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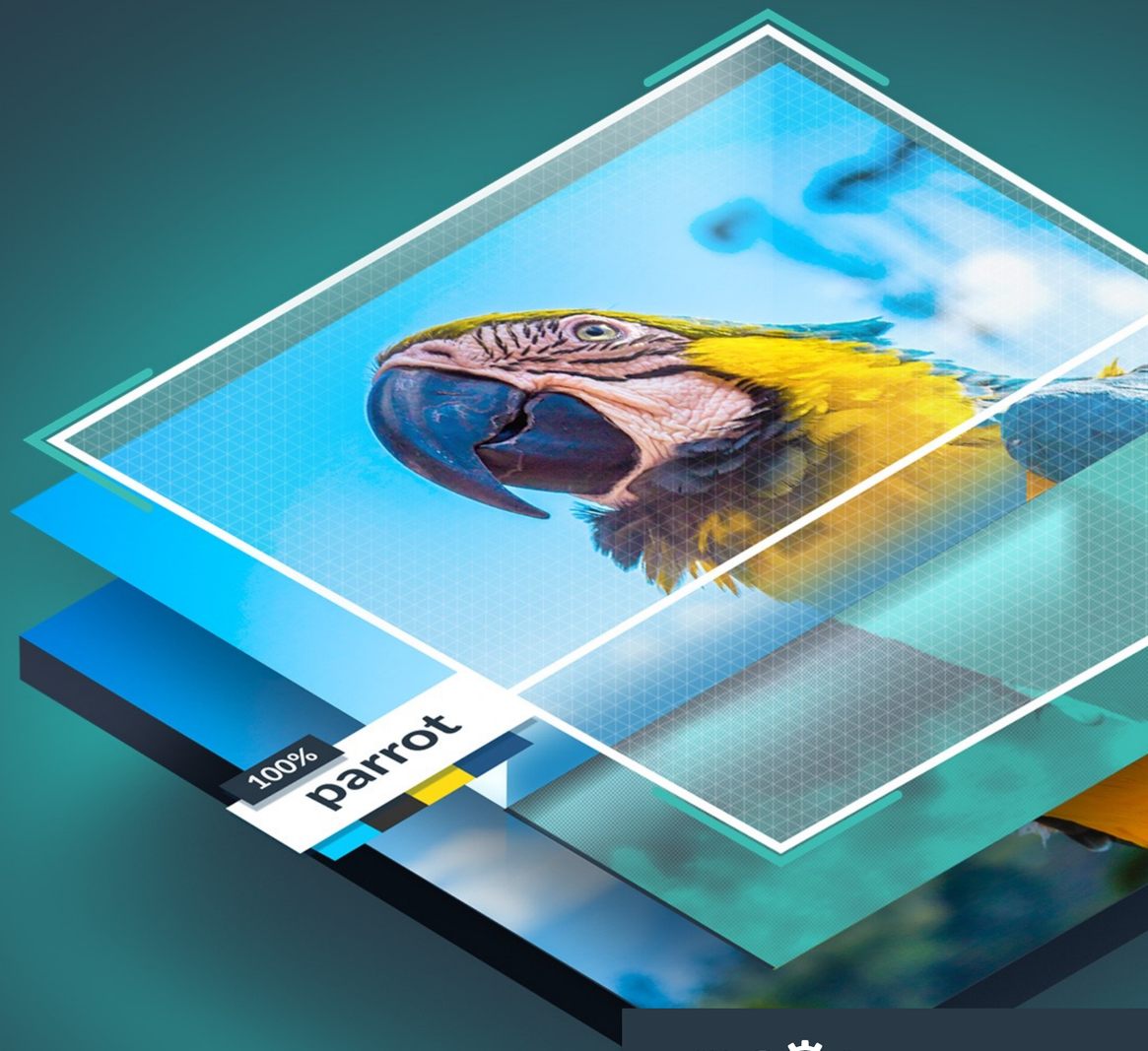
The Practical Evolution of the **Auto-Tagging** Technology as a Service



Georgi Kadrev @georgikadrev
Imagga Technologies @imagga
IPTC '17, June 16th

IDC Innovator 2016

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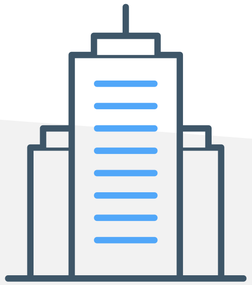
In **numbers**



