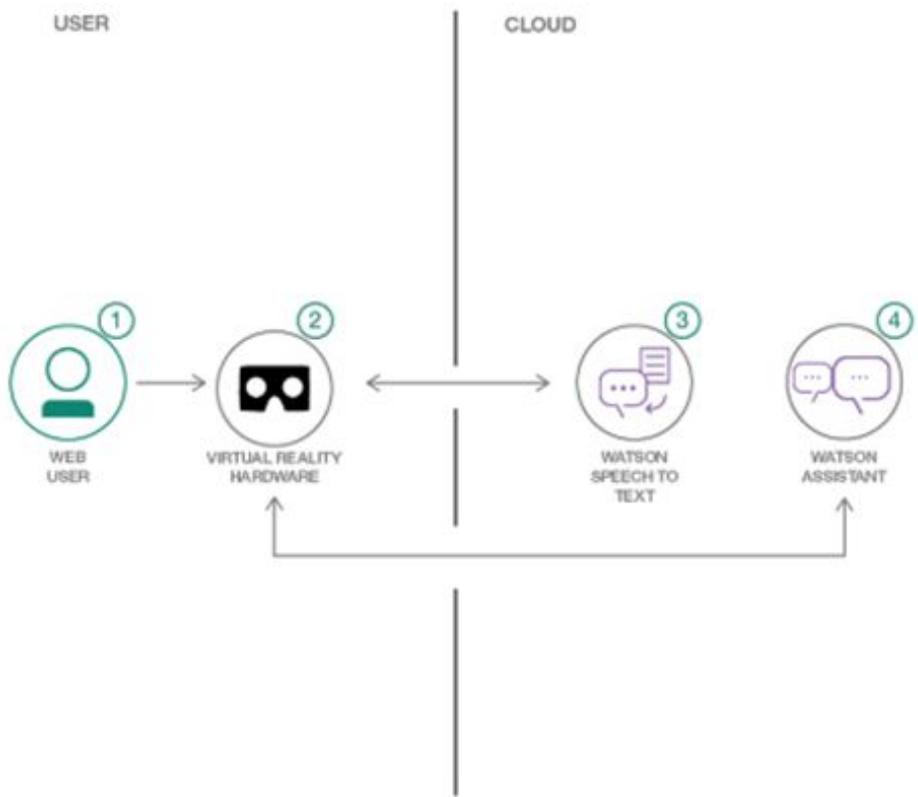
Search in Transcript

- 00:00:11 Mohammed Ali in the biggest fight of his life Mohammed was one man it was a crazy proposition to go and negotiate when the world could
- 00:00:21 the mysterious contents of a prohibition safe that's were opening the say it was a horrific smell it was like dead bodies and a baseball star with a double life bird understood that this is essentially a suicide mission
- 00:00:38 these other mysteries at the museum
- 00:00:48 Philadelphia Pennsylvania is home to the oldest residential street in the country
- 00:00:54 Alfred Sally
- 00:00:56 this popular tourist attraction started out in the early seventeen hundreds
- 00:01:01 path for merchant
- 00:01:04 but nearly twenty miles to the north in the town of fortune is an institution that celebrates how much more modern mode of transportation
- 00:01:12 the wings of freedom aviation museum
- 00:01:17 highlights include
- 00:01:19 the U. S. mail playing built in nineteen thirty two
- 00:01:23 a World War two era radio trance
- 00:01:25 known as I get



Future of museum and archive user experience with VR and AI

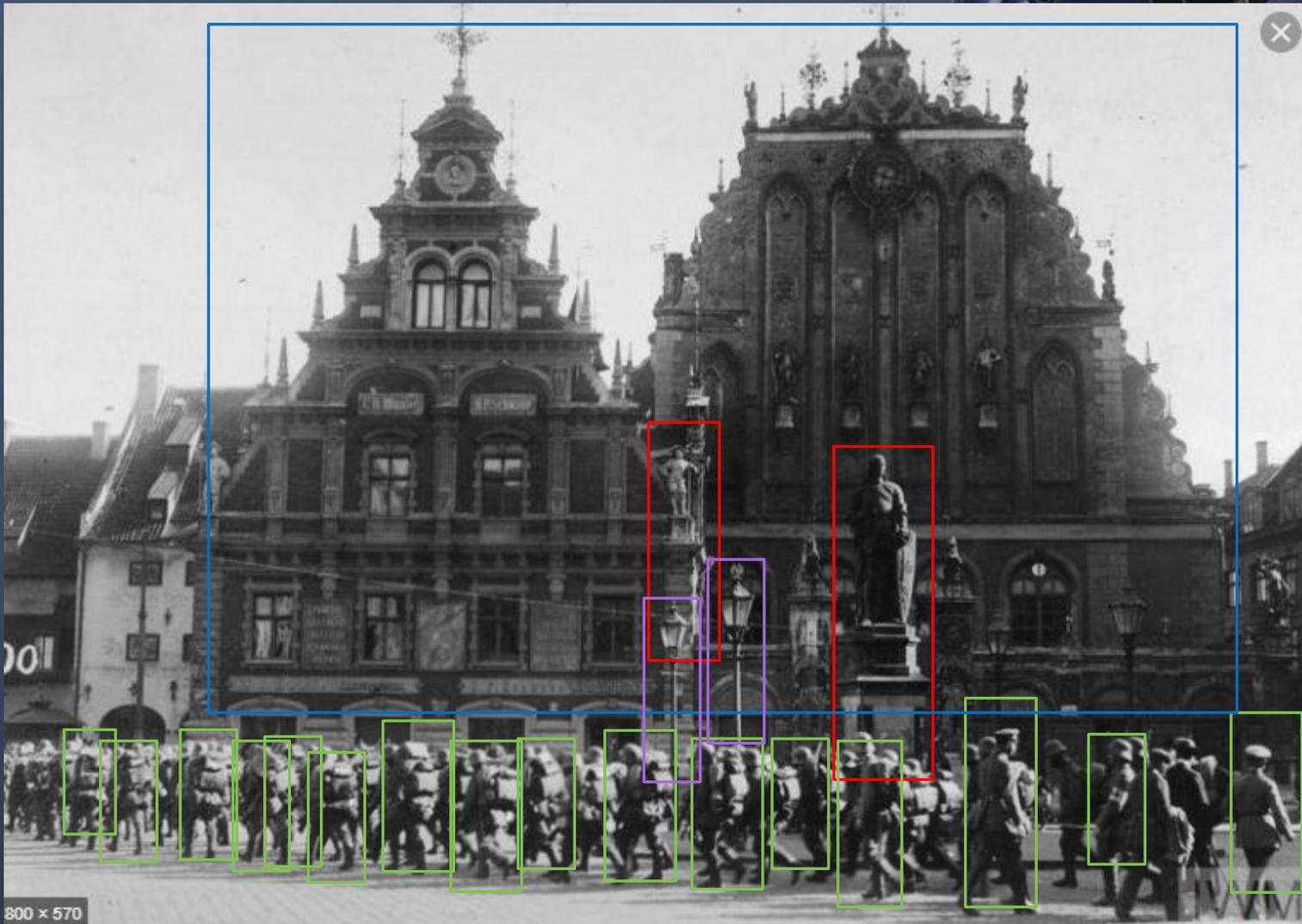
Future of museum and archive user experience with VR and AI





800 x 570

“war time and Riga House of the Black Heads.”



800 x 570

AI - artificial intelligence machine learning

1. soldier – 96% (related to - war)
2. House of the Black Heads 98%
3. Riga 96%
4. Statue 95%
5. House 99%



Thank You!