Democratization of AI using Microsoft Cognitive Services

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Tampa Bay Data Science Group
- Business Intelligence
- Statistical Computing
- Hadoop
- Big Data
- Natural Language Processing
- Machine Learning
- Text Analytics
- Data Analytics
- Data Visualization
- Predictive Analytics
- Data Mining
- Analytics
- Text Mining
- Data Science
- Big Data Analytics

Slides Courtesy of Microsoft Corporation
Adnan Masood, Ph.D. is a software architect, machine learning researcher, and Microsoft MVP for Data Platform. Before joining UST Global as Chief Architect of AI and Machine Learning, Dr. Masood worked at Green Dot Corporation, a leading prepaid financial technology institution as a Sr. Systems Architect. In the past life he has also served as principal engineer for an ecommerce start-up, and as a solutions architect for a leading British nonprofit organization.

A strong believer in the development community, Adnan is an active member of the Open Web Application Security Project (OWASP), an organization dedicated to software security. In the .NET community, he is a cofounder and president of the Pasadena .NET Developers group, co-organizer of Tampa Bay Data Science Group, and Irvine Programmer meetup. A certified ScrumMaster, Dr. Masood also hold certifications in big data, machine learning, and systems architecture from Massachusetts Institute of Technology; Application Security certification from Stanford University, and SOA Smarts certification from Carnegie Mellon University. He is a Microsoft Certified Solutions Developer, and Sun Certified Java Developer.

Dr. Masood teaches Data Science course at Park University, and has taught Windows Communication Foundation (WCF) courses at the University of California, San Diego. He is a regular speaker to various academic and technology conferences (IEEE-HST, IASA, and DevConnections), local code camps, and user groups. He is also a volunteer STEM FLL robotics coach for middle school students.

For more details, visit Adnan’s blog (http://blog.adnanmasood.com), GitHub repository (http://github.com/adnanmasood), and Twitter (@adnanmasood). Adnan can be reached at adnan.masood@owasp.org.
Drive Intelligence from Text in Smart Apps

The session covers how to use cognitive services to drive insights and intelligence in your applications. The session covers how to work with unstructured text and turn unstructured text into meaningful insights into mobile, web and line of business applications.

The session will be showing how to use a few lines of code to easily analyze sentiment, extract key phrases, detect topics, and detect language for any kind of text.

The session will provide an overview on Microsoft Cognitive Services and all related text analysis services including:

• Sentiment Analysis
• Key Phrase extraction
• Topic Detection
• Language detection

The session is code driven & will provide samples on how to build smart apps with cognitive services from Microsoft.
Microsoft Cognitive Services

Give your apps a human side

Vision
From faces to feelings, allow your apps to understand images and video

Speech
Hear and speak to your users by filtering noise, identifying speakers, and understanding intent

Language
Process text and learn how to recognize what users want

Knowledge
Tap into rich knowledge amassed from the web, academia, or your own data

Search
Access billions of web pages, images, videos, and news with the power of Bing APIs

Slides Courtesy of Microsoft Corporation
Language Understanding Intelligent Service (LUIS)

LUIS lets your app understand language

- LUIS is in beta and free to use
- Supported browsers: Internet Explorer 10/11, Chrome

https://www.luis.ai/
Why Microsoft Cognitive Services?

Roll your own with REST APIs
Simple to add: just a few lines of code required

Integrate into the language and platform of your choice
Breadth of offerings helps you find the right API for your app

Built by experts in their field from Microsoft Research, Bing, and Azure Machine Learning
Quality documentation, sample code, and community support

GET A KEY
BUILD

Easy
Flexible
Tested
Scenarios

- Emotion detection at retail displays
- Facial identification to find missing children
- Sentiment analysis to learn how customers feel
- Facial detection to calculate the male/female ratio at a nightclub
- Language understanding to allow automated support bots to understand natural language
- Object recognition to enable a blind person to read a menu
Computer Vision API
Distill actionable information from images

Face API
Detect, identify, analyze, organize, and tag faces in photos

Emotion API
Personalize experiences with emotion recognition

Video API
Analyze, edit, and process videos within your app
Speech

Bing Speech API
Convert speech to text and back again, and understand its intent

Speaker Recognition API
Give your app the ability to know who’s talking

Custom Recognition Intelligent Service
Fine-tune speech recognition for anyone, anywhere
Language

- Bing Spell Check API: Detect and correct spelling mistakes within your app
- Web Language Model API: Leverage the power of language models trained on web-scale data
- Linguistic Analysis API: Easily parse complex text with language analysis
- Language Understanding Intelligent Service: Teach your apps to understand commands from your users
- Text Analytics API: Detect sentiment, key phrases, topics, and language from your text
Text analytics

Sentiment analysis
Understand if a record has positive or negative sentiment

Key phrase extraction
Extract key phrases from a piece of text, and retrieve topics

Topic detection
Use clustering techniques to identify the trending topics on a large set of text records

Language detection
Identify the language, 120 supported languages
Text analytics

Sentiment analysis **English, Spanish, French, and Portuguese**
Understand if a record has positive or negative sentiment

