

PROJECT **MAYYA**

The computer vision, deep learning, 2D/3D graphic capturing and rendering, processing capacity, and real-time contextual information enable for user to discover the world more open and help to connect around you immersively.

Project **MAYA 1.0**

July 2016

Make Camera as a Real-World Browser : **Capture, Search, Result**

MAYA

Computer Vision & Deep Learning based
Vision Intelligence Framework.



AR Camera



AR Gallery

Enable native & 3rd party AR Apps run
within Camera Intelligent Vision Memory

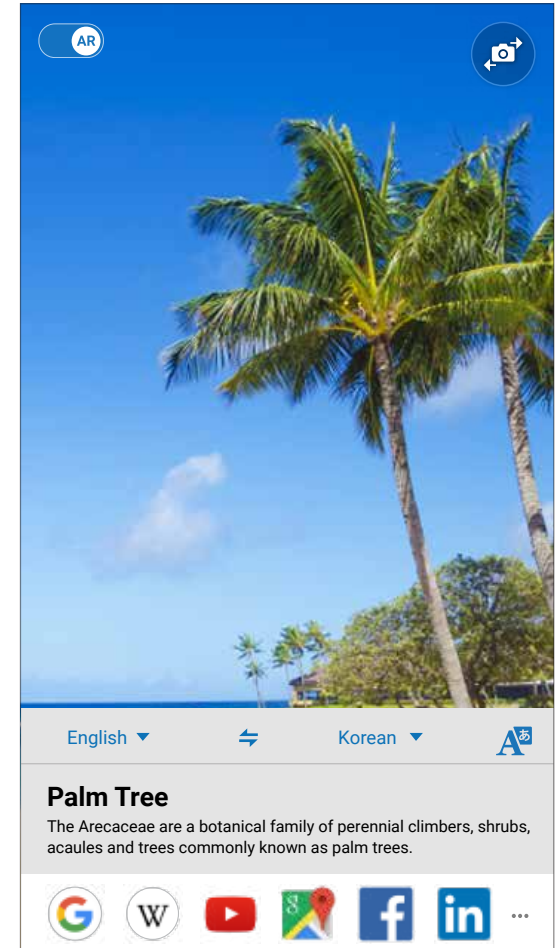
AR Camera User Flow



Open Camera App



Turn On AR Mode & Recognize Object



Recognition Result

AR Camera Mode



Samsung Modes (Default)

3rd Party Modes (Downloadable)

AR Camera Samsung Modes



OBJECT



SCENE



FACE



GESTURE



TEXT



PATTERN



MEDIA



PLACE



LANDMARK

AR Camera 3rd Party Modes (Example App)



NAT GEO



CARMAX



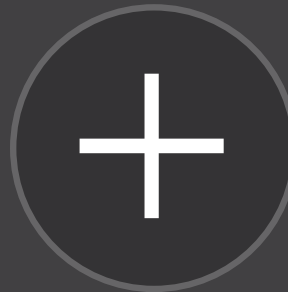
MACDONALD



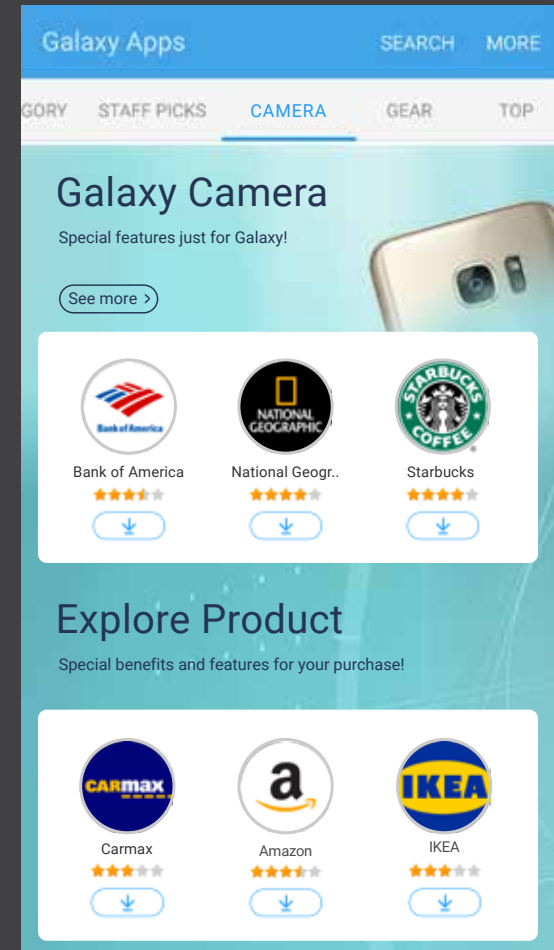
AMAZON



STARBUCKS



DOWNLOAD



AR App Eco-system
(Download from Galaxy App Store :
New 'Camera' Section)

AR Camera Object Mode

On-device 1000 Object categories recognition and 94% accuracy



Open Camera App



Select Object Mode



Recognition Result with Translation Feature & Relative Links

AR Camera Landmark Mode

Deep-learning based landmark & place recognition



Open Camera App



Select Landmark Mode



Landmark and Place Recognition Result with Translation Feature & Relative Links

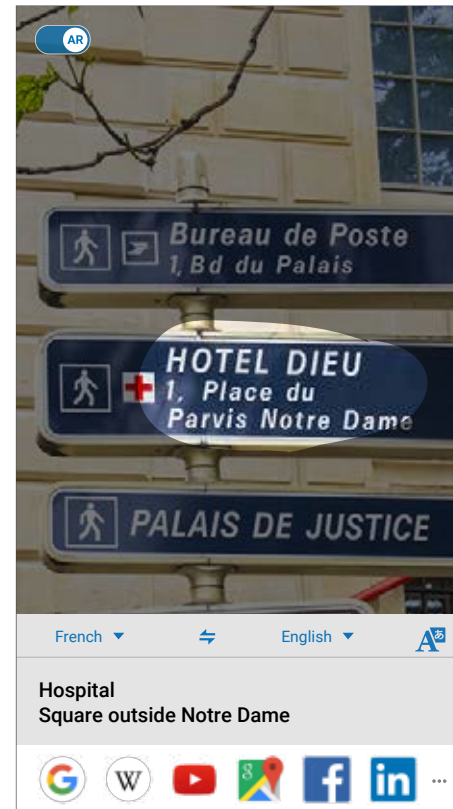
AR Camera Text Mode



Open Camera App



Select Text Mode



Auto Language
Recognition &
translation

AR Camera CARMAX (Example)

400+ car categories recognition



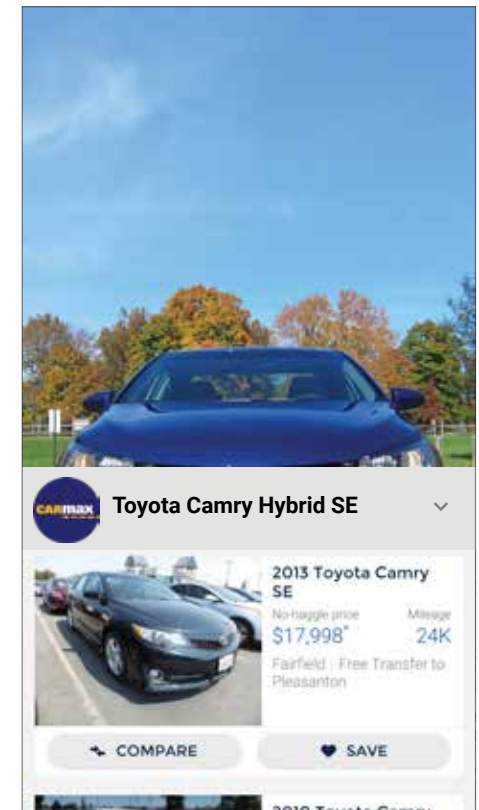
Open Camera App



Select CARMAX Mode



Recognition Result with Relative Links for Detail



Open CARMAX App for Search Detail

AR Camera NatGeo (Example)

300+ animal categories recognition



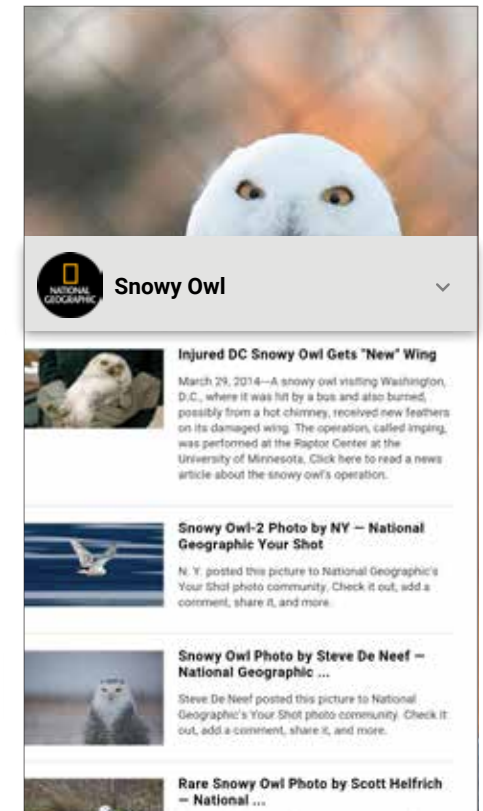
Open Camera App



Select NatGeo Mode



Recognition Result with Relative Links for Detail



Open NatGeo App for Search Detail

AR Camera Amazon (Example)

