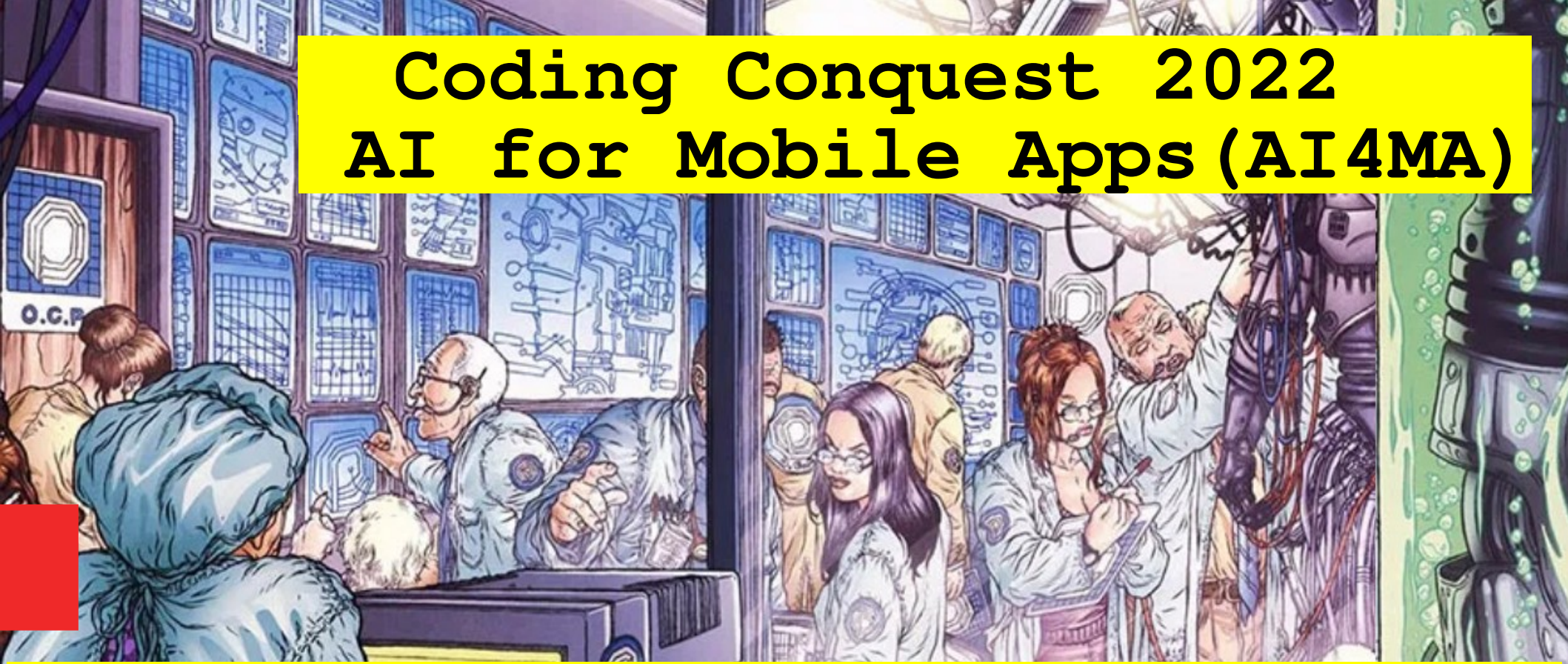
Coding Conquest 2022
AI for Mobile Apps(AI4MA)



Session 2:Enhancing Mobile Apps with AI

اونيورسيتي تيكنولوكي بروني
UNIVERSITI TEKNOLOGI BRUNEI

Prof. Somnuk Phon-Amnuaisuk
UTB, SCI June 2022

Picture: credited https://www.cyberpunk.net

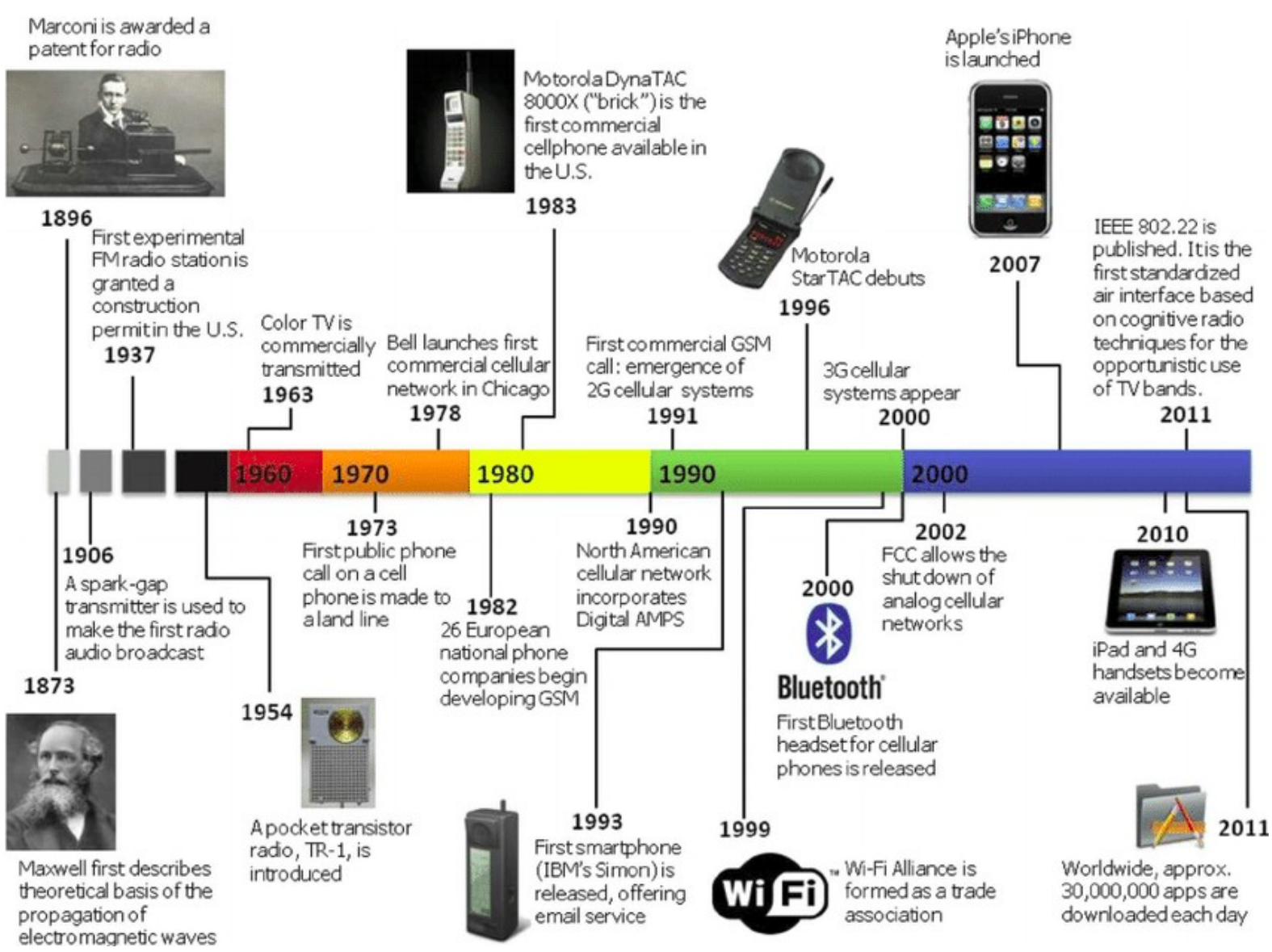

meme
A meme (/' mi: m/ meem), a neologism coined by Richard Dawkins, is "an idea, behavior, or style that spreads from person to person within a culture". A meme acts as a unit for carrying cultural ideas, symbols, or practices that can be transmitted from one mind to another through writing, speech, gestures, rituals, or other imitable phenomena with a mimicked theme.