more than

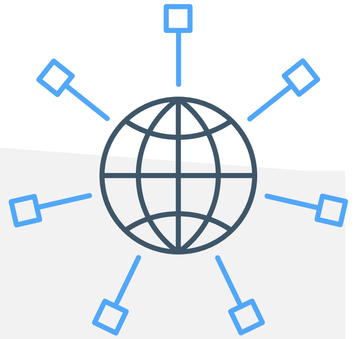
200

Businesses

more than

9.9K

Developers



in more than

82

Countries Worldwide

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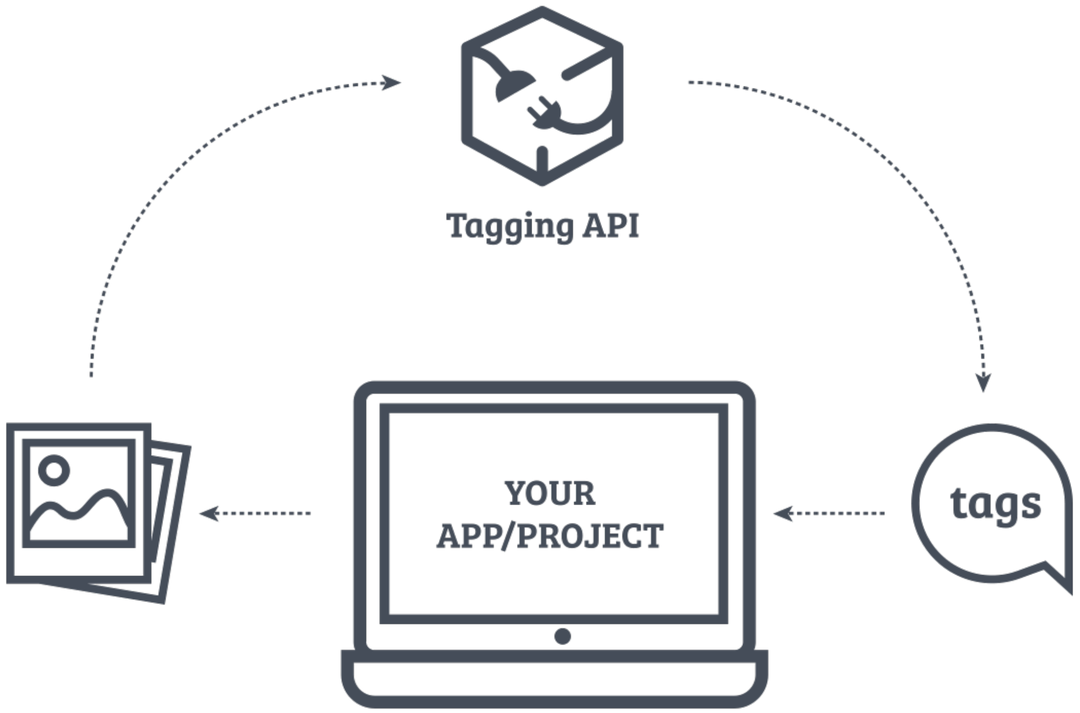
Image Recognition as Service



1. **Submit** an image
2. **Get** a list of **tags** or **categories**
3. **Do** whatever you need with them

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DIY (Do It Yourself)

- Collect data
- Train and optimize
- Deploy and handle scale
- Support and maintain
- Keep innovating

Frameworks

TensorFlow™ Caffe Caffe2 theano torch mxnet

Utilize a **service**

Services

- **Zero time** to market
- **No backend operations** needed
- **Pay as you go** pricing

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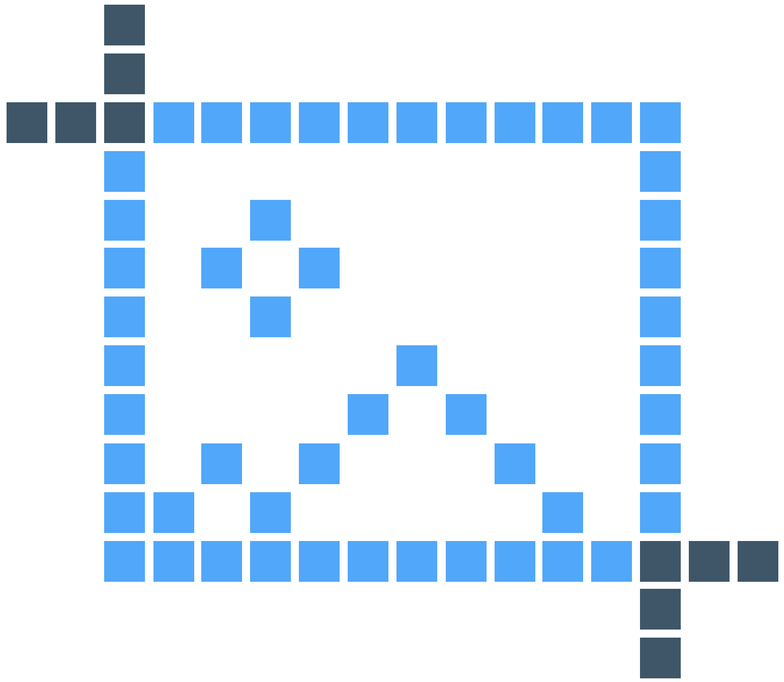
Traditional Processing



- Amazon MT
- TagCow
- **Imagga**
- Imense
- CamFind (Cloudsight)

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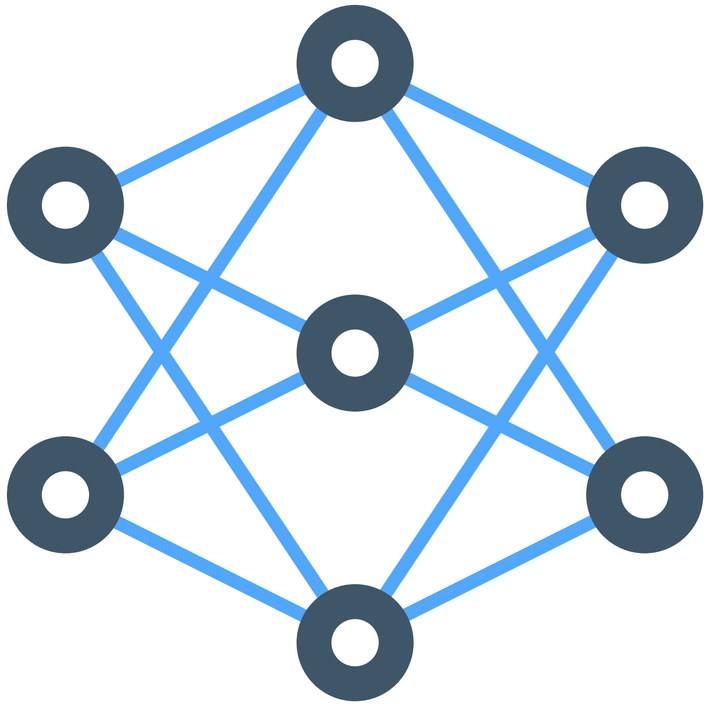
Deep Learning Based