200+ office/general object recognition



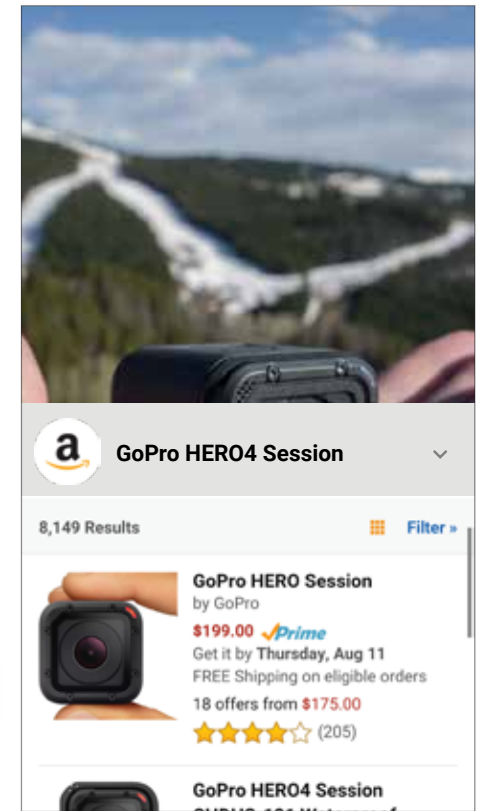
Open Camera App



Select Amazon Mode



Recognition Result with Relative Links for Detail



Open Amazon App for Search Detail

AR Gallery User Flow

Recognition Model:



Place



Object



Landmark



Text



Scene



Person

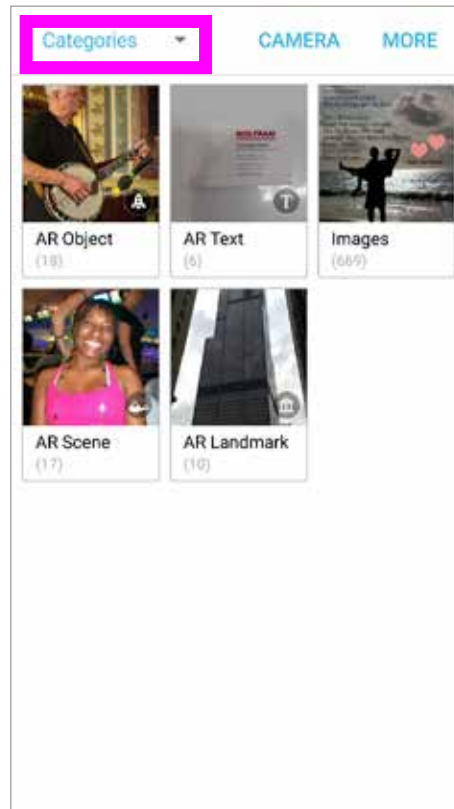
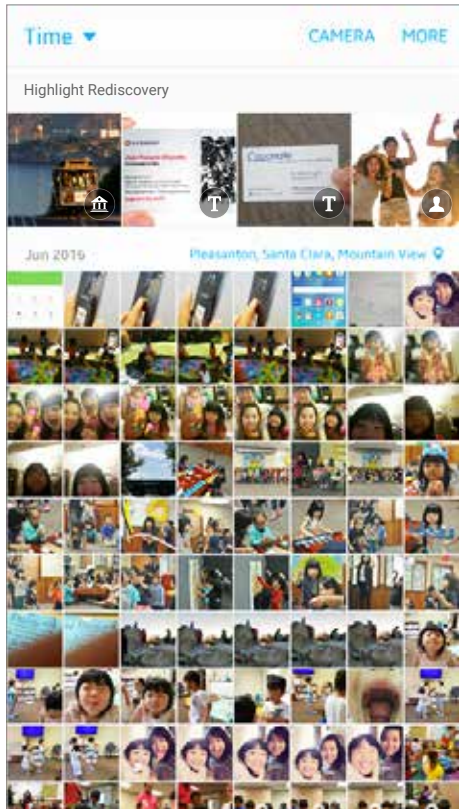
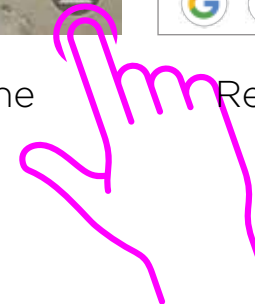


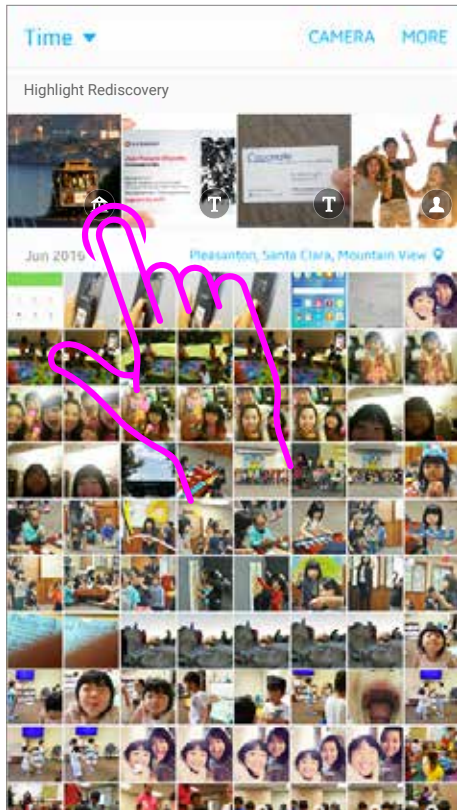
Photo Gallery :
Highlighted Area for AR Photo

