



*A look at utilizing modern
interactions with devices*

Alternative Device Interfaces and Machine Learning



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PLURALSIGHT





Identify Existing Products, Services and Technologies in Use for Microsoft Azure

Individuals and organizations
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What are we doing

ALTERNATIVE INTERFACES

A look at alternative interfaces in television and movies, and then look at the more realistic alternatives.

BIOMETRIC RECOGNITION

Utilize Facial and Speaker recognition to secure an application. Once secured, create a custom speech to text for just our voice.

LANGUAGE UNDERSTANDING

Create a language understanding application to process the requests we parse with speech to text.





Alternative Interfaces

*Apps without mouse, keyboard,
or touch*



Futuristic User Experience

- Over the top Dashboard
- Holographic Interface
- Hackers Console
- Magician on the line



Over the top dashboard



Holographic Interface



Hackers Console

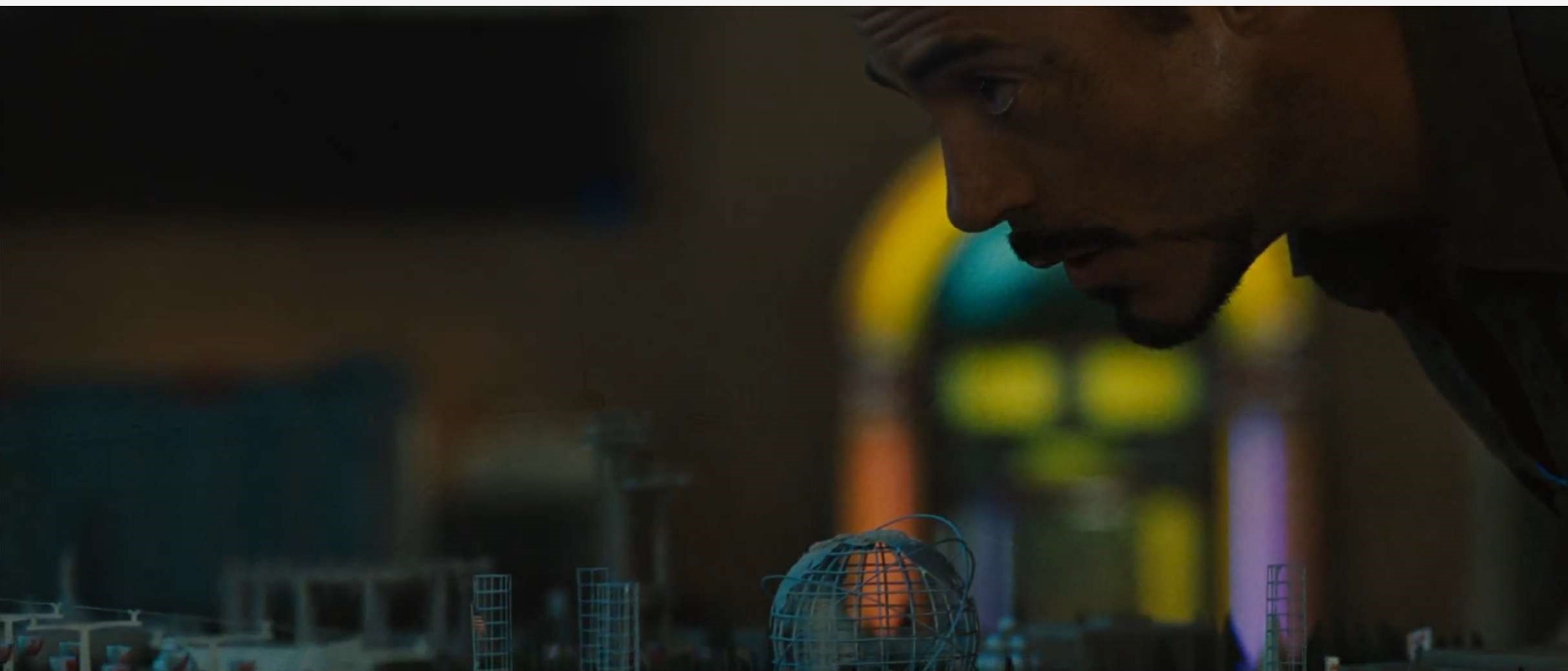


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Magician on the line





Magician on the line



Modern User Experience

- Magician Attempts
- Digital Accessibility
- Computer Brain Interface
- Virtual & Mixed Reality