Outline

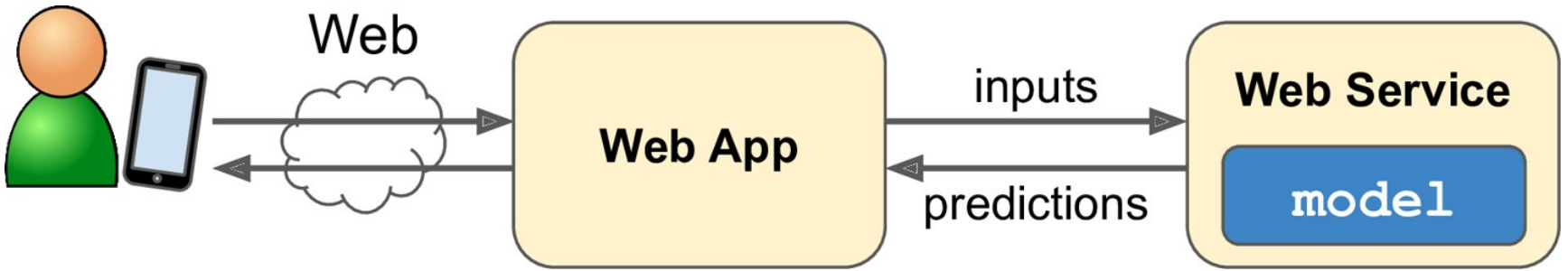
- Intelligent Mobile Applications
- Examples of domains and use cases
- Enhancing mobile apps with AI

Intelligent Mobile Apps

- Enabling technologies
  - ICT technology
  - Pervasive computing, Cognitive computing, Creative computing and Mixed reality
- Potential applications
  - Education, Fin tech, Industry 4.0
  - Health, Music and Art
- Signatures of intelligent mobile apps
  - Data-driven, adaptive to context
  - Support personalized features
  - Support proactive features

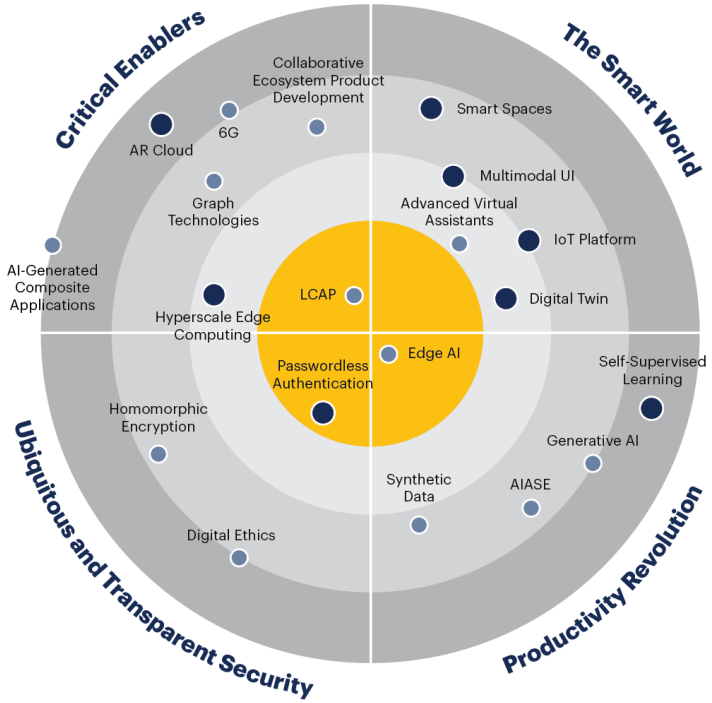

Marconi is awarded a patent for radio
1896
First experimental FM radio station is granted a construction permit in the U.S.
1937
Color TV is commercially transmitted
1963
Bell launches first commercial cellular network in Chicago
1978
Motorola DynaTAC 8000X ("brick") is the first commercial cellphone available in the U.S.
1983
First commercial GSM call: emergence of 2G cellular systems
1991
Motorola StarTAC debuts
1996
3G cellular systems appear
2000
Apple's iPhone is launched
2007
IEEE 802.22 is published. It is the first standardized air interface based on cognitive radio techniques for the opportunistic use of TV bands.
2011
1960
1970
1980
1990
2000
1906
A spark-gap transmitter is used to make the first radio audio broadcast
1873
Maxwell first describes theoretical basis of the propagation of electromagnetic waves
1954
A pocket transistor radio, TR-1, is introduced
1973
First public phone call on a cell phone is made to a land line
1982
26 European national phone companies begin developing GSM
1990
North American cellular network incorporates Digital AMPS
1993
First smartphone (IBM's Simon) is released, offering email service
1999
2000
Bluetooth
First Bluetooth headset for cellular phones is released
2002
FCC allows the shut down of analog cellular networks
2010
iPad and 4G handsets become available
Wi Fi
Wi-Fi Alliance is formed as a trade association
2011
Worldwide, approx. 30,000,000 apps are downloaded each day

Intelligent Mobile Apps



- Mobile app is an application designed to run on mobile devices e.g., phone, watch and glass, etc.
- Web app is application software that runs on a webserver.
- Web applications are accessed by the users through a web browser.

Impact Radar for 2022



Range
- 6 to 8 Years
- 3 to 6 Years
- 1 to 3 Years
- Now (0 to 1 Years)

Mass
- Low
- Medium
- High
- Very High

gartner.com

Source: Gartner

Gartner

These trends center around four key themes:

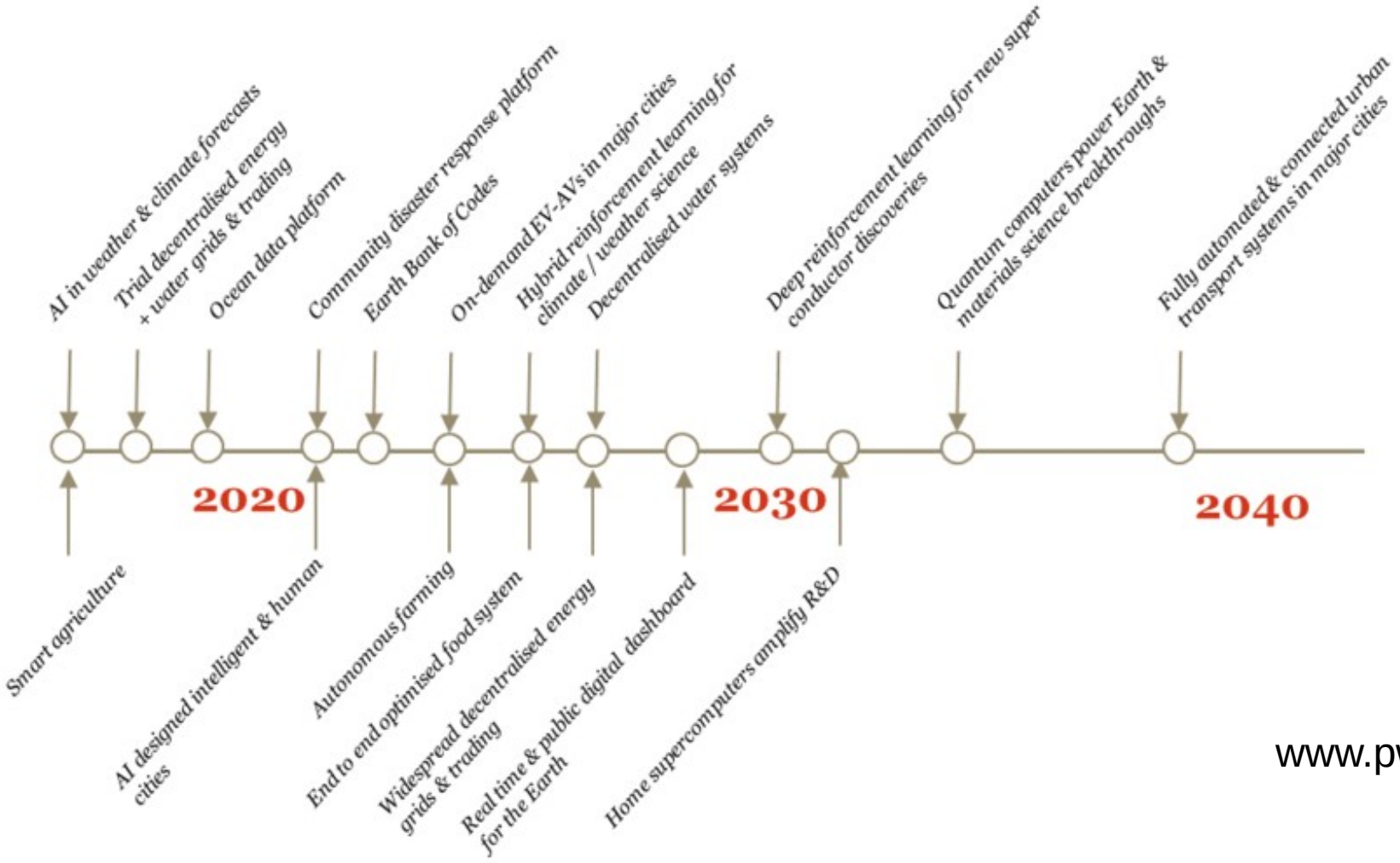
1) The smart world: Change how people interact with the world around them.

2) Productivity revolution: Build on core AI technologies and extend computing ability.

3) Ubiquitous and transparent security: Underscore the importance of protecting an increasingly digital world.

4) Critical enablers: Act as an additive force to bring the emerging technologies and trends together, and heighten the benefits by reshaping business practices, processes, methods, models and/or functions in markets where they are applied.