AR Category in
Gallery App

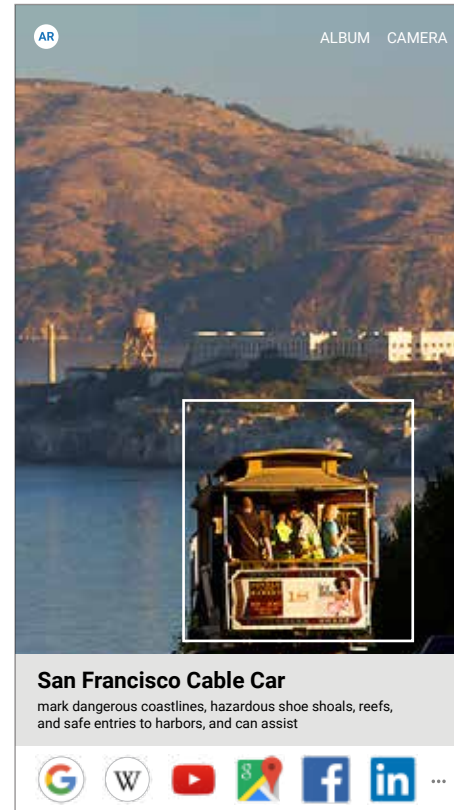
Process Offline Recognition Result



AR Gallery Object/Landmark Recognition



Represented Icon for Information

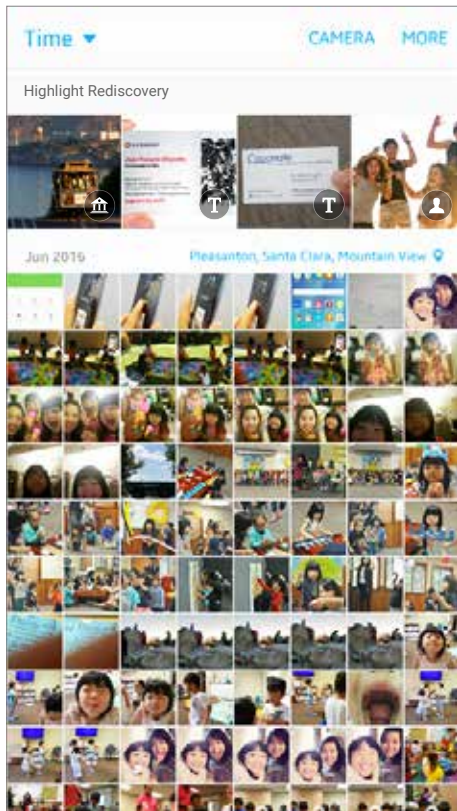


Object Recognition Result

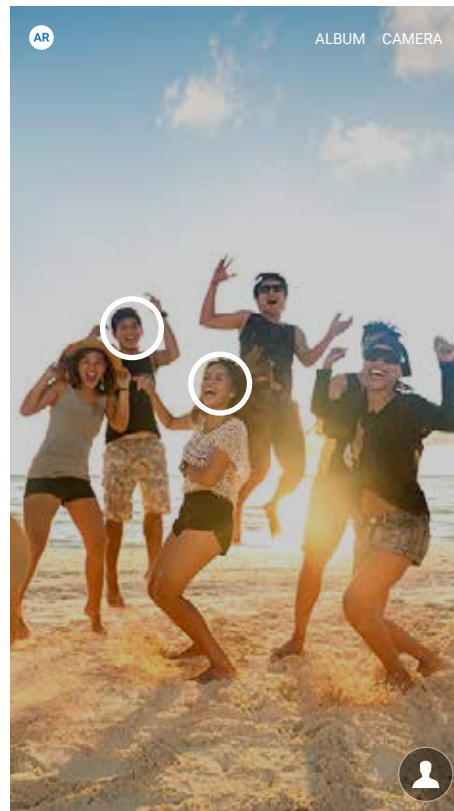


Landmark Recognition Result

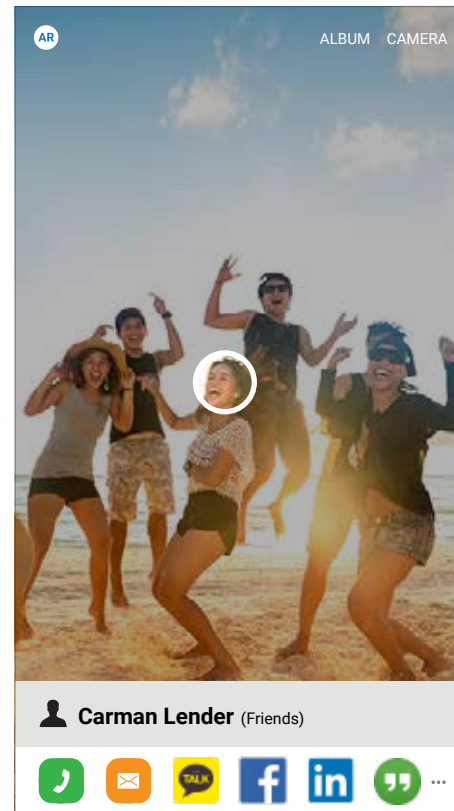
AR Gallery Face Recognition



Gallery App

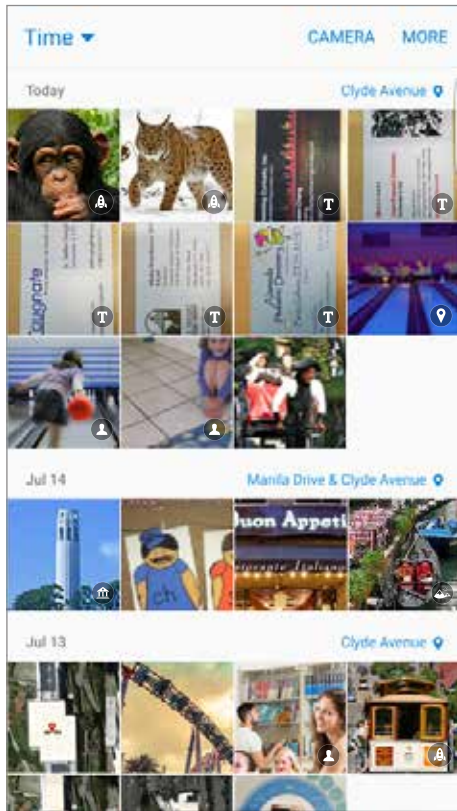


Face Recognition :
Based on Contact List
& User Tagging



Face Result &
Relative Links for further
action

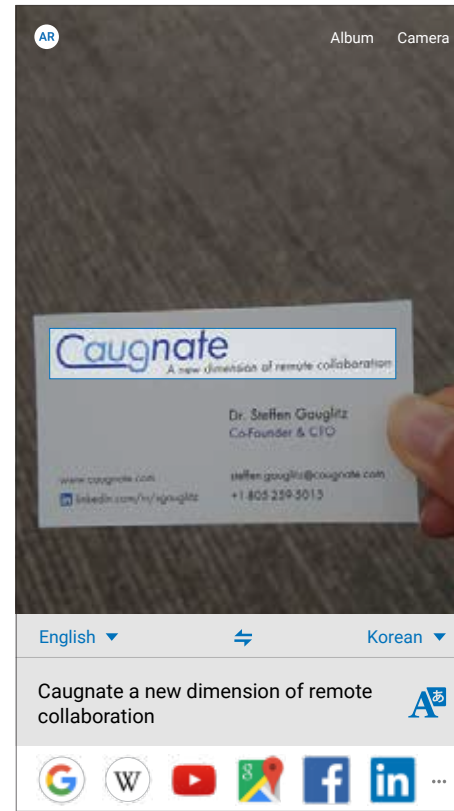
AR Gallery Text Recognition



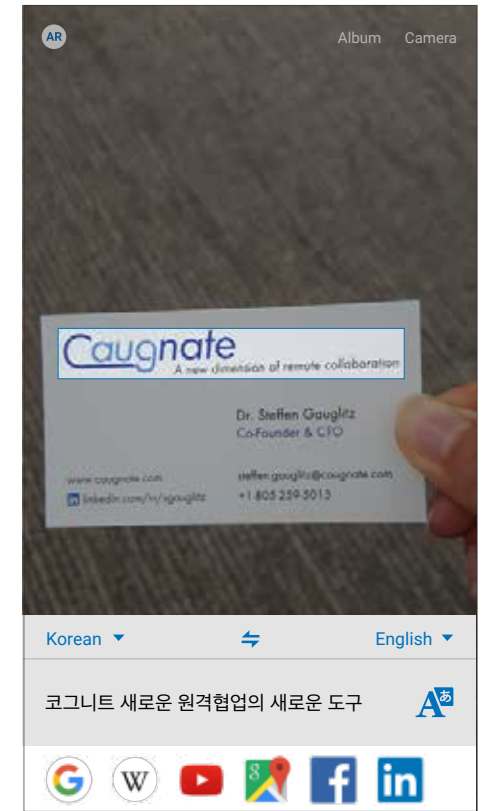
Gallery App



Text Recognition



Detect Language on Selected area



Translation to Multi-languages

Make Camera as Visual Assistant : **Capture, Search, Result + Explore**

Unlock new service experience including simplified user interface, understand the context of user and offer the user most appropriate and convenient suggestions and recommendations.



Visual Assistant Launcher Icon

Vision & layers concept are integrated into iconic eye imagery, and the color represents Samsung like and robotic or machine look and feel

Visual Assistant Sketches



Visual Assistant Modes

Samsung Mode (Default)

MagicLens: Object, Scene, Text, Bar Code

Text: Text, Bar Code

Media: 2D Image, Text, QR Code

Sign: Face Expression, Hand/Body Gesture

Location: Compass, Landmark

3rd party Mode (Downloadable)