Magician Attempts



AMAZON ALEXA



GOOGLE HOME

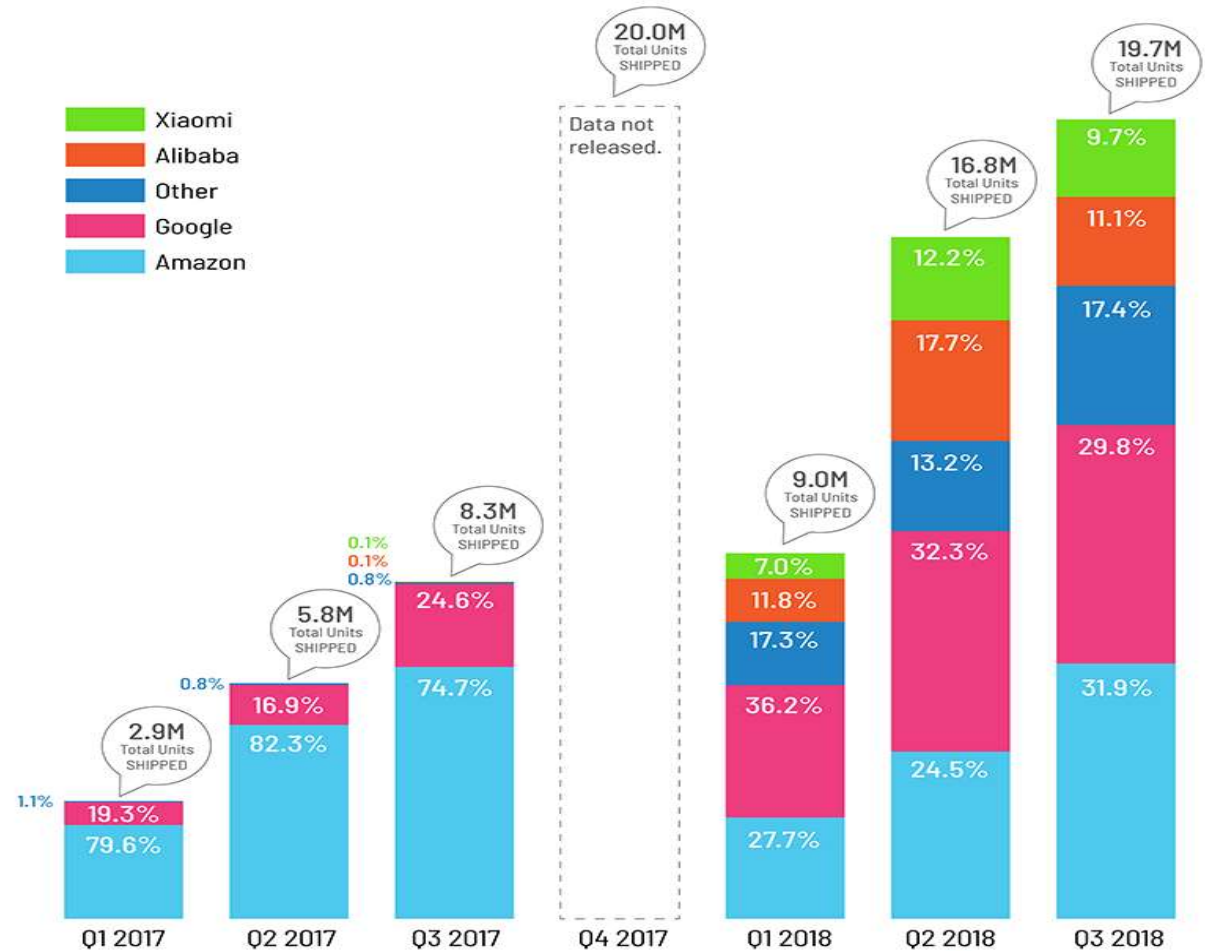


APPLE HOMEPOD

Global Market Share

Amazon and Google lead with Alibaba and Xiaomi following closely behind in global smart speaker sales.