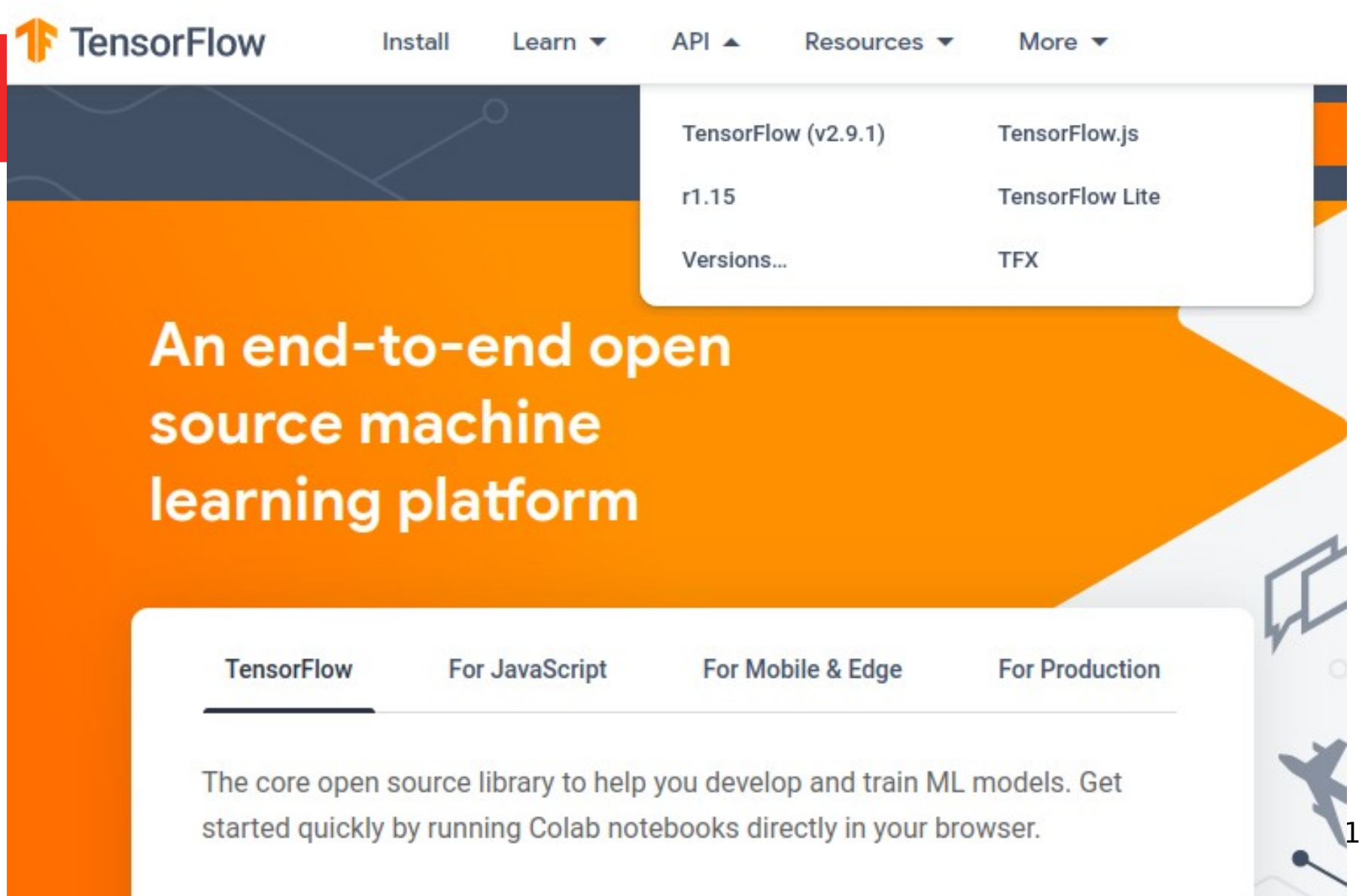
AI for the Earth game-changers: indicative timeline



Enhancing Mobile Apps with AI

Goal: well-beings

- Security Functions e.g., authentication
- Automated Reply/Chatbot Functions
- Real-Time Language Translation
- Emotion Recognition
- User Modeling, Behaviour Profiling
- Personal secretariat, Personal Advisor, Personal doctor, etc.


TensorFlow
Install
Learn
API
Resources
More
TensorFlow (v2.9.1)
TensorFlow.js
r1.15
TensorFlow Lite
Versions...
TFX
An end-to-end open source machine learning platform
TensorFlow
For JavaScript
For Mobile & Edge
For Production
The core open source library to help you develop and train ML models. Get started quickly by running Colab notebooks directly in your browser.

TensorFlow & Keras

- TensorFlow is a free and open-source software library for machine learning. It can be used across a range of tasks but has a particular focus on training and inference of deep neural networks.
- Keras is an API designed for human beings, not machines. Keras follows best practices for reducing cognitive load: it offers consistent & simple APIs, it minimizes the number of user actions required for common use cases, and it provides clear & actionable error messages.

TensorFlow JS https://www.tensorflow.org/js/demos

LipSync by YouTube

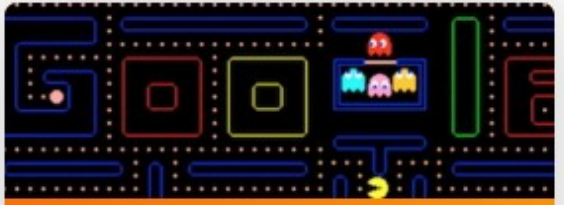
See how well you synchronize to the lyrics of the popular hit "Dance Monkey." This in-browser experience uses the Facemesh model for estimating key points around the lips to score lip-syncing accuracy.

Explore demo ↗ View code

Emoji Scavenger Hunt

Use your phone's camera to identify emojis in the real world. Can you find all the emojis before time expires?

Explore demo ↗ View code



Webcam Controller

Play Pac-Man using images trained in your browser.

Explore demo ↗ View code

Teachable Machine

No coding required! Teach a machine to recognize images and play sounds.

Explore demo ↗ View code

Move Mirror

Explore pictures in a fun new way, just by moving around.

Explore demo ↗ View code

Performance RNN

Enjoy a real-time piano performance by a neural network.