- **Imagga**
- Clarifai
- Rekognition (Orbeus)
- Cloudsight
- Metamind
- MS Cognitive Services
- IBM Watson
- Google Cloud Vision
- Amazon Rekognition (acquired Orbeus)
- Salesforce Einstein (acquired Metamind)

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Practical **Features**

- Detect faces
- Extract text
- Extract colors
- Analyze composition
- Classify/categorize scenes
- Recognize the main object
- Suggest multiple keywords
- Generate textual descriptions
- Recognize quality and art value
- Localize multiple objects

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Detect Faces

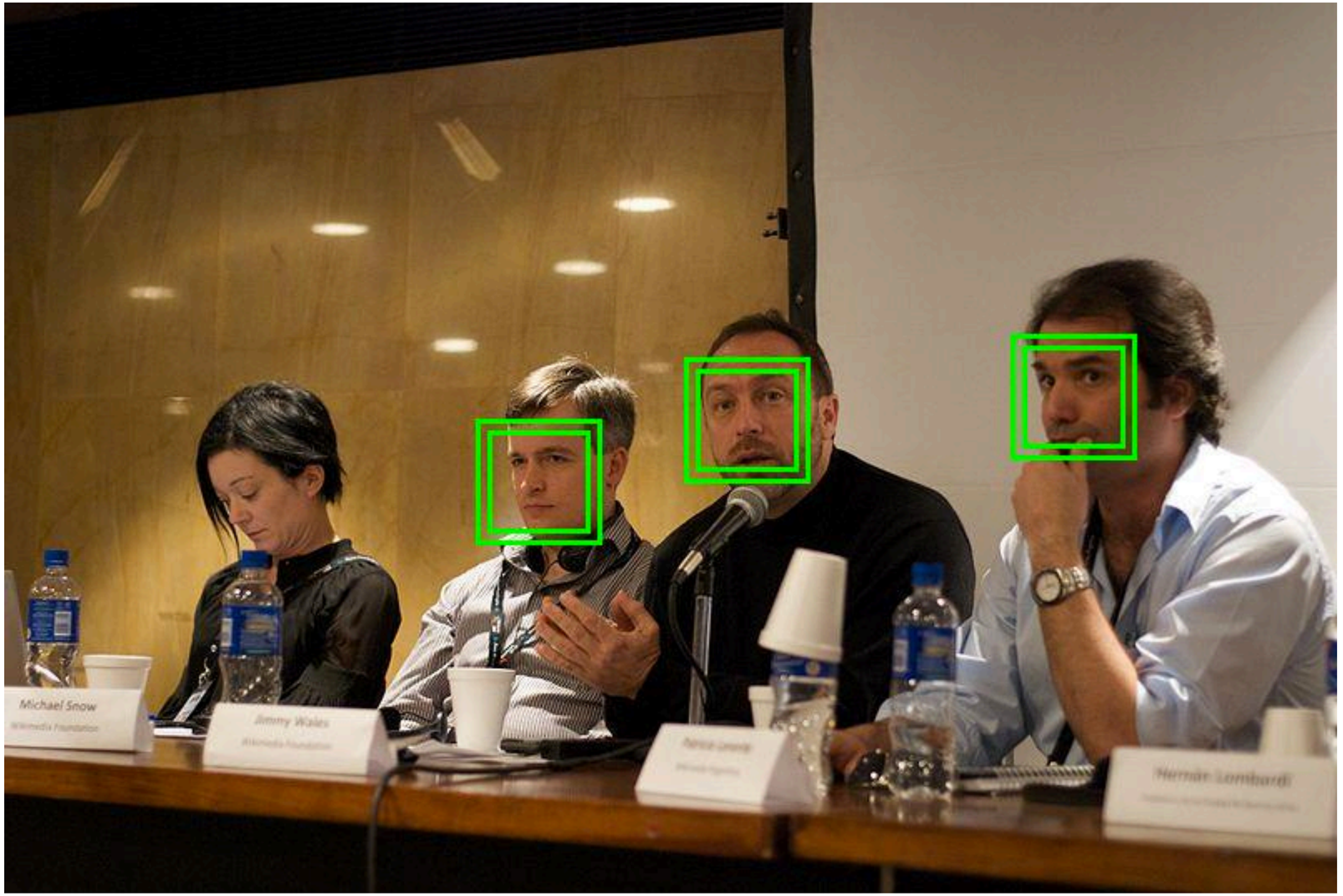

Image source: Wikipedia, CC3 license

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Extract Text

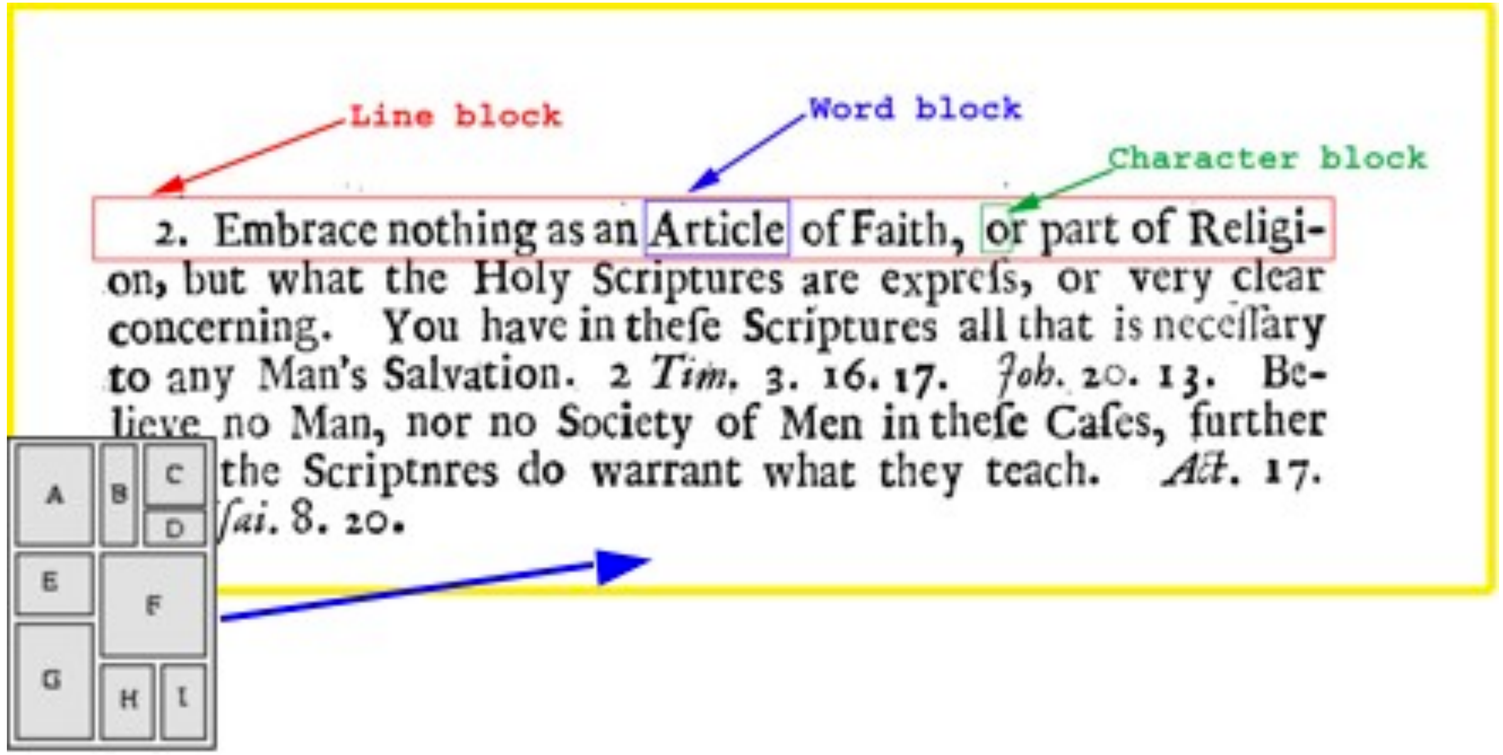

Image source: http://simon-tanner.blogspot.com/2015/06/text-capture-and-optical-character.html

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Extract Colors

light blue

blue

black

navy blue

orange

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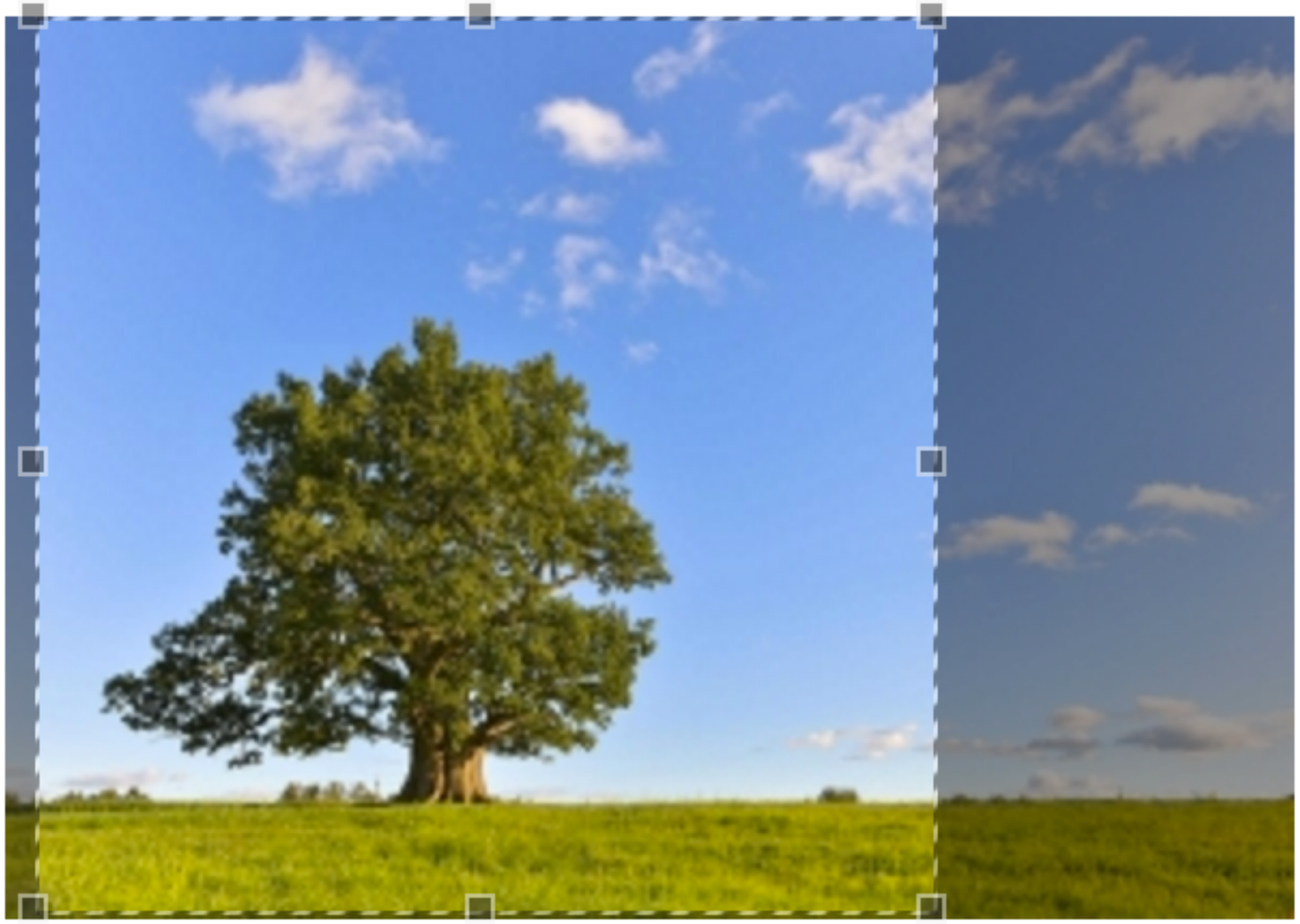
Analyze Composition