Global Smart Speaker Sales Share - 2017 - Q3 2018

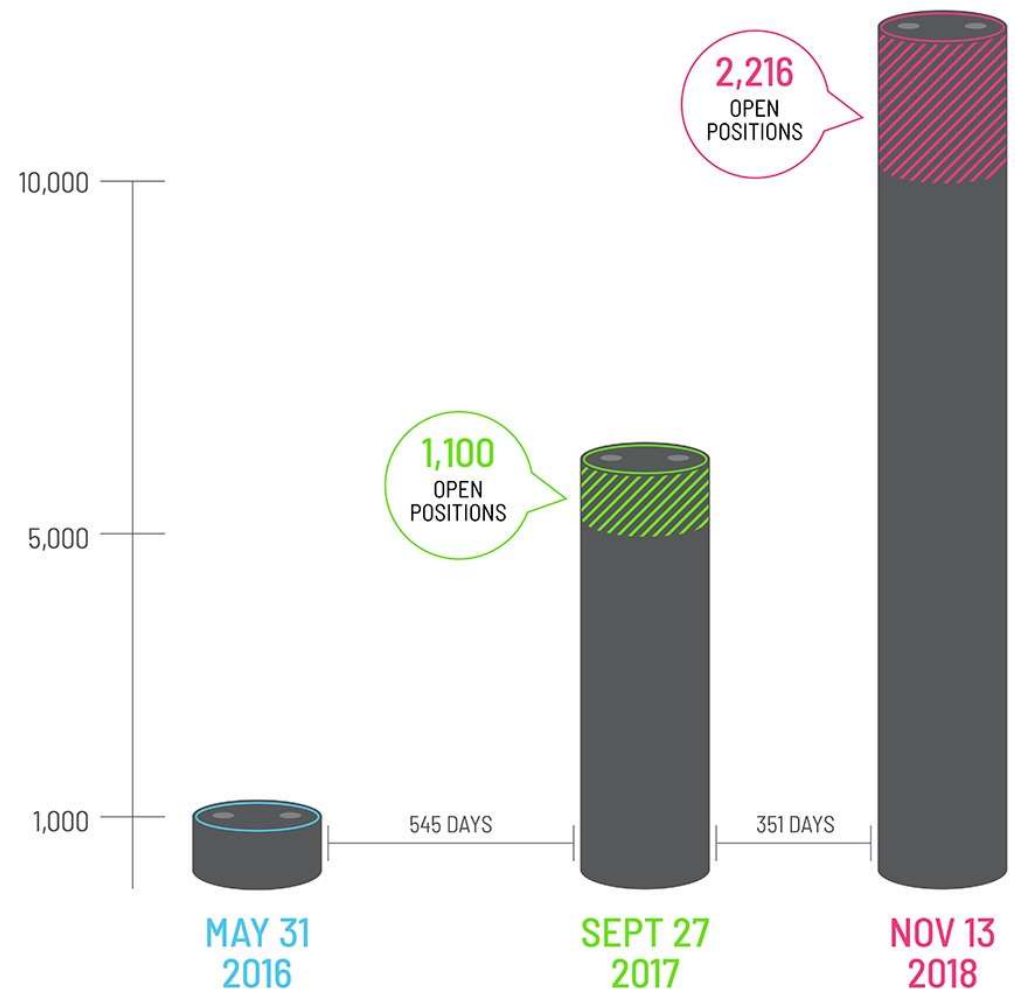


Source: Canalys

Growing Opportunities

Amazon has over 21,000 open jobs listed on its career website today. About 10.5% of those are related to Alexa or the Echo smart speaker directly

Amazon Alexa & Echo Employee Headcount



Source: Voicebot.ai, Wall Street Journal Nov 2018



Accessibility

Amplifying human capability



Gesture
Recognition



Digital Reading



Language



Guidance



Adaptive Input



Dictation



Inclusive Design

INCLUSIVE DESIGN DEFINED

A design methodology that enables and draws on the full range of human diversity.