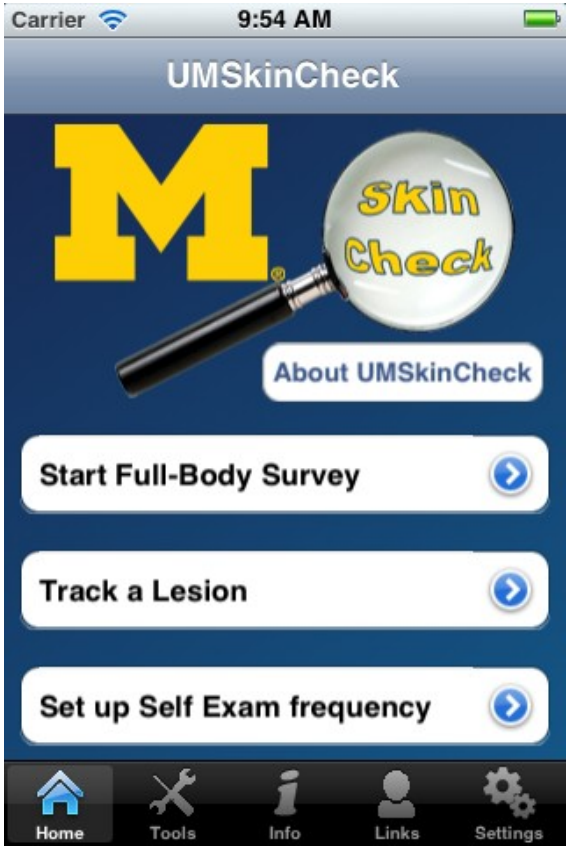
Explore demo ↗ View code

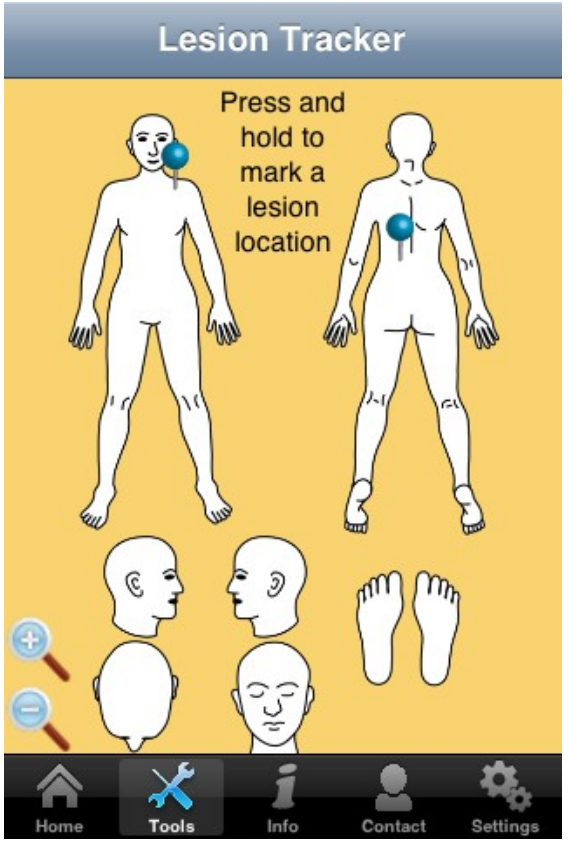
Ex. Smart City

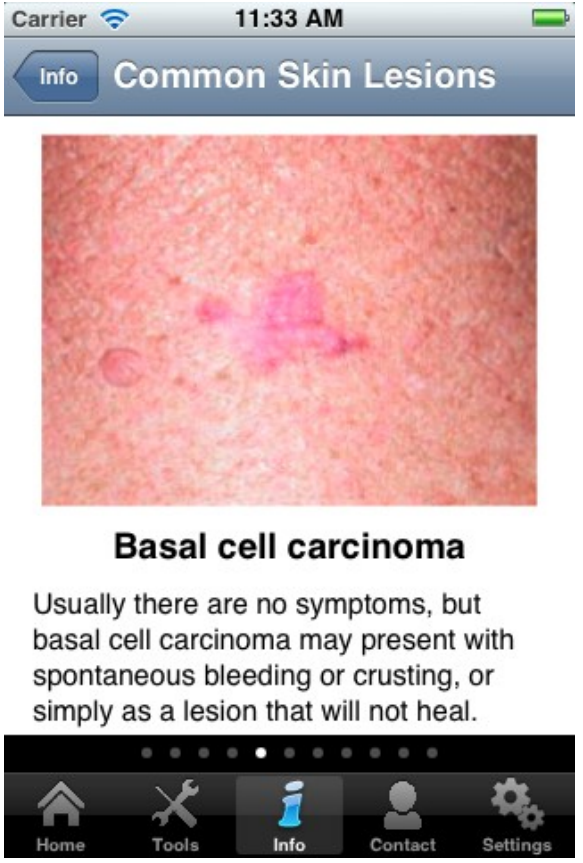
https://aliga.sk/en/what-the-heck-is-a-smart-city/