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Classify/Categorize Scenes

Beaches & Seaside

Nature & Landscape

Sunrises & Sunsets

Events & Parties

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Recognize The Main Object

100% parrot

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Suggest Multiple Keywords

100% parrot

100% bird

10% tropical

macaw 100%

beak 13%

wildlife 10%

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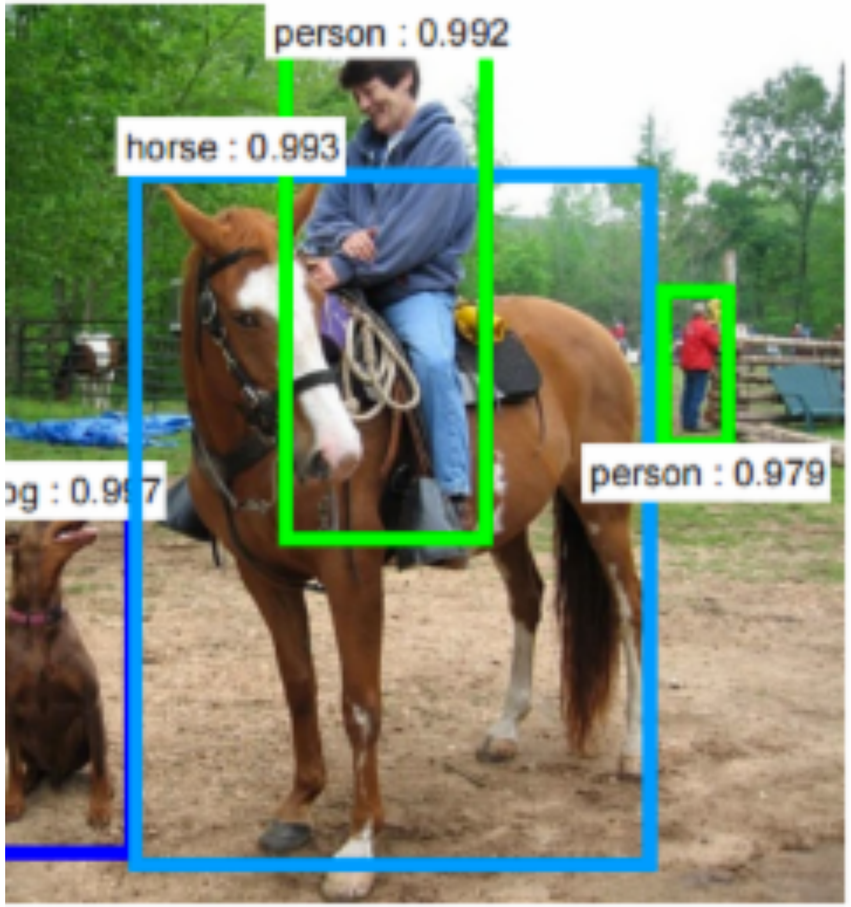
Localize Multiple Objects