Download: 3rd Party Layers,

Samsung Sub-features,



MagicLens



Text



Media



Sign

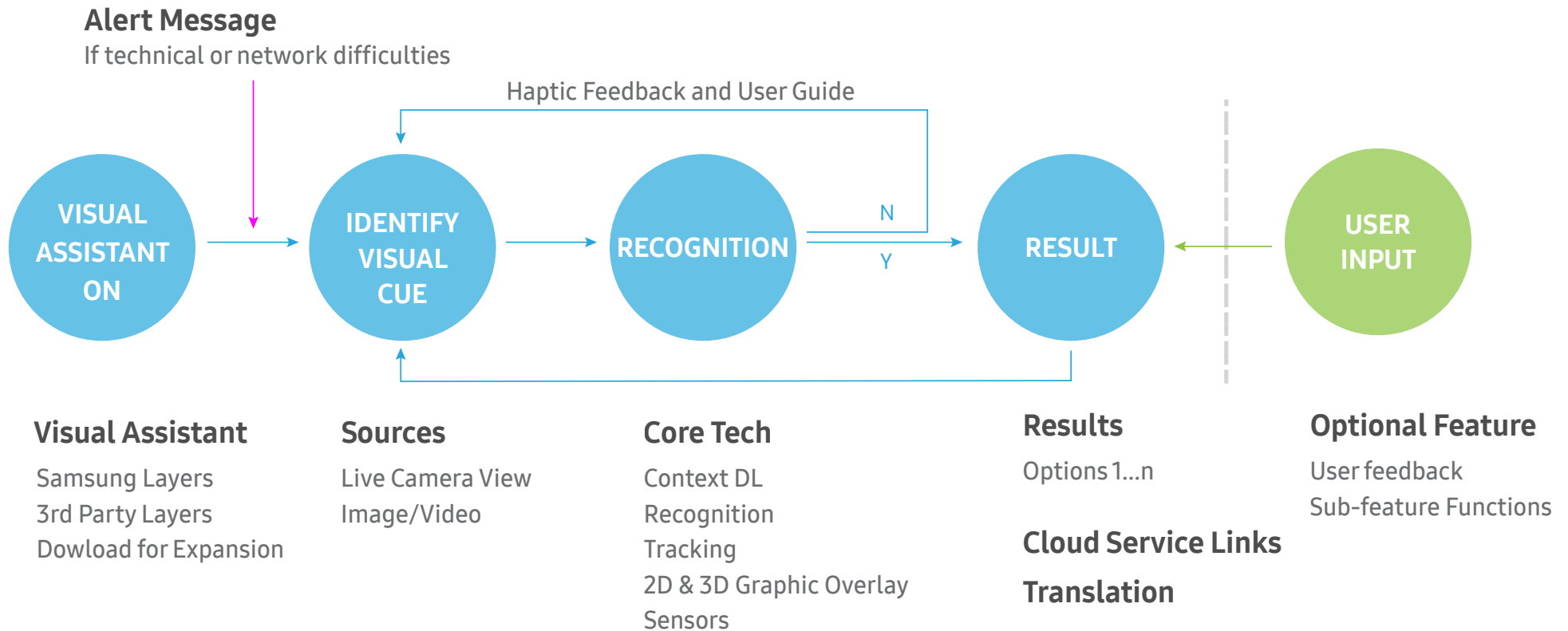


Location



Download

Visual Assistant Primary Flow



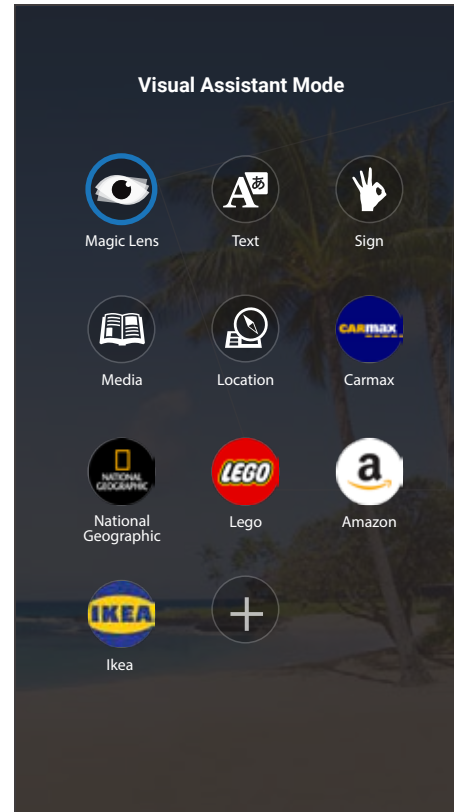
Visual Assistant Main Interface



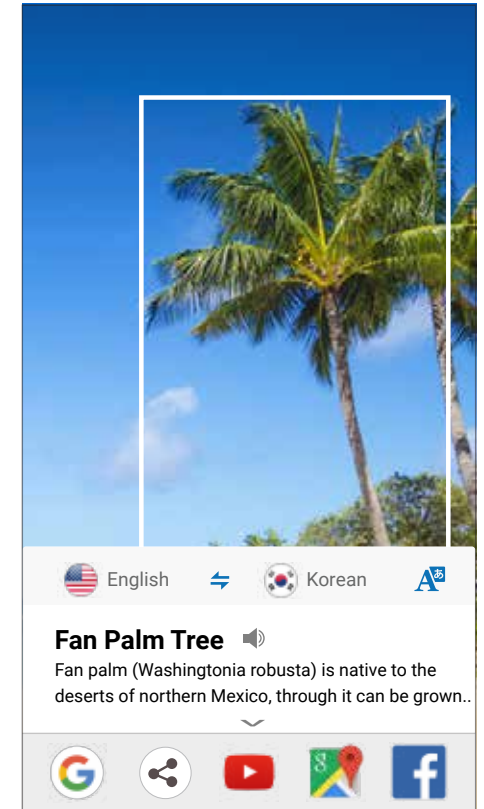
Camera App



Visual Assistant On



Mode Selection

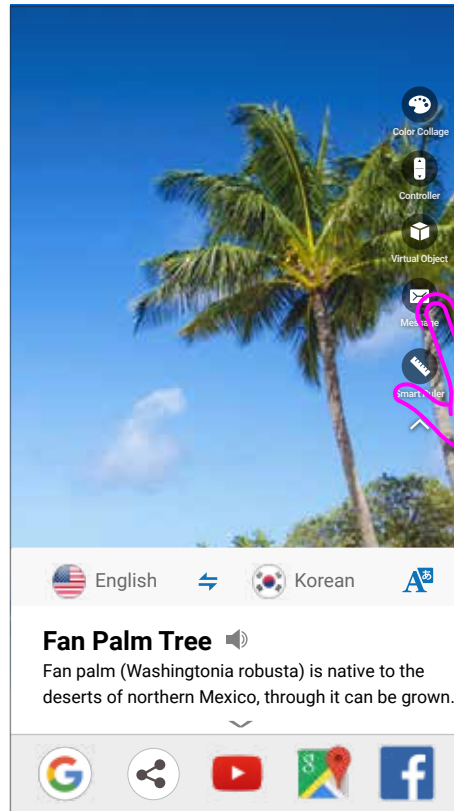


Recognition Result

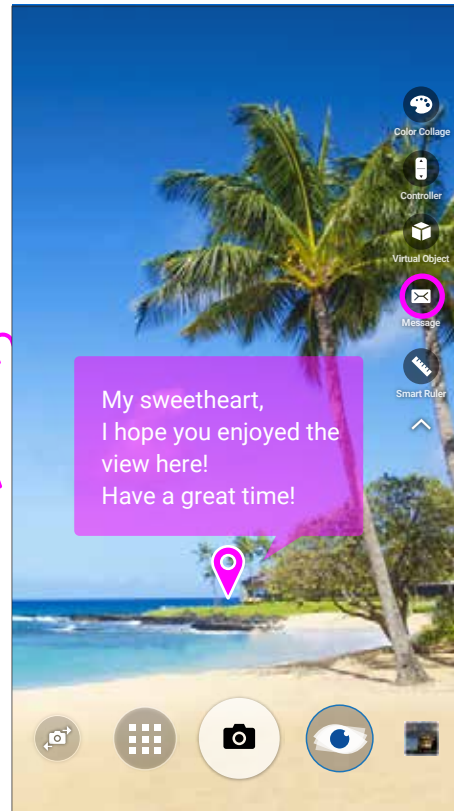
Visual Assistant Interface for add-on feature



Visual Assistant On



Result & Sub Features



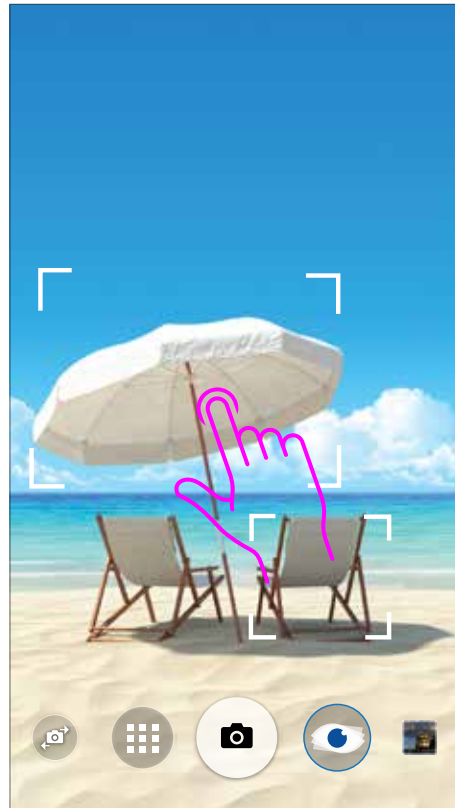
Sub Function Manipulation

Visual Assistant Identify & Select Variations

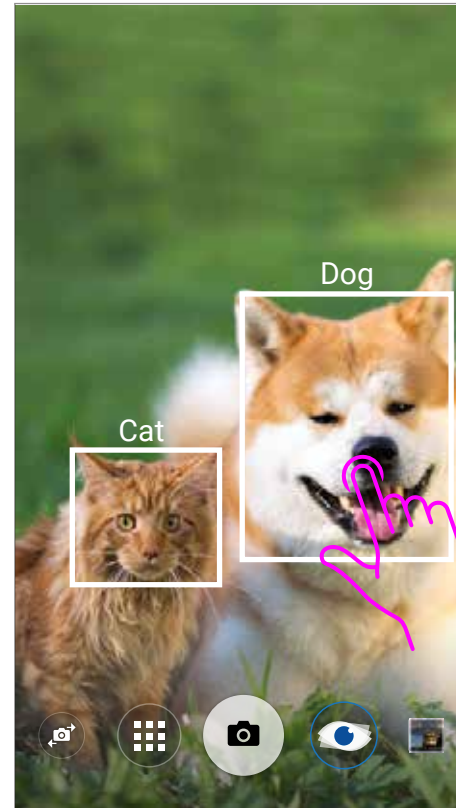
Multi Recognition & Selection (Option 1)