Ex. Traffic Monitoring

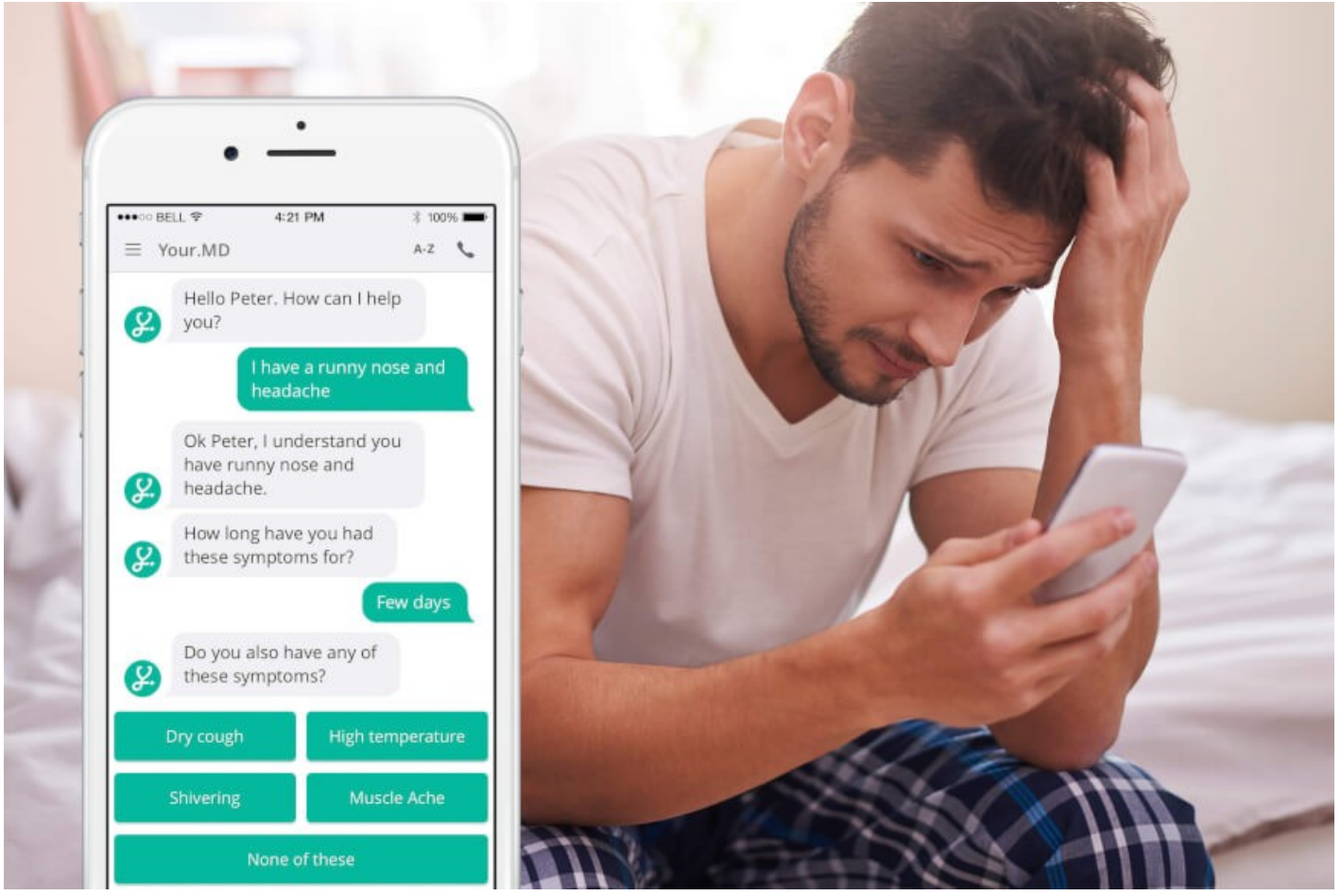
Ex. Health Application



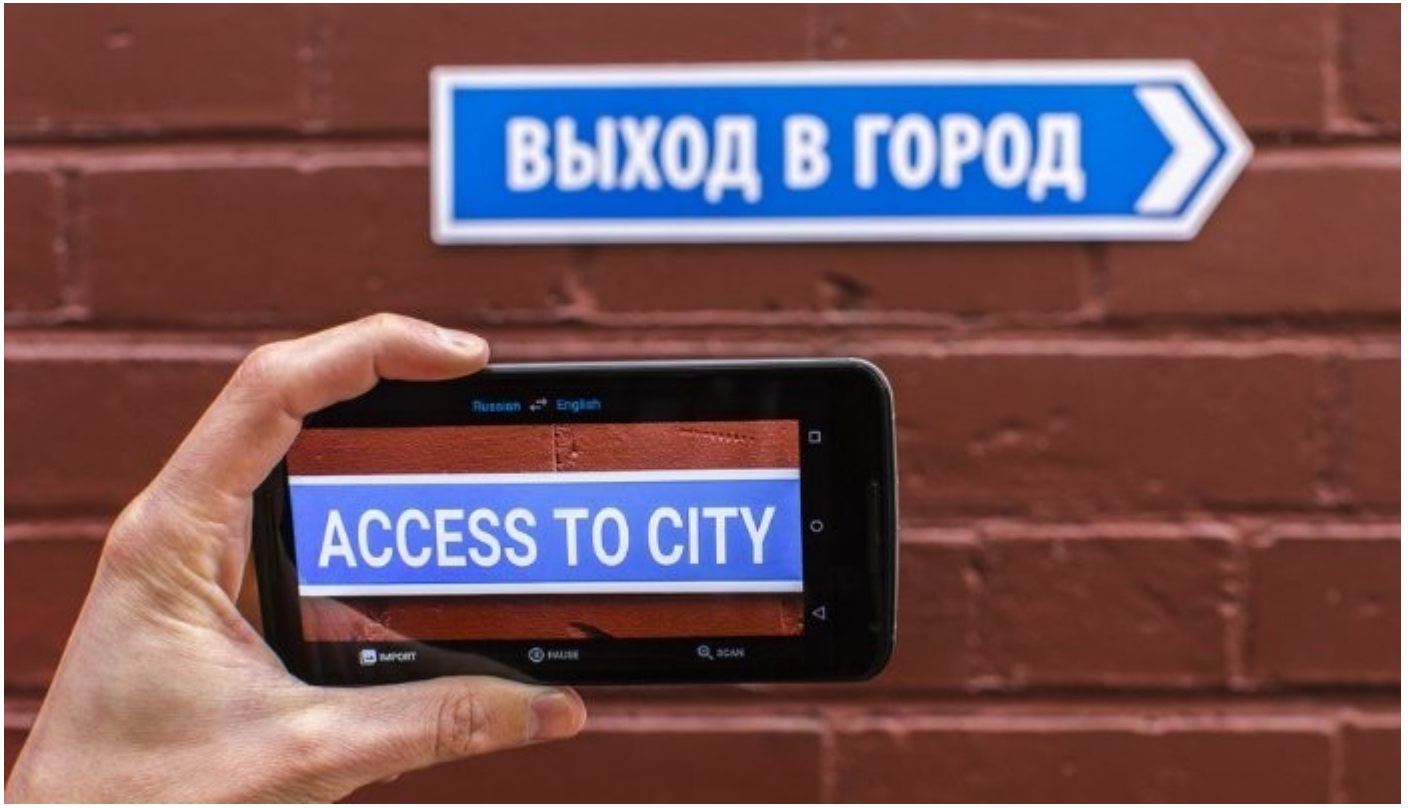




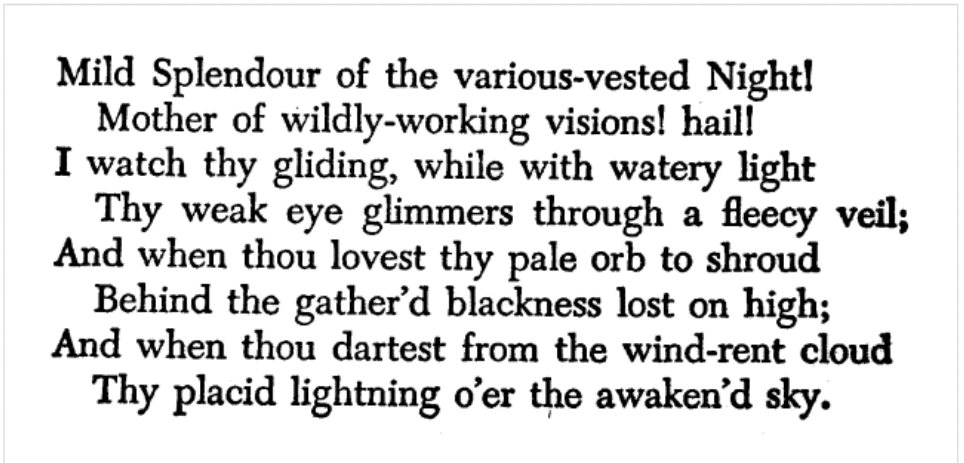
Ex. Health Application



Ex. Photo Translation



Ex. OCR



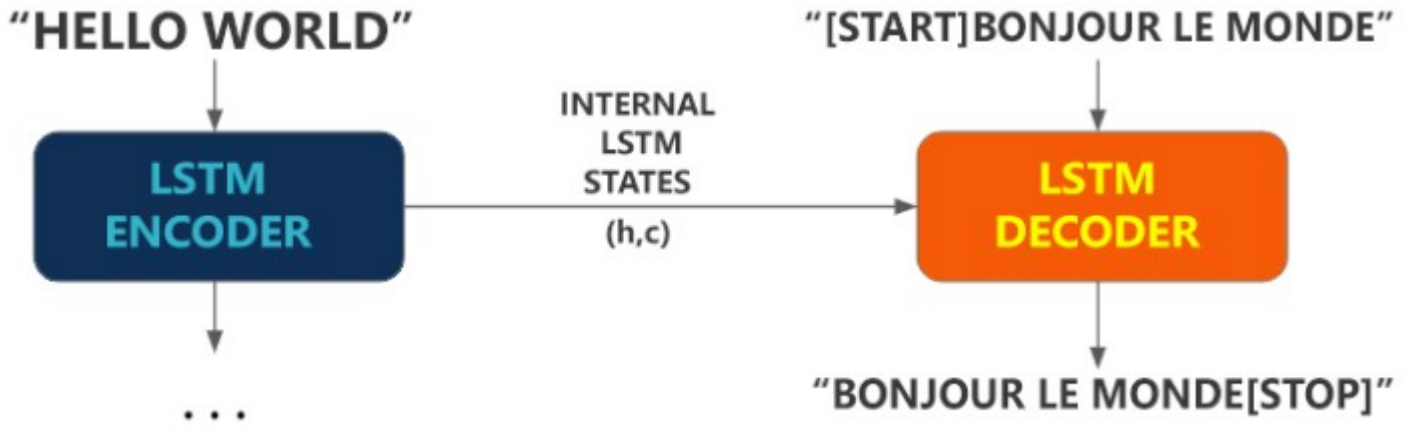
Mild Splendour of the various-vested Night!
Mother of wildly-working visions! hail!
I watch thy gliding, while with watery light
Thy weak eye glimmers through a fleecy veil;