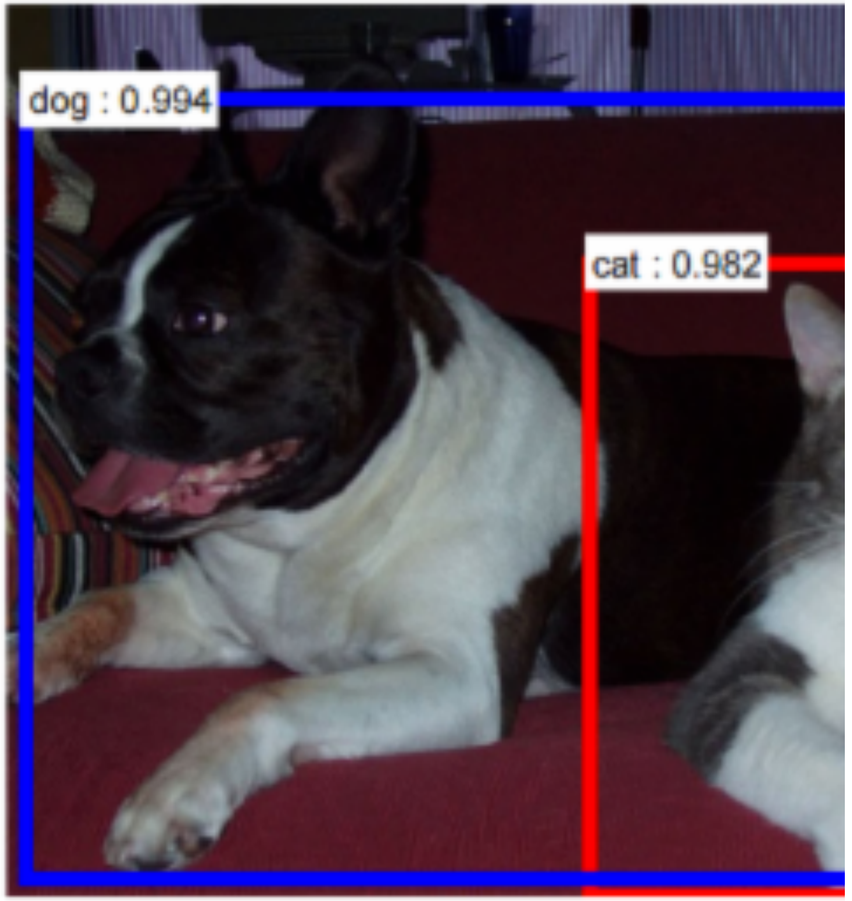


Image source: https://www.linkedin.com/pulse/object-detection-using-deep-learning-advanced-users-part-1-sinhal

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Generate Textual Descriptions

"man in black shirt is playing guitar."

"construction worker in orange safety vest is working on road."

"two young girls are playing with lego toy."

"boy is doing backflip on wakeboard."

"girl in pink dress is jumping in air."

"black and white dog jumps over bar."

"young girl in pink shirt is swinging on swing."

"man in blue wetsuit is surfing on wave."

Image captured from: http://cs.stanford.edu/people/karpathy/deepimagesent/

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Recognize Quality and Art Value

Aesthetics really good 78%

Suggested tags

silhouette | basketball - sport | sunset | basketball hoop | sport | basketball player | leisure activity | court | outdoors | taking a shot - sport | men | sky | real people | people | adult | day | adults only

Suggested caption

silhouette of basketball hoop against sky during sunset

Image source: EyeEm Vision demo page

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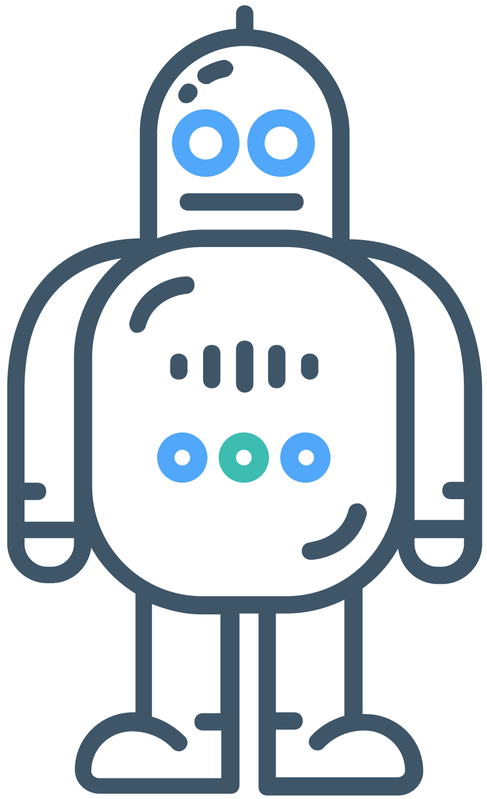
Practical **Use-cases**



- **Internal organization of photos**
- **Organization of photos for sale**
- Organization of personal photos
- **Content moderation**
- Marketing and advertising
- Analytics and profiling
- **Content recommendation**

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Use-cases

PLEX

KIA MOTORS

BLITLINE
IMAGE PROCESSING IN THE CLOUD

swisscom

Cloudinary

taVisca®
Travel Technology Specialists

Unsplash

- Cloud Services / Telcos
- Social Media Monitoring
- Contextual Advertising
- Digital Asset Management
- Image Processing Platforms
- Smart Devices and Installations

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Use-case: **Automated Keywording**

Unsplash

Providing **powerful image search** capabilities.

Reduces/replace manual tagging and enhances search.

Technologies used:

Tagging API

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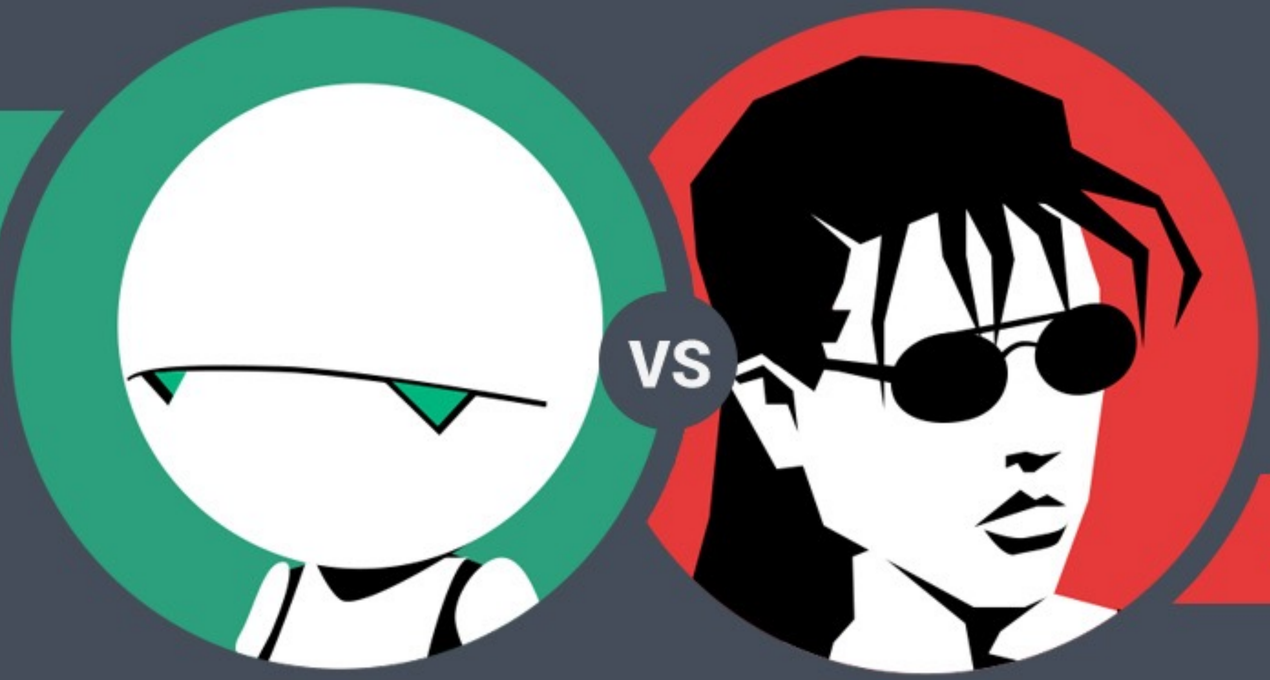
Use-case: **Automated Keywording**

CLASH OF TAGS

32.5 % Robot



Human 51.1 %

powered by

Algolia & imagga

Use-case: **Swisscom**

swisscom

Enhancing Swisscom myCloud with **automated image organization.**

Technologies used:

Tg **Tagging API**

Ct **Categorization API**

Seoul National University
Experimental Device Lab

Identify purity of waste sorting

Technologies used:

Categorization API

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Use-case: **Customer Profiling**

KIA K5 (Optima)
Creative Campaign

Very precise personalized targeting.

SEEDPOST & SEEDPAPER

Technologies used:

Tg **Tagging API**

Co **Color Extraction API**

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Challenges

- **Definition of the scope**
- Training **Data**
- Even more **data**
- True learning from **data**
- Learning from **private data**

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Addressing Privacy Policies

On-premise Solution

- World first
- Ultimate Privacy
- Enterprise class
- Easy deployment
- Custom categorization option
- Prepaid or pay-as-you go volume-based license
- Standard and advanced support per machine

Thank You!

api@imagga.com twitter.com/imagga facebook.com/imagga

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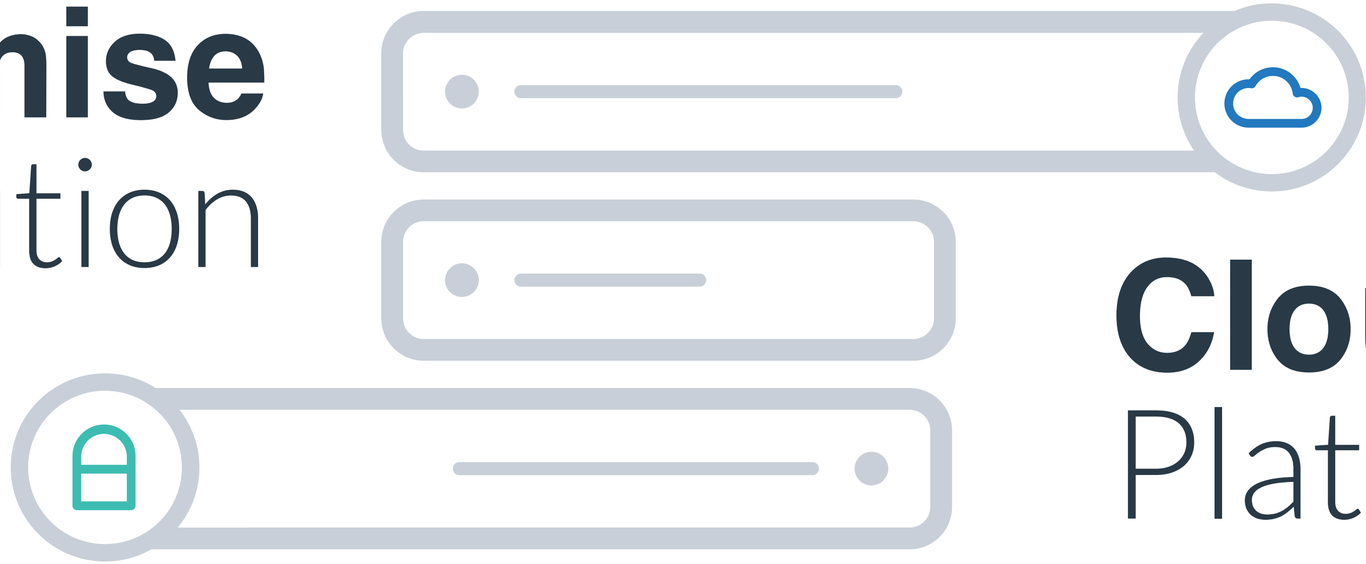
Integration & Business Model