Key phrase extraction **English, Spanish, German, and Japanese**
Extract key phrases from a piece of text, and retrieve topics

Topic detection **English**
Use clustering techniques to identify the trending topics on a large set of text records

Language detection
Identify the language, 120 supported languages
Demo

Text analytics
http://text-analytics-demo.azurewebsites.net
Language understanding (LUIS)

Define entities and intents
Entities—DepartureCity, ArrivalCity, DepartureDate, ReturnDate
Intent—book a flight

Map some utterances to an intent
Examples: “I want to go to Paris from Sept 25 to Sept 29, 2016”, “Book me a flight from DTW to CDG leaving on 9/25/2016 and returning 9/28/2016”, etc.

Help your model improve over time based on real feedback
See what real users are sending to your model, and map those utterances to intents (or create new intents based on what your users are asking).
Knowledge

Academic Knowledge API
Explore relationships among academic papers, journals, and authors

Knowledge Exploration Service
Add interactive search over structured data to your project

Entity Linking Service
Contextually extend knowledge of people, locations, and events

Recommendations API
Provide personalized product recommendations for your customers
Apps Powered by MS Cognitive Services

I think it’s a person sitting in front of a computer and he seems 😊. I am 99% sure that’s Bill Gates

CaptionBot.ai

Celebslike.me

ProjectMurphy.net
## Cognitive Services

**microsoft.com/cognitive**

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**WebLM**
## Vertical Search APIs

Get more results, features and metadata tailored to each search vertical

### Image Search API

- **Enhanced metadata and filters (size, license, style, freshness, color)**
- **Image insights (entity recognition, visually similar)**

**Source:** nasa.gov

**URL:** https://bingapis.azure-api.net/v5/images/search?q=shuttle+launch

### Video Search API

- **Enhanced metadata and filters (price, resolution, length, freshness)**
- **Motion thumbnails (video preview)**

**Source:** youtube.com

**URL:** https://bingapis.azure-api.net/v5/videos/search?q=viral+videos

### News Search API

- **News by category/market, and trending news**
- **Rich article metadata (featured entities)**

**Source:** cnn.com

**URL:** https://bingapis.azure-api.net/v5/news/search?q=cuba

*Screenshots show actual search results in bing.com*
Accessing the APIs

1. Obtain API subscription key from microsoft.com/cognitive

2. Call REST endpoint, and pass API key via special header

GET https://bingapis.azure-api.net/v5/search?q=nasa HTTP/1.1
OCP-Apim-Subscription-Key: <API KEY>
LUIS + Computer Vision
Language Understanding Models

News about flight delays
Language Understanding Models

Reduce labeling effort with interactive featuring
Seamless integration to Speech API
Deploy using just a few examples with active learning
Supports 5 languages (English, Chinese, Italian, French, Spanish)
Demo
Updated Computer Vision API

Content of Image:

Categories

- **v0:**
  - { "name": "animal", "score": 0.9765625 }

- **v1:**
  - { "name": "grass", "confidence": 0.9999992847442627 },
  - { "name": "outdoor", "confidence": 0.999672551727295 },
  - { "name": "cow", "confidence": 0.99954754114151 },
  - { "name": "field", "confidence": 0.9976195693016052 },
  - { "name": "brown", "confidence": 0.98893649394989 },
  - { "name": "animal", "confidence": 0.97904372215271 },
  - { "name": "standing", "confidence": 0.9632766360981445 },
  - { "name": "mammal", "confidence": 0.93601758032349, "hint": "animal" },
  - { "name": "wire", "confidence": 0.8946959376335144 },
  - { "name": "green", "confidence": 0.8844101428985596 },
  - { "name": "pasture", "confidence": 0.8332059383392334 },
  - { "name": "bovine", "confidence": 0.5618471503257751, "hint": "animal" },
  - { "name": "grassy", "confidence": 0.48627158999443054 },
  - { "name": "lush", "confidence": 0.1874018907546997 },
  - { "name": "staring", "confidence": 0.165890634059906 }

Describe

- 0.975 "a brown cow standing on top of a lush green field"
- 0.974 “a cow standing on top of a lush green field”
- 0.965 “a large brown cow standing on top of a lush green field”
NEW:
  • Translate speech

Not NEW - but still very useful:
  • Translate text between 50 languages, any to any
  • Highly customizable translation
    • Collaborative methods for engaging the community to improve translation
    • Self-service custom training, using your previously translated documents
  • AJAX, REST and SOAP interface
  • Methods:
    • Translate, Detect, Speak, AddTranslation, GetTranslations, BreakSentences
    • Array variants of the above
Developer Call to Action

• Sign up and get started today for free at www.microsoft.com/cognitive
Developer Resources

Preview Pricing
https://www.microsoft.com/cognitive-services/en-us/pricing

Documentation

Client SDKs and Samples

Join Our Community
https://stackoverflow.com/questions/tagged/microsoft-cognitive
https://cognitive.uservoice.com/
Q & A