And when thou lovest thy pale orb to shroud
Behind the gather'd blackness lost on high;
And when thou dartest from the wind-rent cloud
Thy placid lightning o'er the awaken'd sky.

→

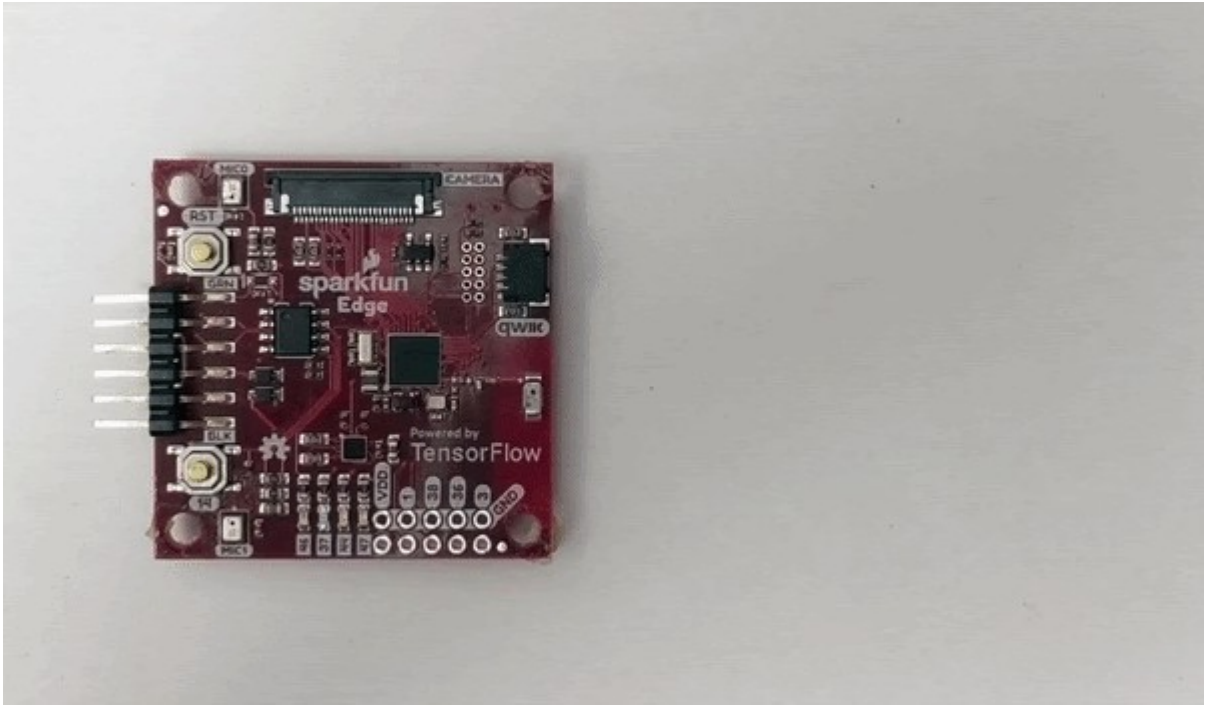
Click here to recognize text in the demo image, or drop an English image anywhere on this page.

Ex. Text Translation

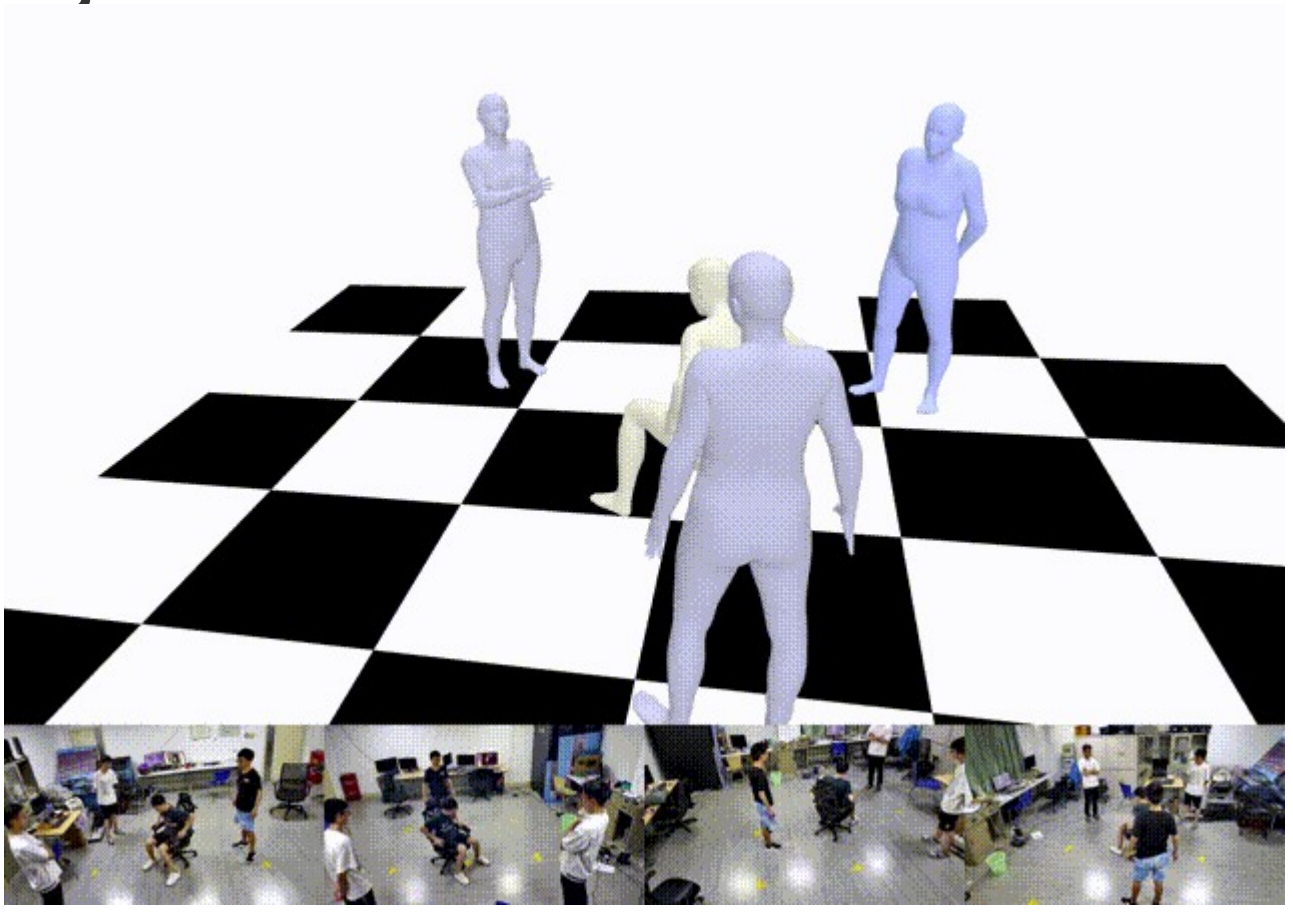
https://storage.googleapis.com/tfjs-examples/translation/dist/index.html