Manual Tag or Label

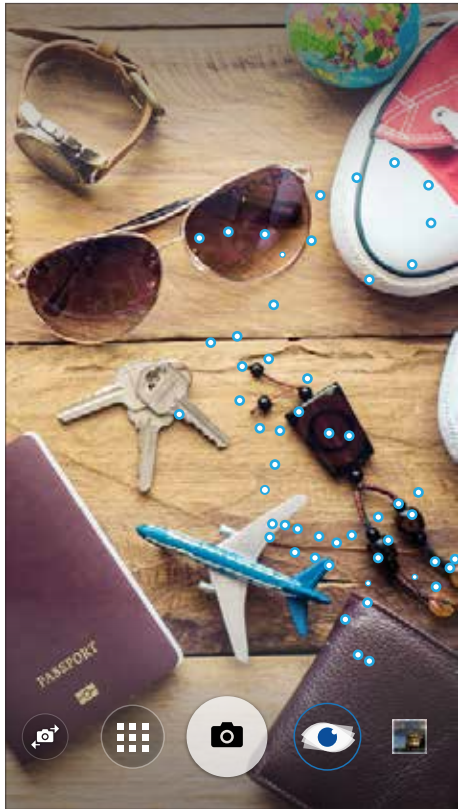


Bounding Box



Both Bounding Box
& Tag

Auto Identifying- No Selection (Option 2)



Auto Blinking Dots

Selection by Hand Drawing (Option3)

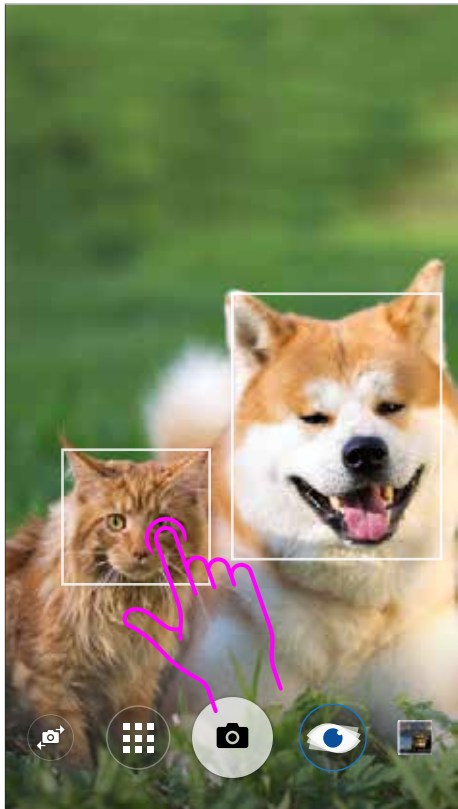


Manual Drawing

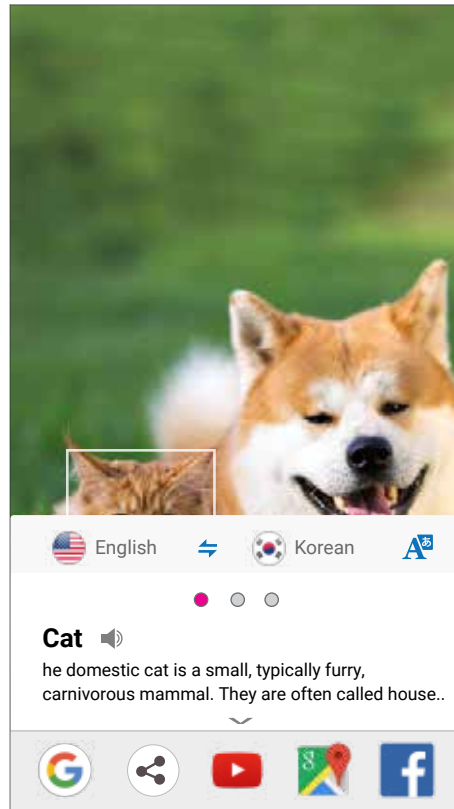
Visual Assistant Result Interface Variations

Option 1

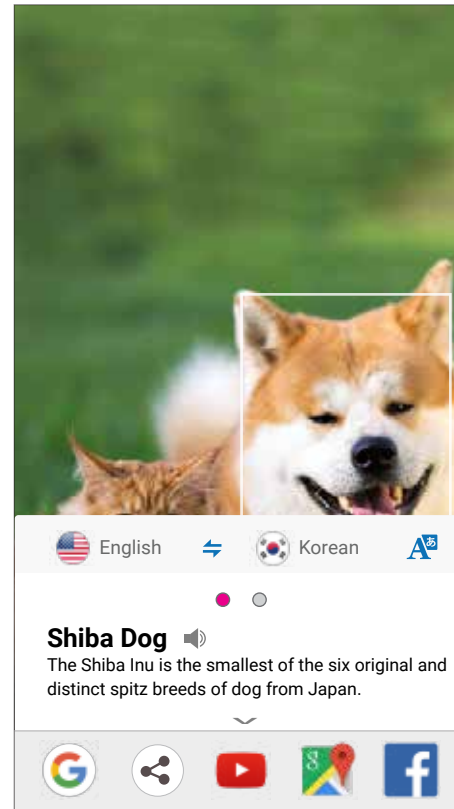
Recognition Result per User Selection



Multi Recognition



Result per Selection



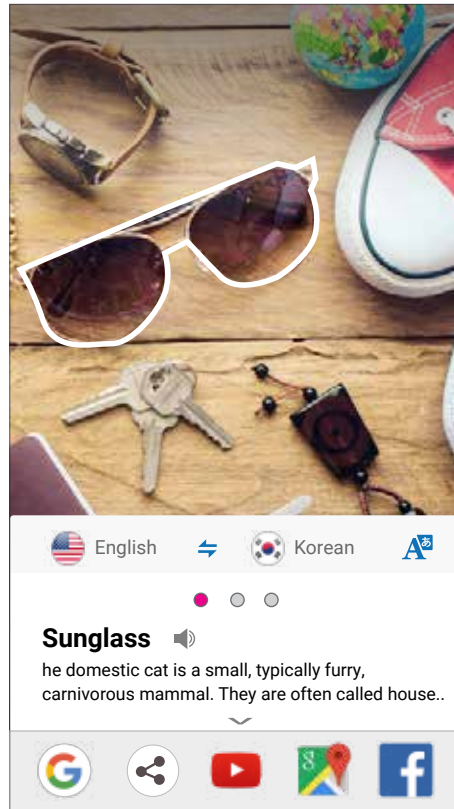
Option 2

Recognition Result with Indicator

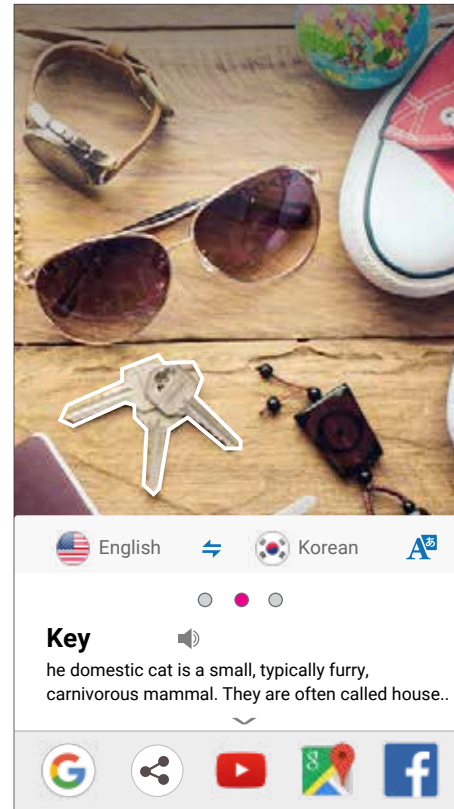
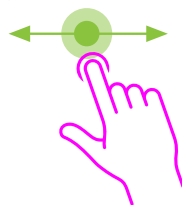
- Auto searching and identifying on screen items without user selection
- Result comes along with indicator simultaneously on the screen