ACCESSIBILITY DEFINED

1. The qualities that make an experience open to all.
2. A professional discipline aimed at achieving No. 1



Inclusive Design



Recognize exclusion



Solve for one, extend to many



Learn from diversity



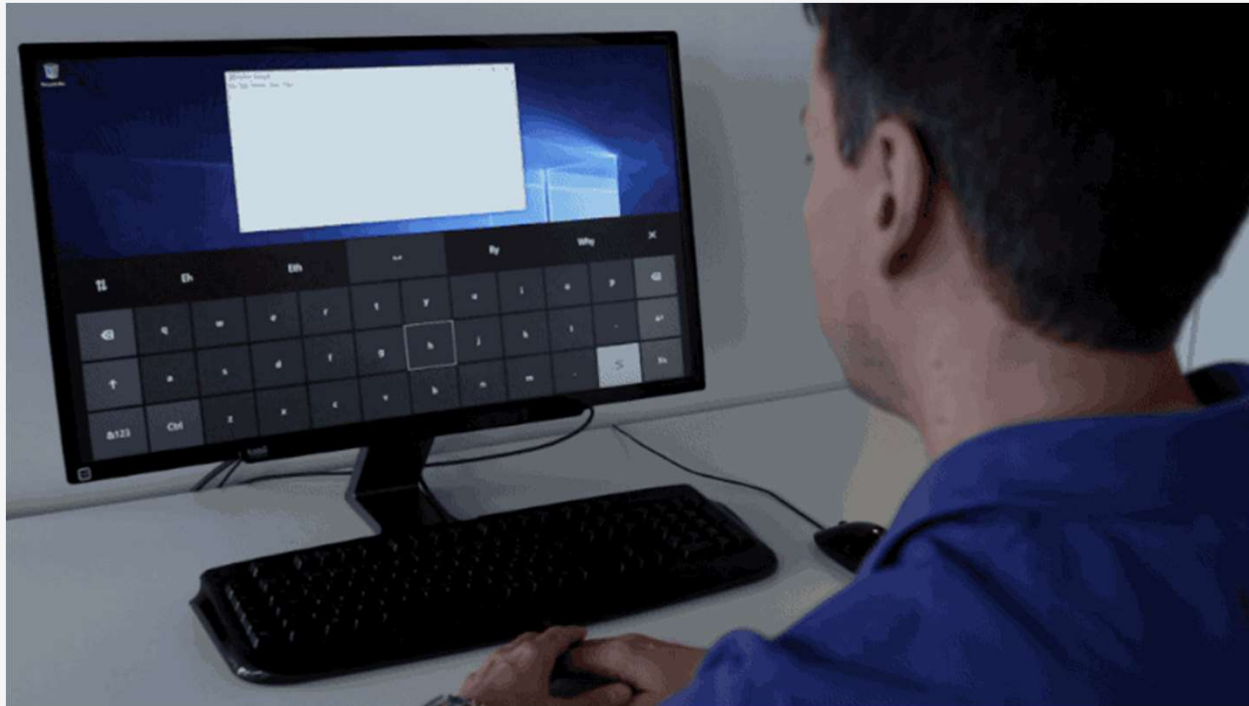
Mismatched Human Interaction

Exclusion can fall into three separate categories:

- Permanent
- Temporary
- Situational

	Permanent	Temporary	Situational
Touch	 One arm	 Arm injury	 New parent
See	 Blind	 Cataract	 Distracted driver
Hear	 Deaf	 Ear infection	 Bartender
Speak	 Non-verbal	 Laryngitis	 Heavy accent

Digital Accessibility



AI for Accessibility

AI for Accessibility amplifies human capability through grants, investments of technology, and expertise.

They are looking for individuals or teams who are not only passionate about making the world more inclusive, but also firmly rooted in the communities they intend to benefit.

They want to invest in ideas that are developed by or with people with disabilities.



AI for Accessibility

TECHNOLOGY

Get access to our cloud and artificial intelligence (AI) platform to create and test new AI applications for people with disabilities.

KNOWLEDGE

Consult with our engineers to accelerate the development of your ideas and extend the impact of your solution.

PARTNERSHIP

We will ensure organizations maximize the accessibility of their offerings and create empowering experiences for people with disabilities.