Ex. Text to Speech, Speech to Text



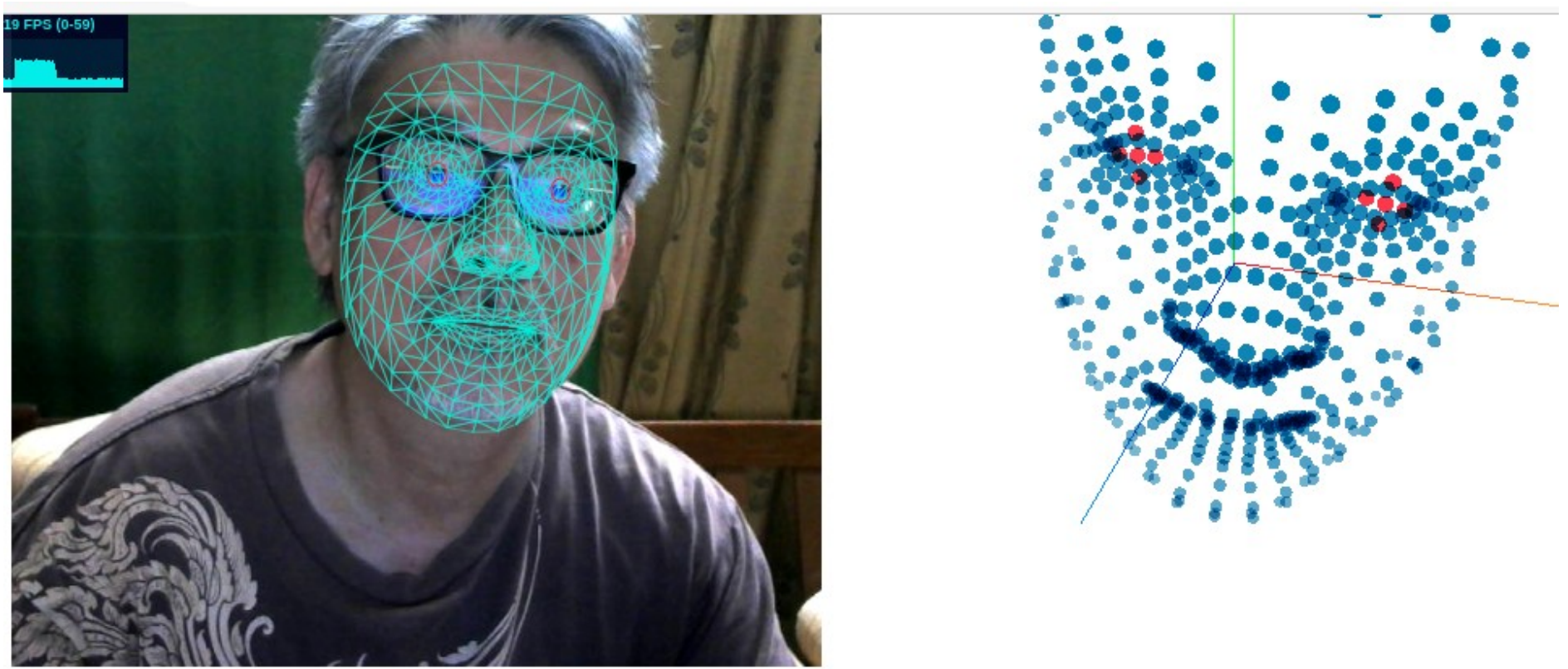
Ex. Object Detection



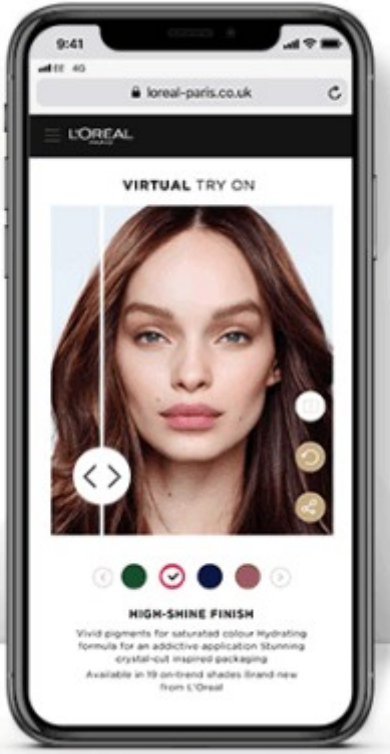
Ex. Pose Detection

Ex. Face Landmarks Detection

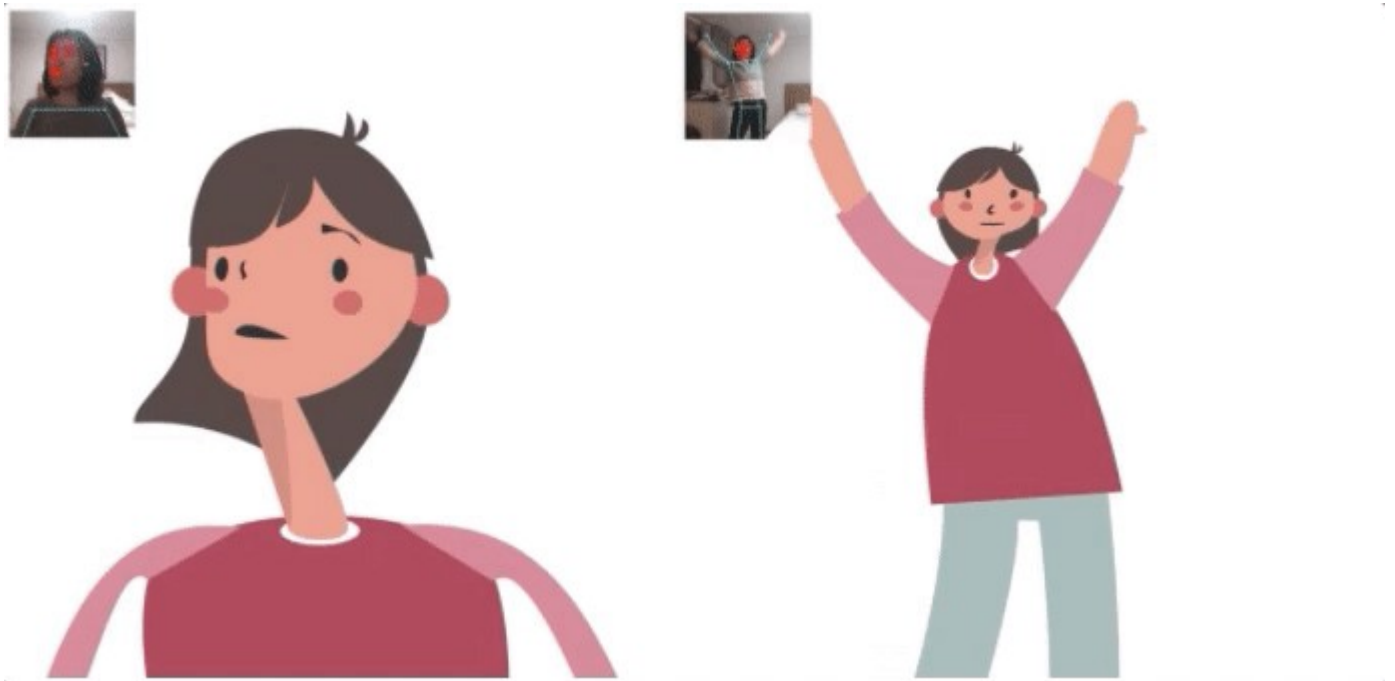
- https://storage.googleapis.com/tfjs-models/demos/facemesh/index.html