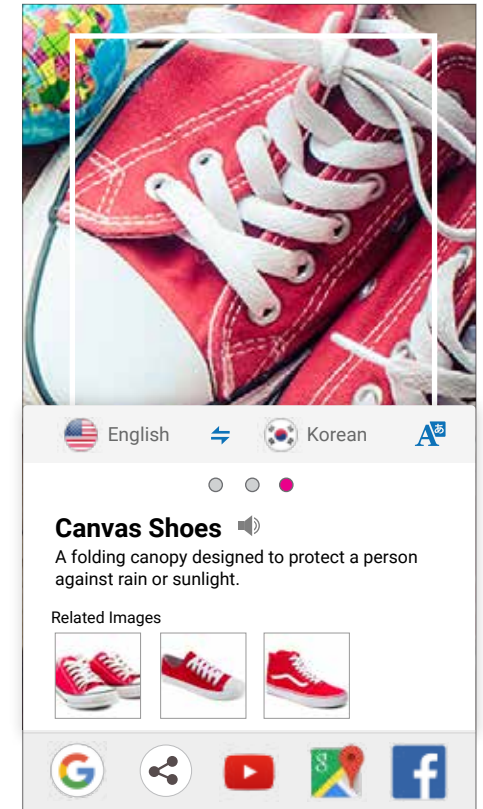
Auto Identifying
& Recognition



Result with Indicator,
Swiping for Next Result



Second Result with
Item Indicator, Swipe up
for more Detail



Expanded Result Card

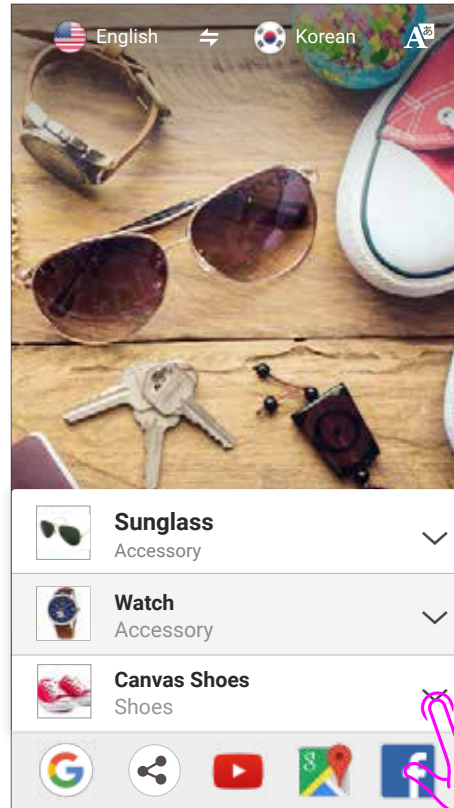
Option 3

Recognition Result with Relative Image

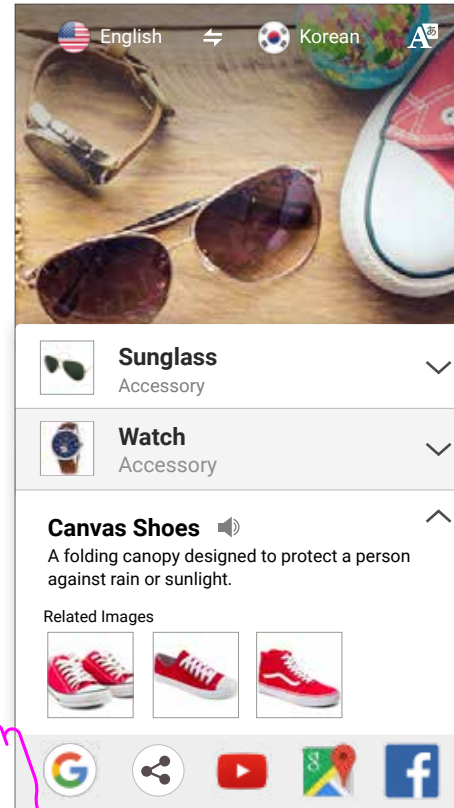
- Multi recognized results at a glance
- Vertical expanding for each result



Detecting Process



Multi Results with Image



Extend for Detail

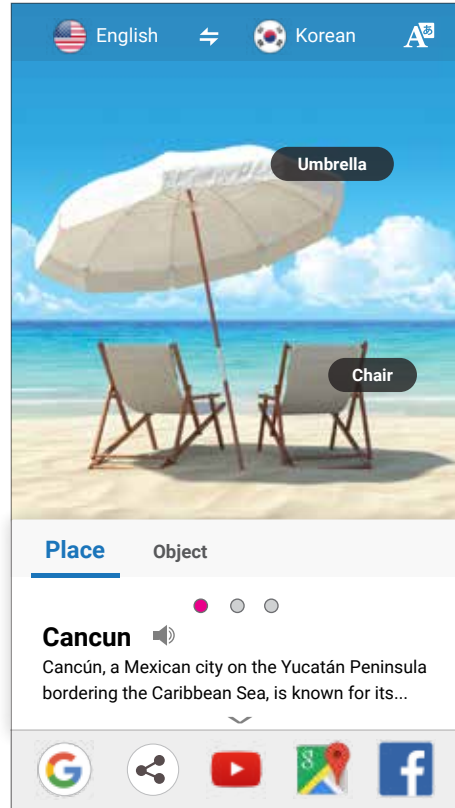
Option 4

Class Categorized Result

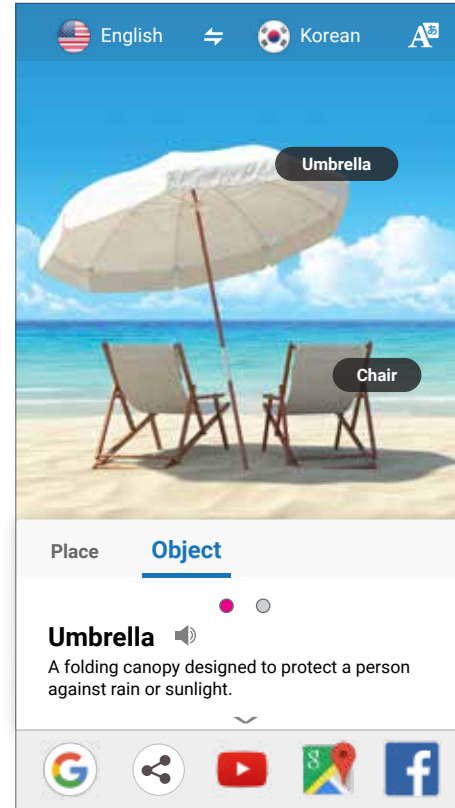
- Sorted Result by Class Category



Detecting Process



Sort Results by Category



Visual Assistant Add-on Features: MagicLens

Add-on Features: MagicLens?

Based on recognition, contextually provide related additional features/ functions which can be edited by usercontrol. And 3rd party features are downloadable in Camera App store for extensible usability.

Add-on Feature Scenarios



MAGIC LENS

Object, Scene, Text, Bar Code Recognition

- 3D Color Collage
- Remote Control
- Virtual Object
- Object Message
- Smart Ruler



TEXT

Text and Bar Code Recognition

- Image to Text
- Business card



LOCATION

Compass, Landmark

- Navigation
- Location-based Message
- Historic Landmark
- Location virtual Object



SIGN

Face Expression, Hand/Body Gesture

- Sticker Creation



MEDIA

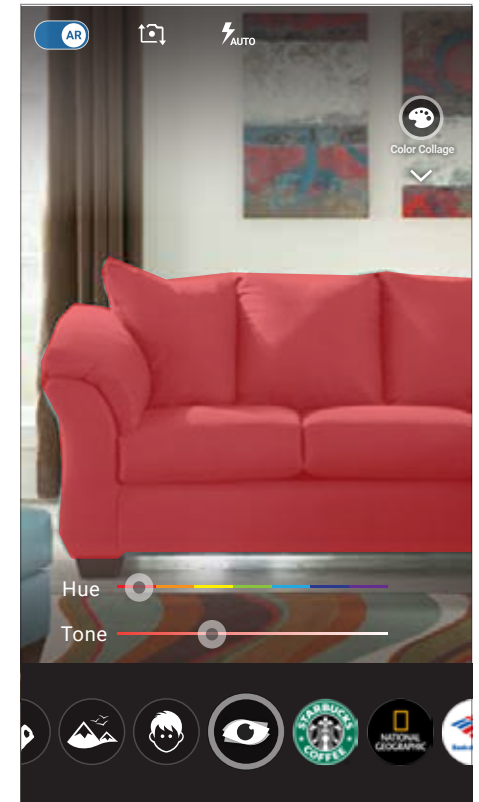
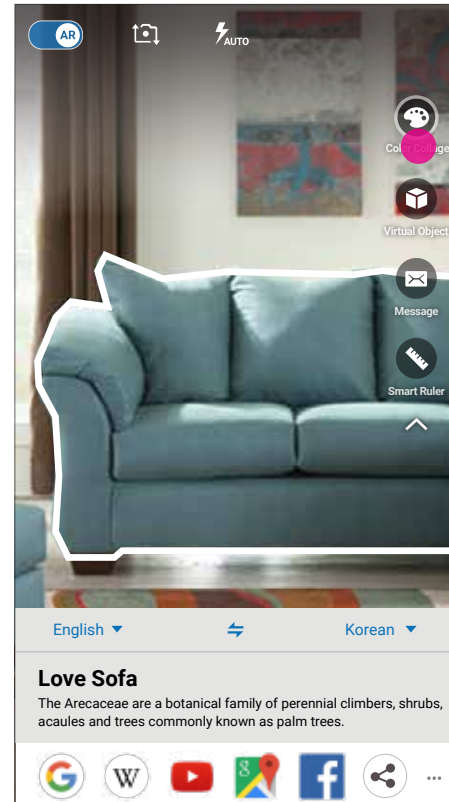
Image, Text, QR Code

- 2D to 3D Reconstruction
- Face Collage
- QR Code

Add-on MagicLens

Color Collage

Provide Segmentation, hue/tone augmentation, photo taking augmented view, image importing in real view for augmenting.