On-premise
Solution

Volume License
S&M



Cloud API
Platform

Monthly Subscription
Self-service

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Use-case: **Tavisca**

tavisca®
Travel Technology Specialists

Building a **custom hotel classifier.**

Automates classification and improving browsing experience

Technologies used:

Tg **Tagging API**

Cs **Custom Training**

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Upcoming Imagga features

- Out-of-the-box **on-premise** packaging
- Official **face recognition** support
- Official **video** support
- **Logo and landmark** recognition
- Better **multi-language** support
- Positional **object detection**

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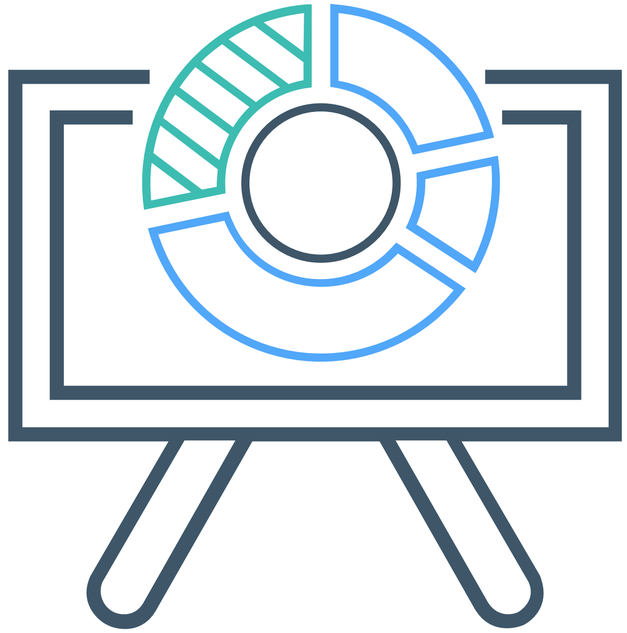
Competitive Landscape

Giants:

- Google Cloud Vision
- AWS Rekognition
- Microsoft Cognitive API
- IBM Watson Vision
- Salesforce Einstein

Notable Startups:

- Clarifai
- EyeEm (Vision)
- CloudSight



Imagga:

- On-premise option
- Professional custom training

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Keyword and Color Tagging

100% parrot

100% bird

10% tropical

macaw 100%

beak 13%

wildlife 10%

light blue | blue | black | navy blue | orange

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Category Tagging

Beaches & Seaside

Nature & Landscape

Sunrises & Sunsets

Events & Parties

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Content Moderation Tagging

NSFW

(Not Safe For Work)

- Safe
- Underwear
- Not safe

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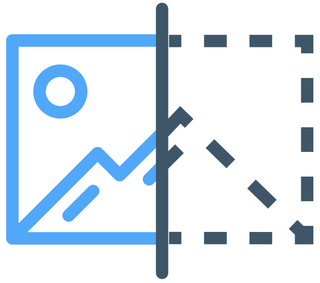
Underlying Technology

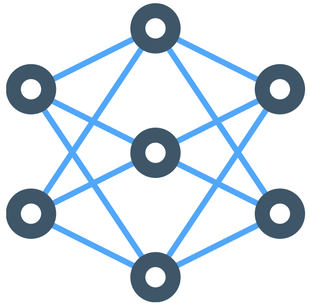


Automated Analysis

of raster/pixel data

Image Tagging

3,000+ objects
20,000+ terms/concepts



Neural Networks

deep learning
+ feature extraction
+ semantic expansion

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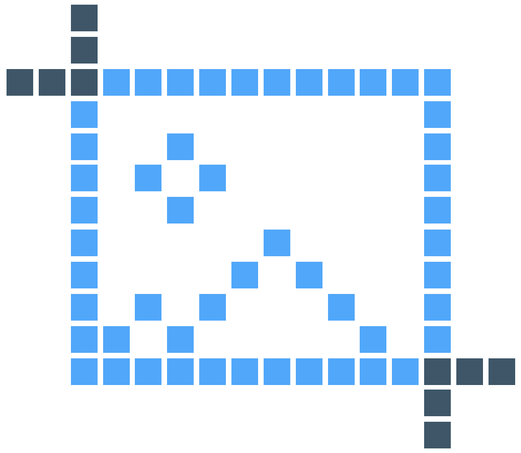
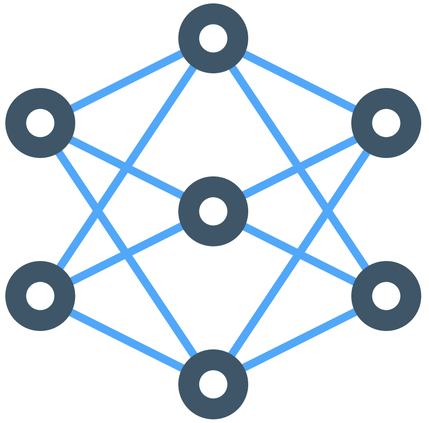


Traditional Image Processing

and/or **crowd-sourced**

&



Deep Learning

Based

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Use case: **Cloud Service Providers/Telcos**

- Is 95% of cloud storage photos and videos? **YES!**
- Does Google, Apple and Amazon have image recognition? **YES!**
- Do you have it? **NO!**
- Do you want to leave them ahead or you want to have it right now? **NOW!**
- What do you get? **Increased cloud retention and lock in!**
- Does it really work? **YES!**
- How do we know? **Swisscom and 200+ more happy paying customers!**

Popular **Frameworks**

- CudaConvnet
- Caffe
- Torch
- Theano
- MS Cognitive Toolkit
- TensorFlow
- Caffe2