AI for Accessibility



Employment



Daily Life



Communication and connection

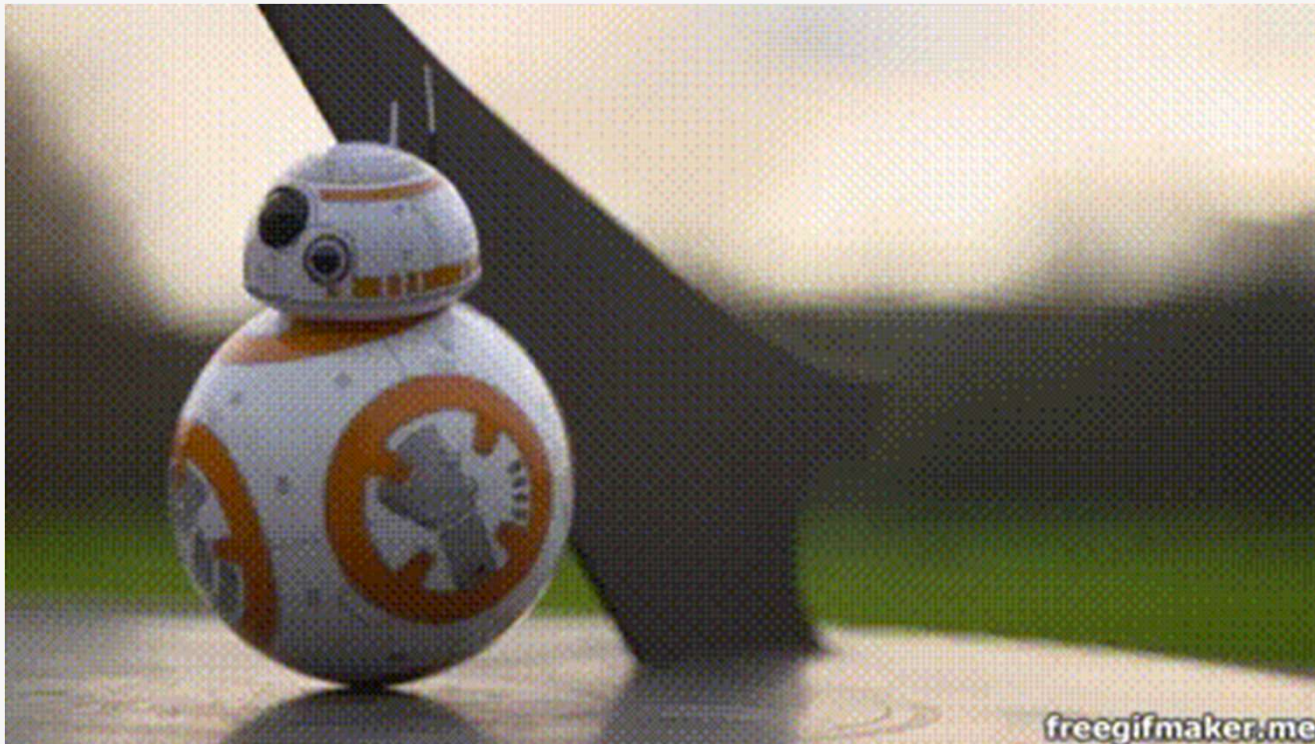


AI for Accessibility

- Azure compute credits: This is the fast track to get you up and running on Azure AI Service with grants of Azure compute credits worth \$10,000, \$15,000, or \$20,000 (depending on your project scope and needs).
- Azure compute credits Plus: In addition to Azure compute credits, these grants cover costs related to collecting or labeling data, developing models, or other engineering-related work. Applications are evaluated on their scientific merit, innovative use of AI technology, and potential for scalability.



Computer Brain Interface



Computer Brain Interface



Computer Brain Limitations



Poor information transfer rate (ITR)



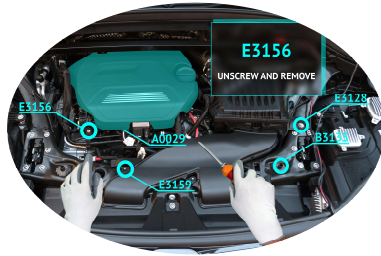
Can involve invasive Surgery



Effect of feedback on robust control

Virtual and Mixed Reality



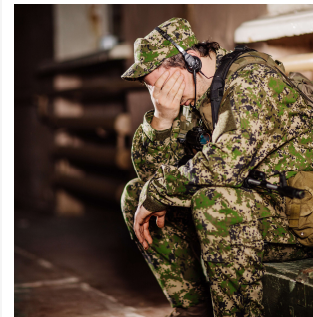


VR/MR Uses

Not just for games, MR and VR have multiple use cases in multiple industries



Game Development



PTSD Treatment



Medical Training



Architecture Modeling



Real Estate



Military Training



Why VR and AR?



Why VR and AR?



22 Million Headsets expected to be purchased in 2018



Every major tech company has a product for it



Accessible to most developers (more than AI)





VR/AR Devices



Magic Leap



Vive



HoloLens



Oculus Rift

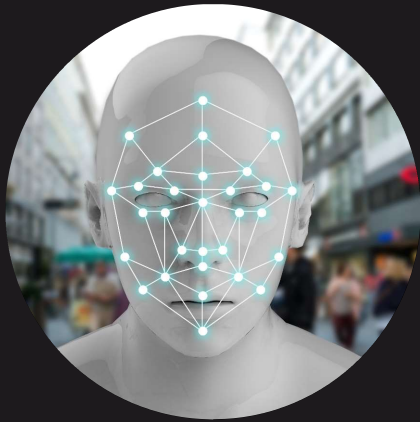


Playstation VR



Google Glass





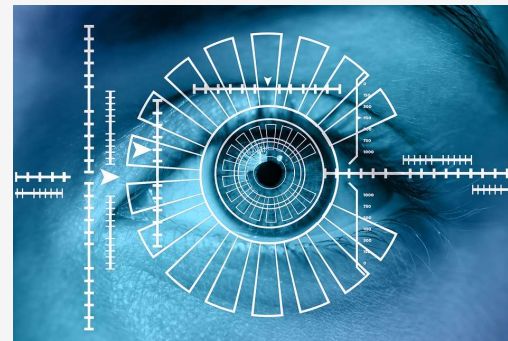
Biometric Recognition

Securing apps with biometrics



Securing an app

Biometric security is a security mechanism used to authenticate and provide access to a facility or system based on the automatic and instant verification of an individual's physical characteristics.



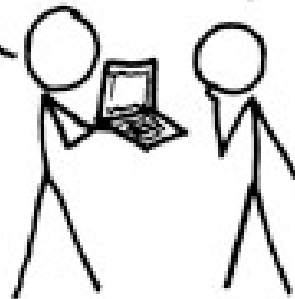
Securing an app

A CRYPTO NERD'S
IMAGINATION:

HIS LAPTOP'S ENCRYPTED.
LET'S BUILD A MILLION-DOLLAR
CLUSTER TO CRACK IT.

BLAST! OUR
EVIL PLAN
IS FOILED!