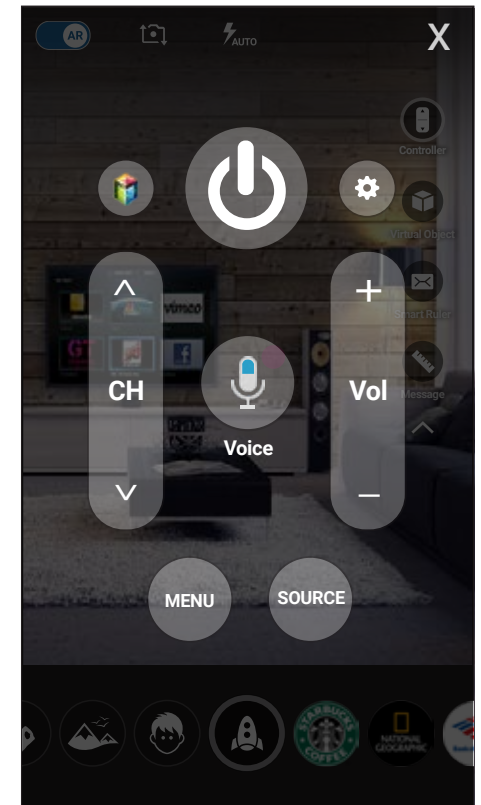
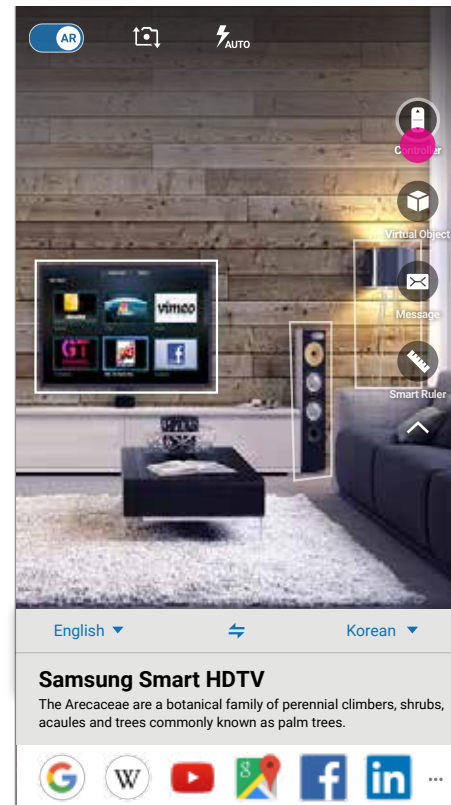
Add-on MagicLens

Remote Control

Provide remote control for electric device- power on/off, volum, light brightness, and etc.

Furthermore, ideally, IoT orchestration setting function.

e.g. set light on and turn TV on



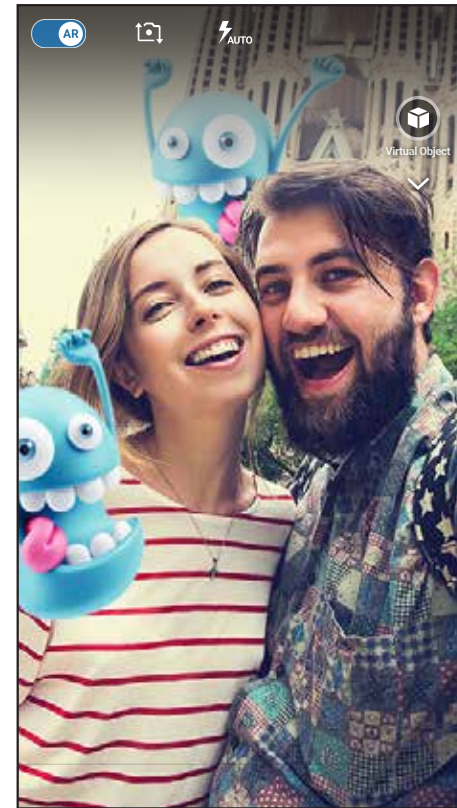
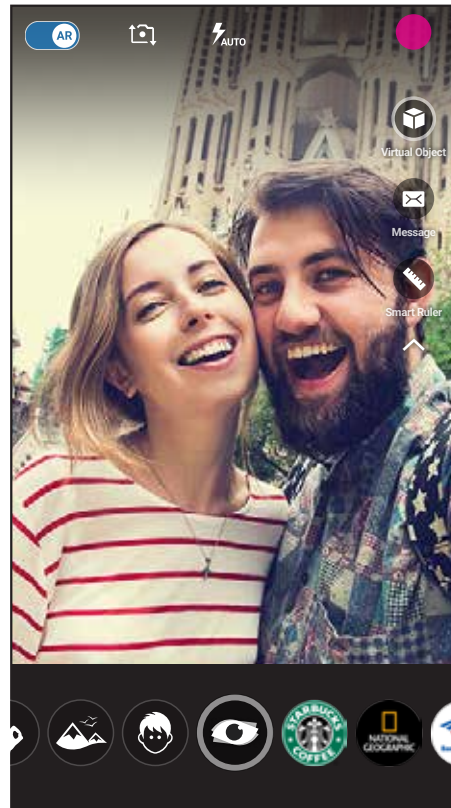
Add-on MagicLens



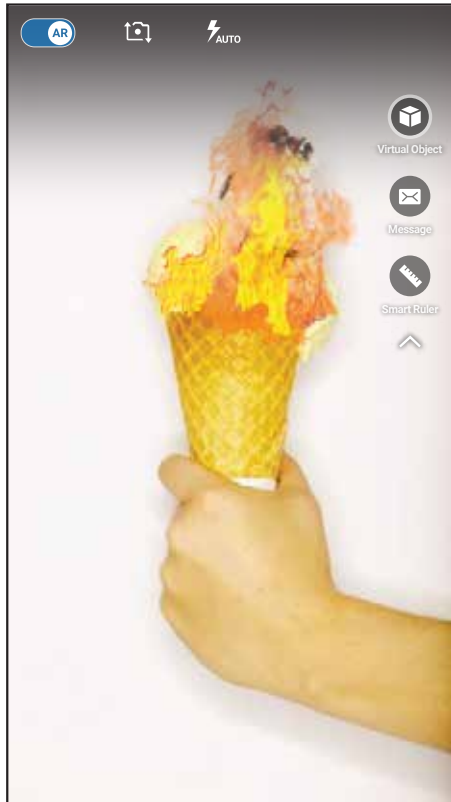
Virtual Object

Augment animated character or background in real view by importing user creation or downloading objects from 3rd party.

- Animated characters or background change
- Effect for Object Advertisement



Front Camera



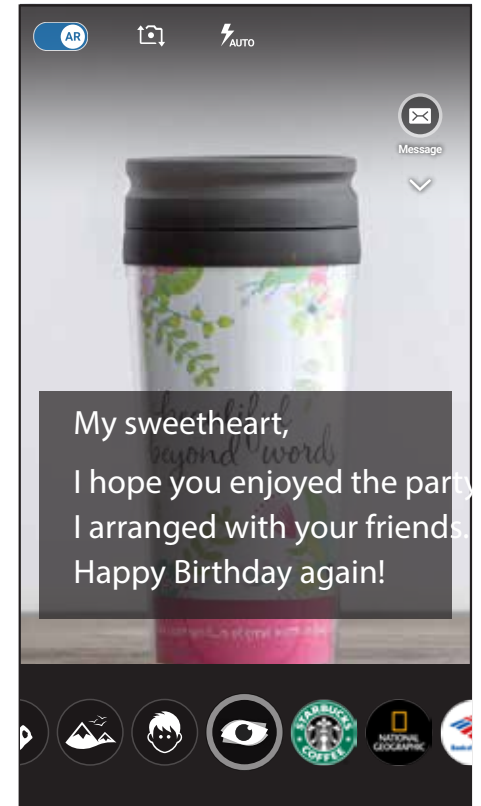
Rear Camera

Add-on MagicLens

Object Message

Create and leave hidden message onto object to be seen by tagged person.

Make your own creative story telling or simple special message for you and your loved one!