Ex. Virtual makeup Application

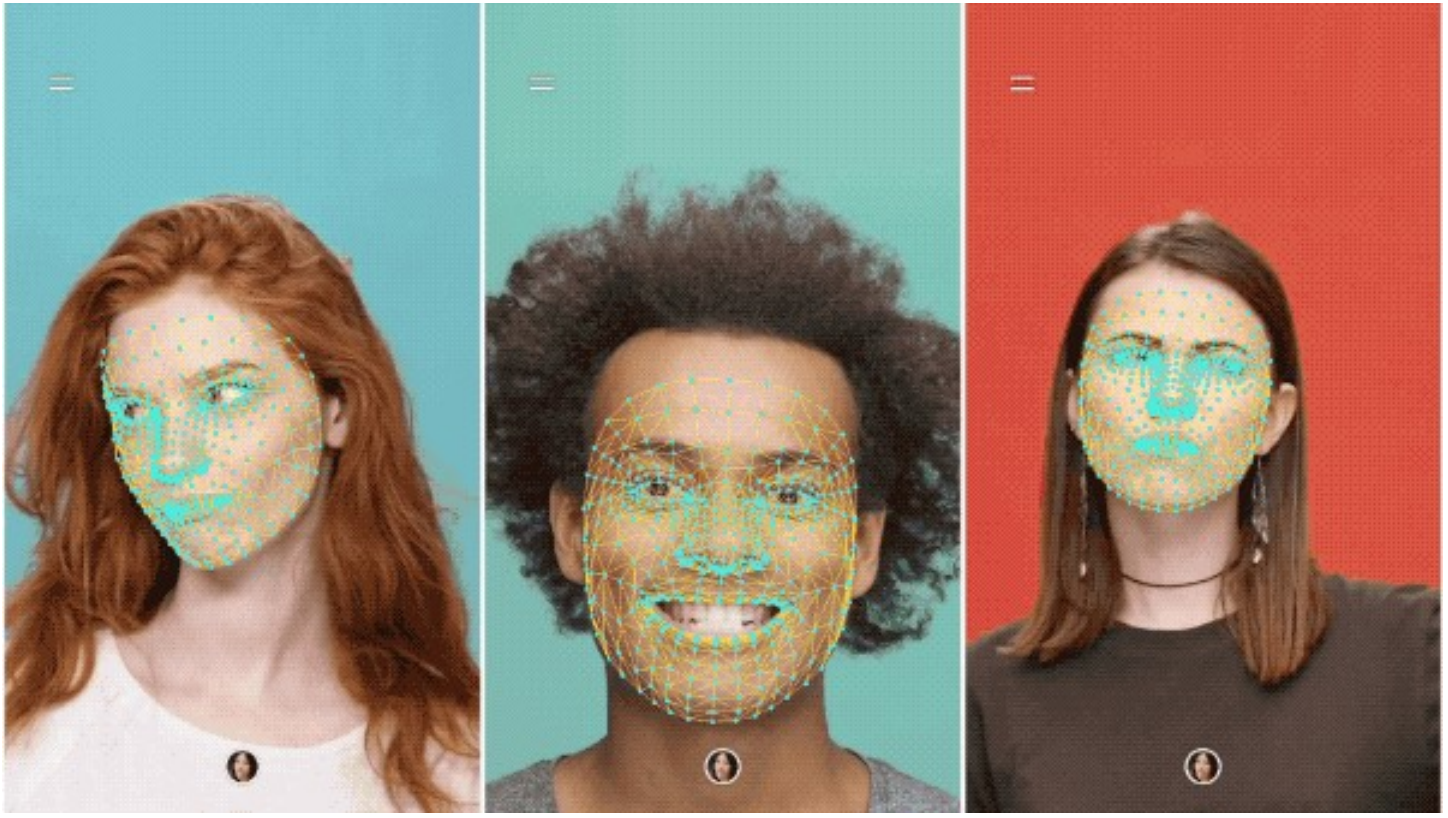


Ex. Face Landmarks & Pose Detection



Ex. Application from SparkAR

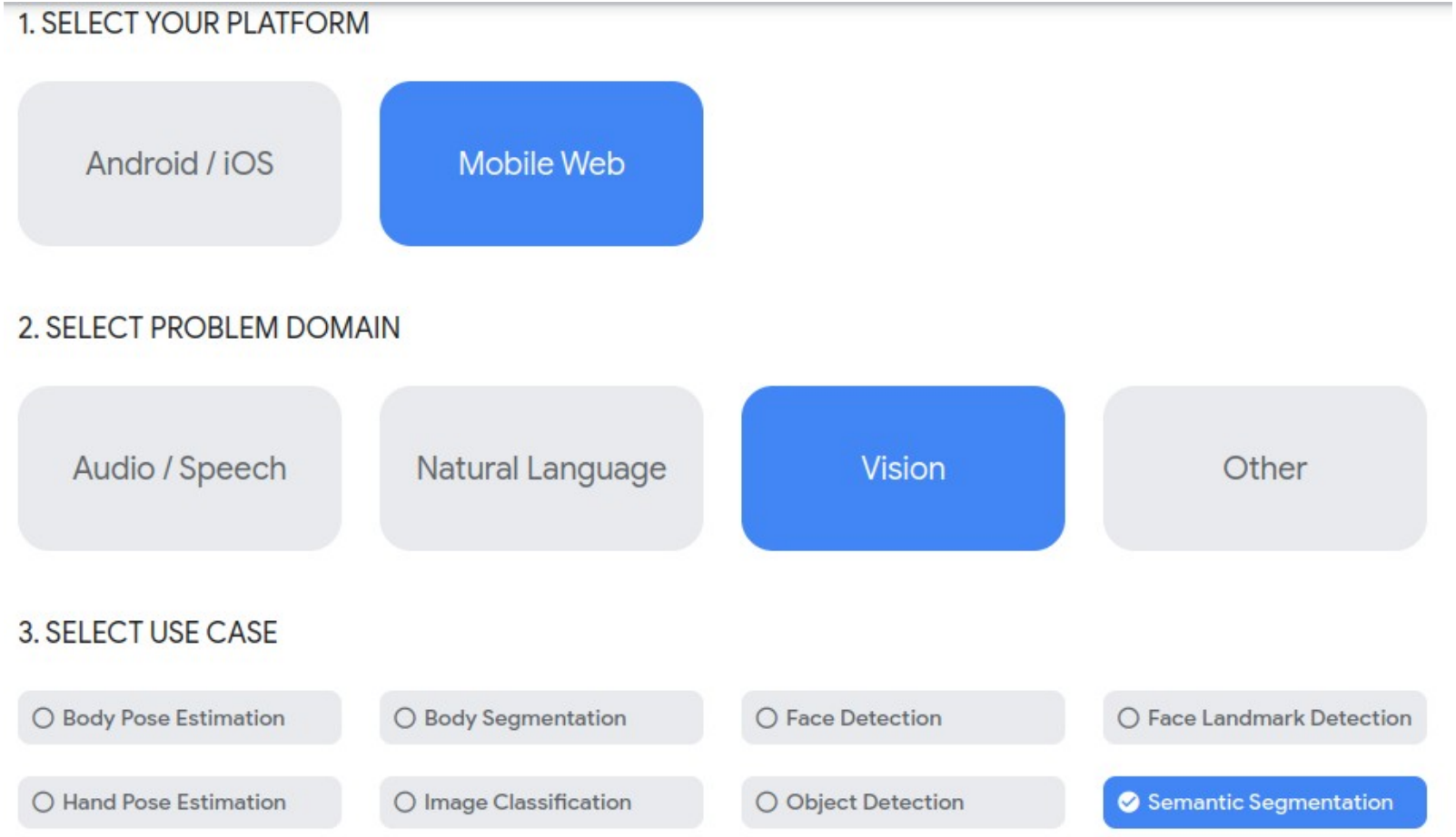
Augmented Reality from SparkAR



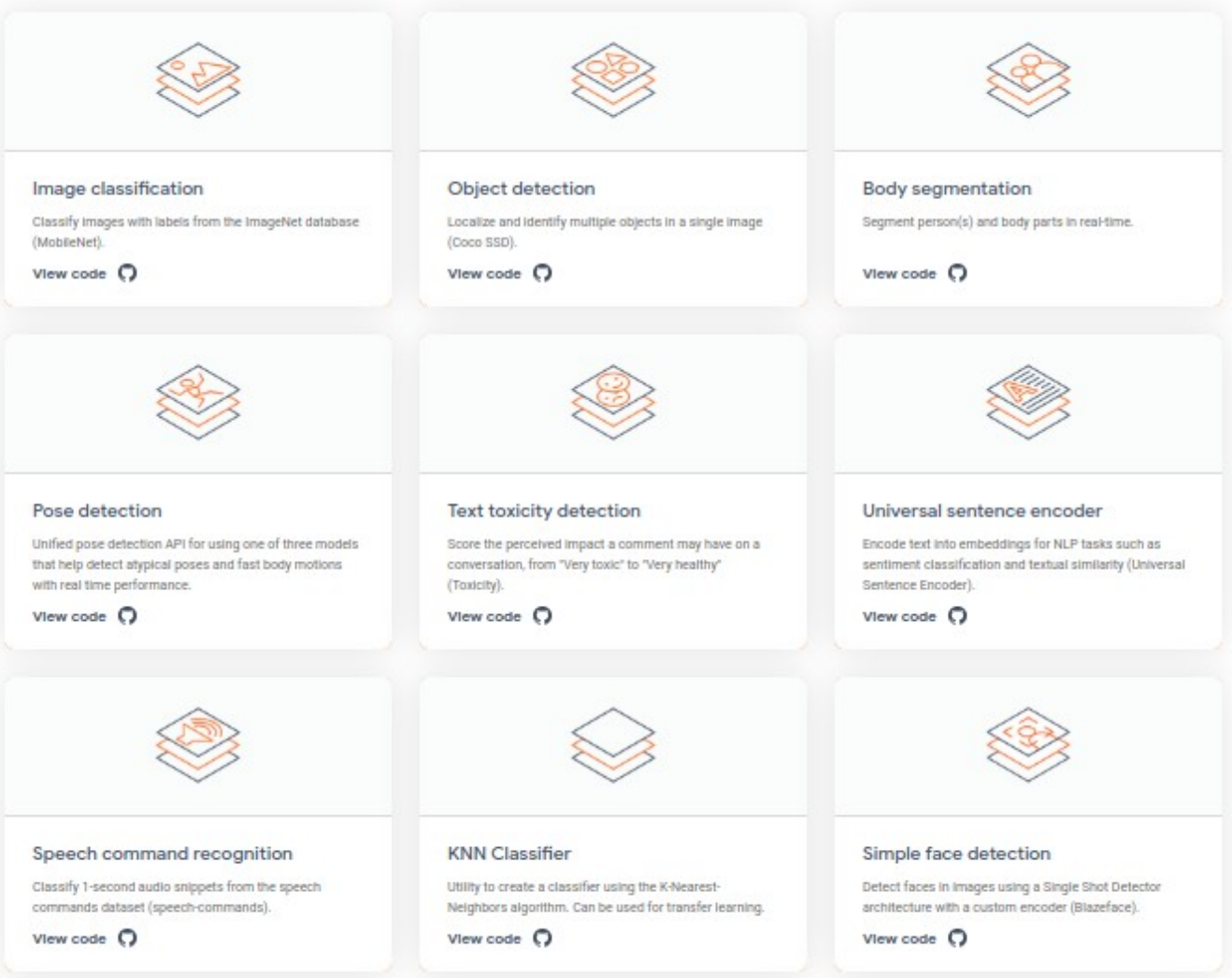
https://youtu.be/RJBWERXeZIM

AR + Mobile Computing

Enhancing Intelligent Mobile App



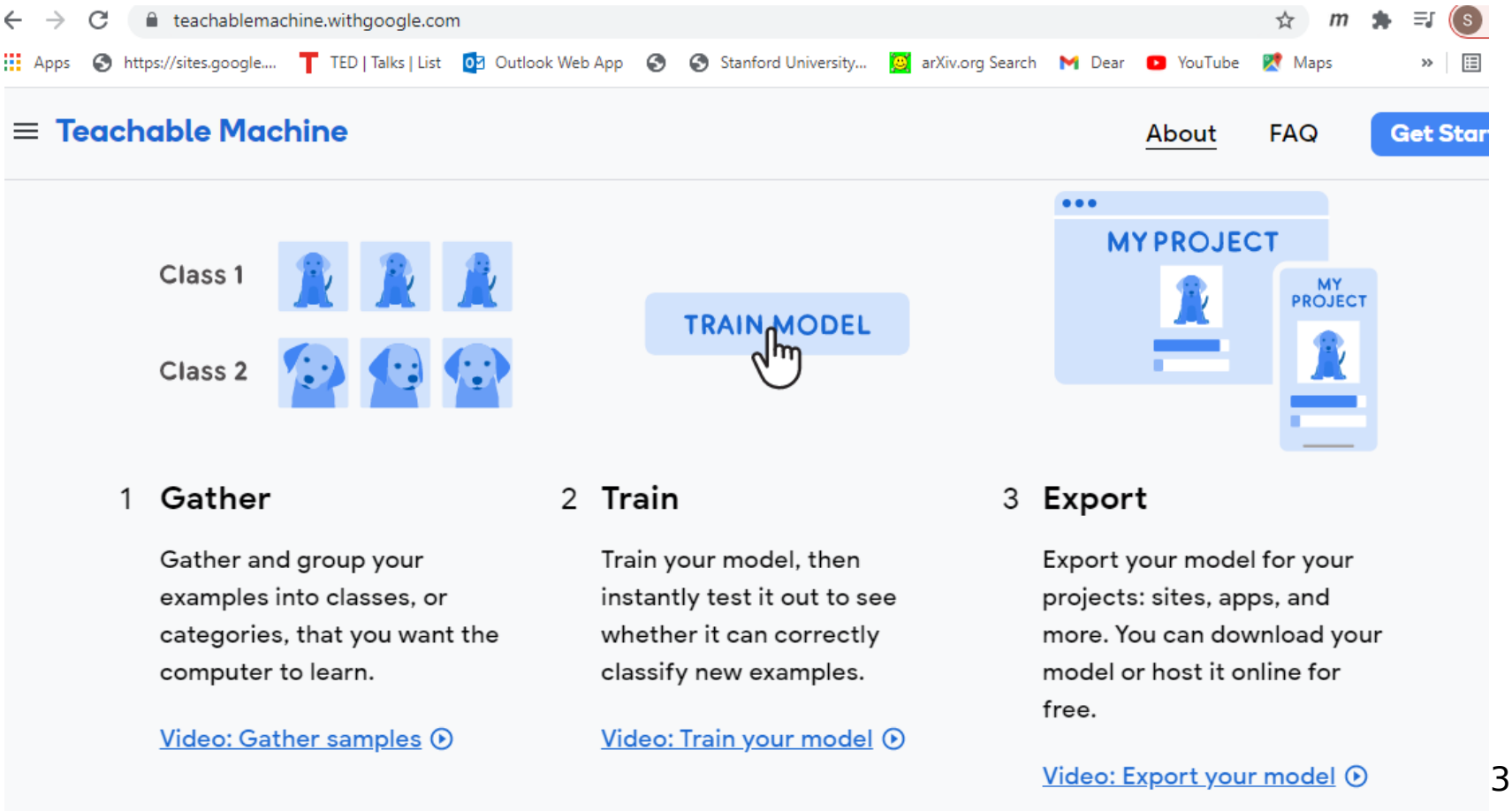
TensorFlow Js Demo



https://www.tensorflow.org/js/models

Teachable Machine

https://teachablemachine.withgoogle.com/



AWS

Advertising & Marketing

Audience Segmentation & Targeting
Real-Time Advertising

More »

Automotive

Connected Mobility
Data Collection
Virtual Showroom

More »

Consumer Packaged Goods

Direct to Consumer eCommerce
Personalization
Supply Chain Planning & Visibility

More »

Financial Services

Fintech Blueprint on the AWS Cloud
SWIFT Client Connectivity on AWS

Game Tech

Game Infrastructure for Session-Based Games
Game Services
Workstations

More »

Healthcare, Life Sciences, and Genomics

Clinical Information Systems
Interoperability
Tertiary Analysis & ML

More »

Manufacturing & Industrial

Computer Aided Engineering
Industrial Data Platform
Maintenance & Asset Optimization

More »

Media & Entertainment

Cloud Editing
Machine Learning-Generated Content Insights
Video Streaming

More »

Retail

Warehouse Management
Traditional POS Checkout
Web Store

More »

Travel & Hospitality

Contact Center Modernization
Modernization for Systems & Solutions
Single View of the Traveler/Guest

More »

Public Sector

Digital Services, Code, and Data
Emergency Responses

Cross-Industry

Commercial Revenue Planning
Demand Planning
Knowledge Management

More »

Azure

Select a category:

- AI + machine learning
- Analytics
- Compute
- Containers
- Databases
- Developer tools
- DevOps
- Hybrid + multicloud
- Identity
- Integration
- Internet of Things
- Management and governance
- Media
- Migration
- Mixed reality
- Mobile
- Networking

AI + machine learning

Create the next generation of applications using artificial intelligence capabilities for any developer and any scenario

Learn more

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AI / machine learning	Analytics	Automation
Blockchain	Compute	Containers
Databases	Developer tools	Integration
Internet of things	Logging and monitoring	Networking

Q & A

- End of this lecture