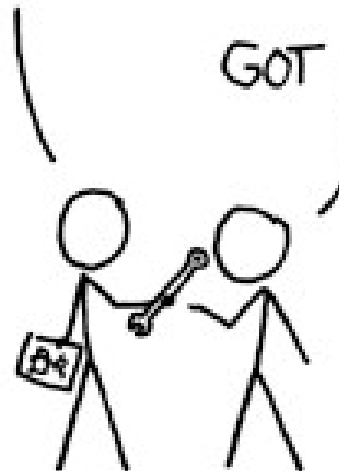
NO GOOD! IT'S
4096-BIT RSA!



WHAT WOULD
ACTUALLY HAPPEN:

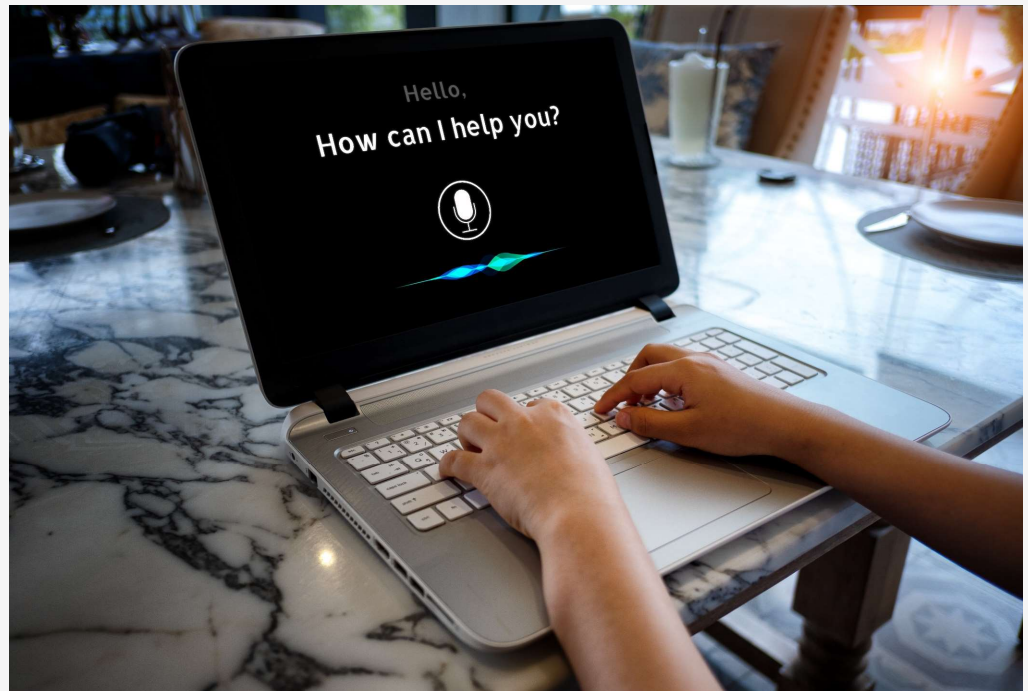
HIS LAPTOP'S ENCRYPTED.
DRUG HIM AND HIT HIM WITH
THIS \$5 WRENCH UNTIL
HE TELLS US THE PASSWORD.

GOT IT.