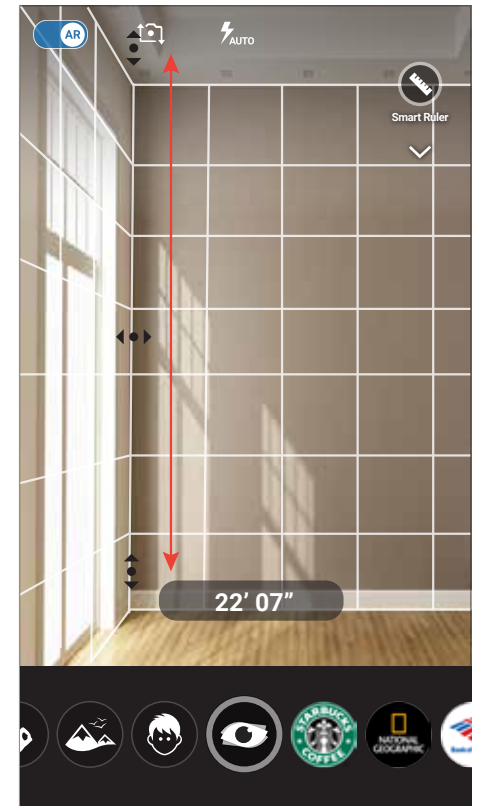
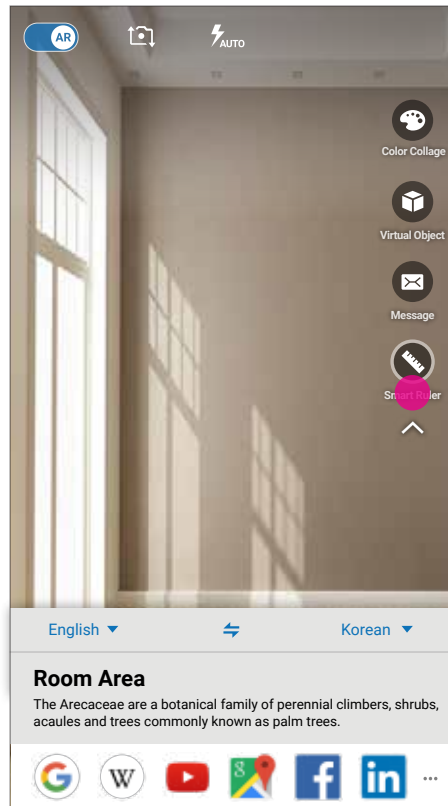


Add-on MagicLens

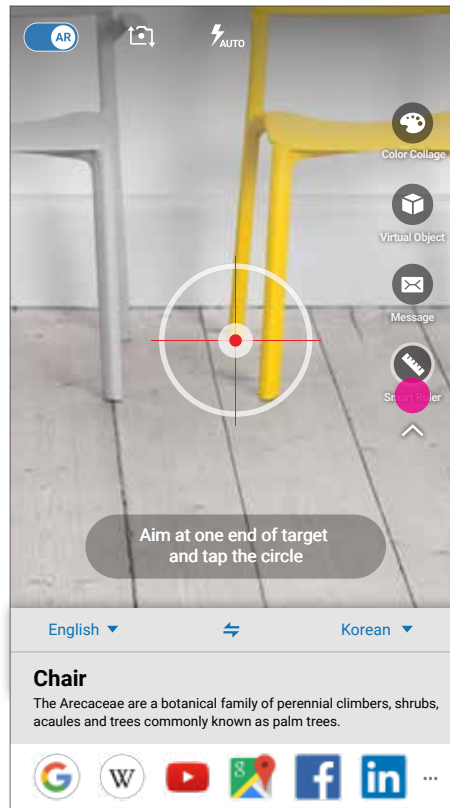


Smart Ruler

Provide standard ruler for measurement:
grid system and point by point
measurement can be used for spatial and
object size measurement.



Grid System Measurement



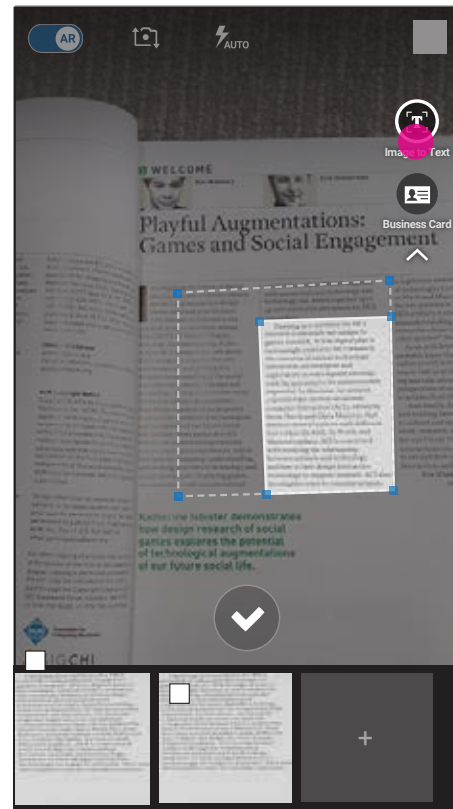
Point to Point Measurement

Add-on MagicLens

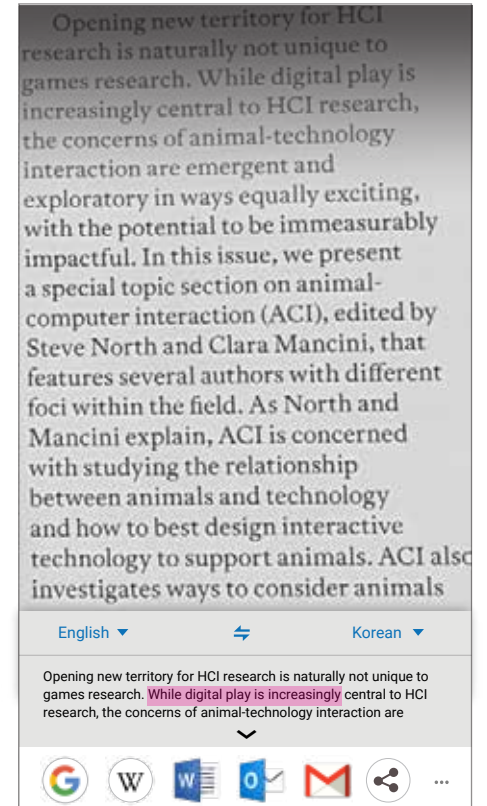


Image to Text

Capture, save as text and export to other application. Multi pages capturing/selection/combining for exporting.



Adjust Detecting Area,
Multi Page Combining

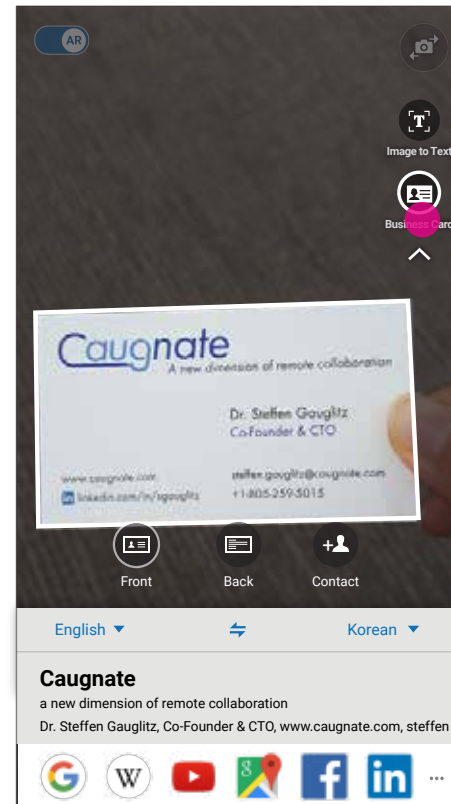


Edit Recognized Text
& Export

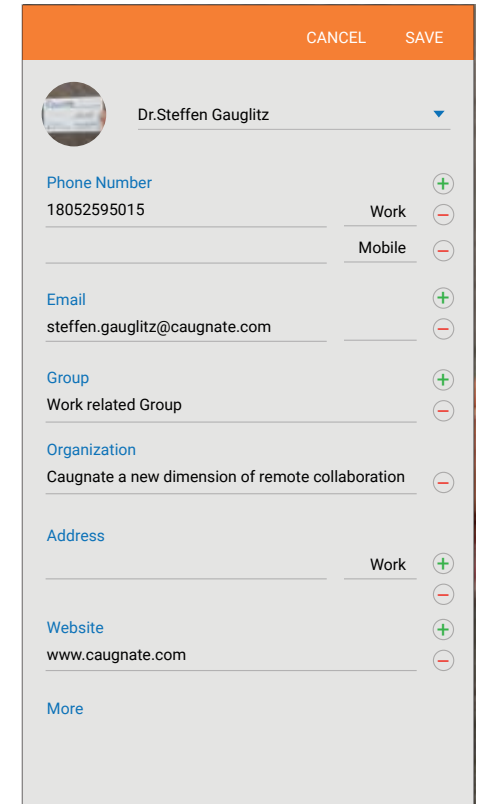
MagicLens

Business Card

Categorize text information of business card and store data in Contacts App



Recognize
Business Card



Sort Contents in Section



Vision