Speaker Recognition



Cognitive Services - Speech



Text to Speech / Speech to Text

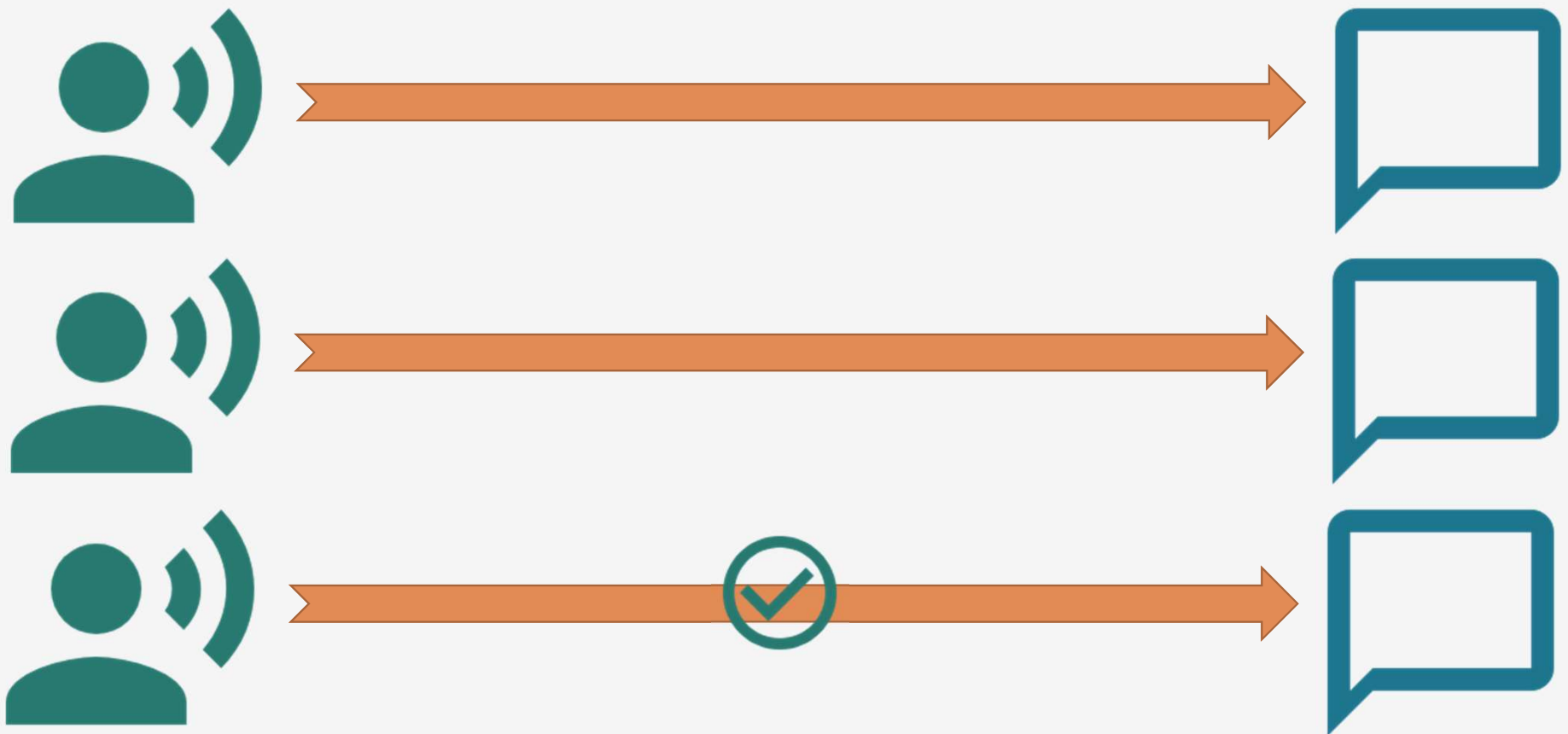


Speaker Recognition



Speech Translation

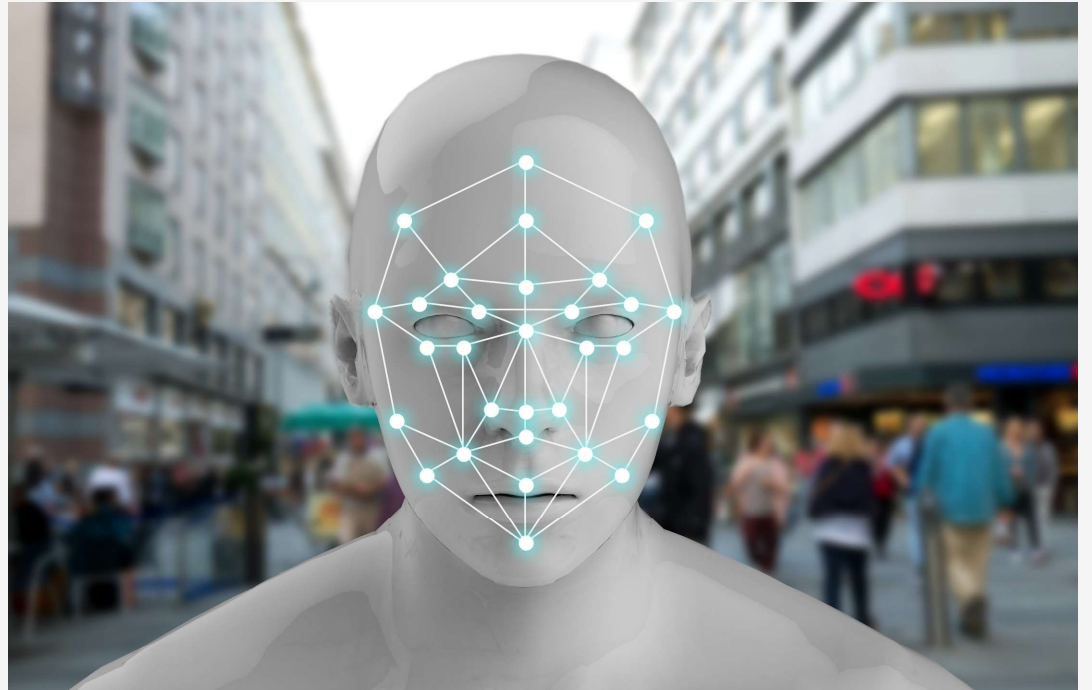




Speaker Recognition Demo



Facial Recognition





Vision



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



Content
Moderator
Machine-assisted moderation
of text and images, augmented
with human review tools



Video Indexer
Process and extract
smart insights from
videos





Computer Vision Demo





A sub-field of AI that is focused on enabling computers to understand and process human languages

Natural Language Processing (NLP)

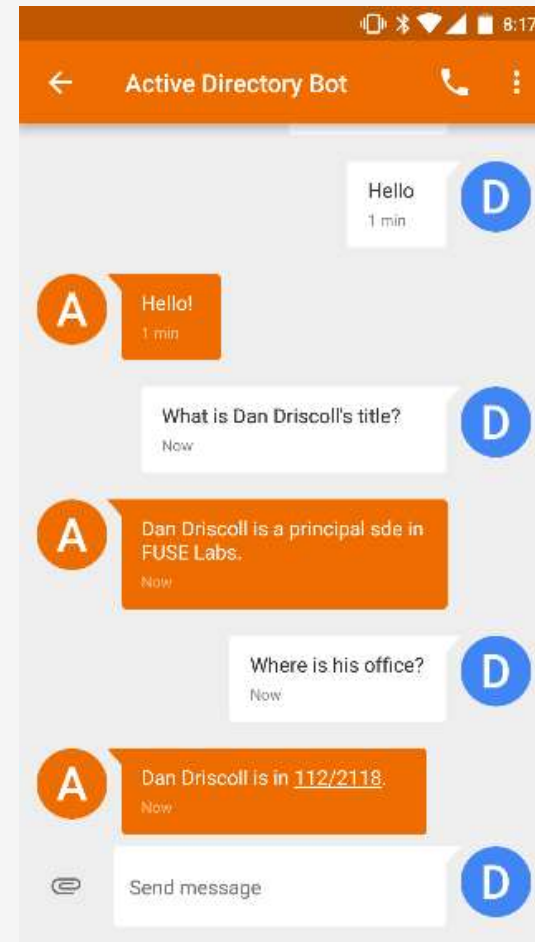


Language Understanding

When does flight AF32 arrive?

Where is the nearest bathroom?

Please book a flight to Orlando.



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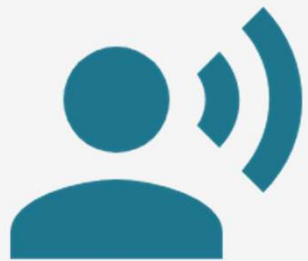


Examples

- The Pope's baby steps on gays
- Boy paralyzed after tumor fights back to gain black belt
- Scientists study whales from space
- Juvenile Court to Try Shooting Defendant

*Stanford University School of Engineering - Lecture 1 | Natural Language Processing with Deep Learning
https://www.youtube.com/watch?v=OQQ-W_63UgQ&t=1s

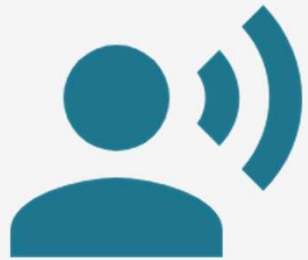




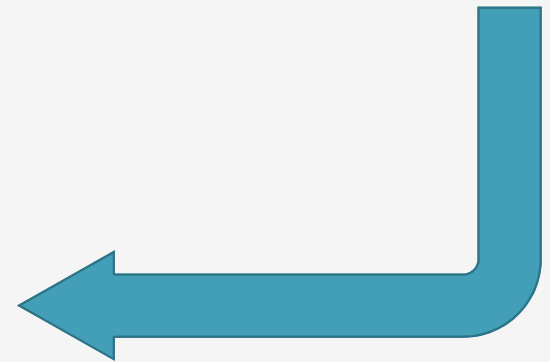
Text



LUIS



Intent
Entities



Natural Language Processing Demo



What we did

ALTERNATIVE INTERFACES

A look at alternative interfaces in popular media and then look at not so popular alternatives.

BIOMETRIC RECOGNITION

Utilize Facial and Speaker recognition to secure an application. Once secured, create a custom speech to text for just our voice.

LANGUAGE UNDERSTANDING

Create a language understanding application to process the requests we parse with speech to text.



Additional Resources

Cognition as a Service:

- [Cognitive Services](#)
- [Amazon ML Services](#)
- [Google Cloud AI](#)
- [IBM Watson](#)



[Accessibility for Good](#)



[ADA Compliance and Information](#)



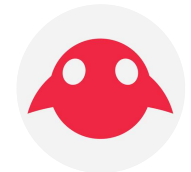
[Amazon Alexa](#)



[Translation as a Service](#)



[Using the Force \(Computer Brain Interface\)](#)



[MR with Magic Leap](#)



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