

Implementing OCI AI Services for Text Recognition & Image Classification into an APEX application

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WHO AM I?

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Warning 

Content may include NFSW
material



Agenda

- | OCI AI services
- | Analyze images process
- | Entity recognition
- | Training custom model

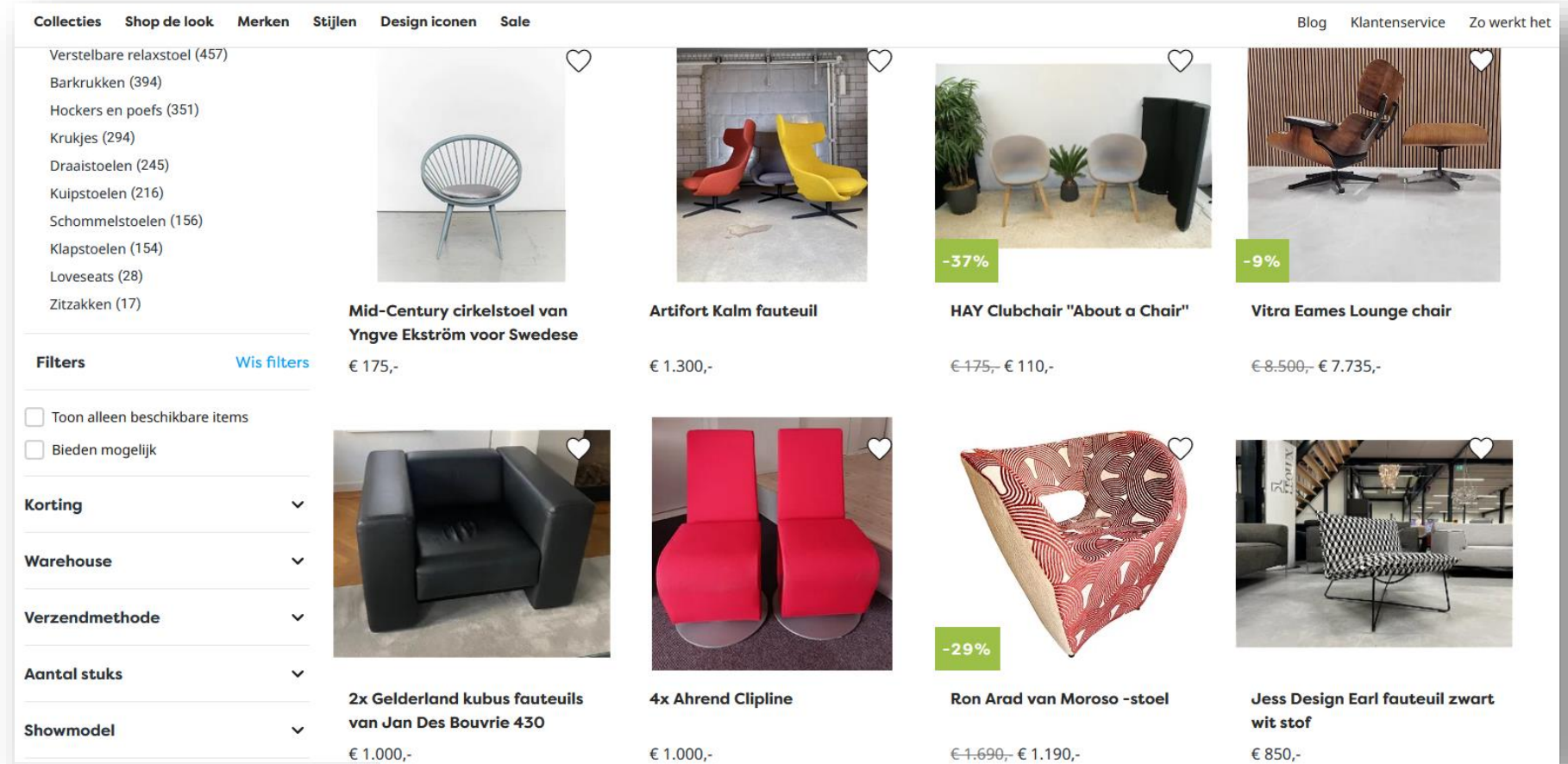
Use case

Marketplace application

Identify unwanted images

Moderate descriptions

AI vs manual annotation



<https://www.whoppah.com/nl/meubels/stoelen-fauteuils>

A blue-tinted background image showing a group of people in a meeting. A woman in the foreground is looking towards the right. In the background, a man is holding up a sticky note, and another person is also holding a sticky note. The scene appears to be a collaborative work environment.

OCI AI SERVICES

OCI AI Services

- | Vision
- | Language
- | Speech
- | Document Understanding
- | Digital Assistant



OCI Vision

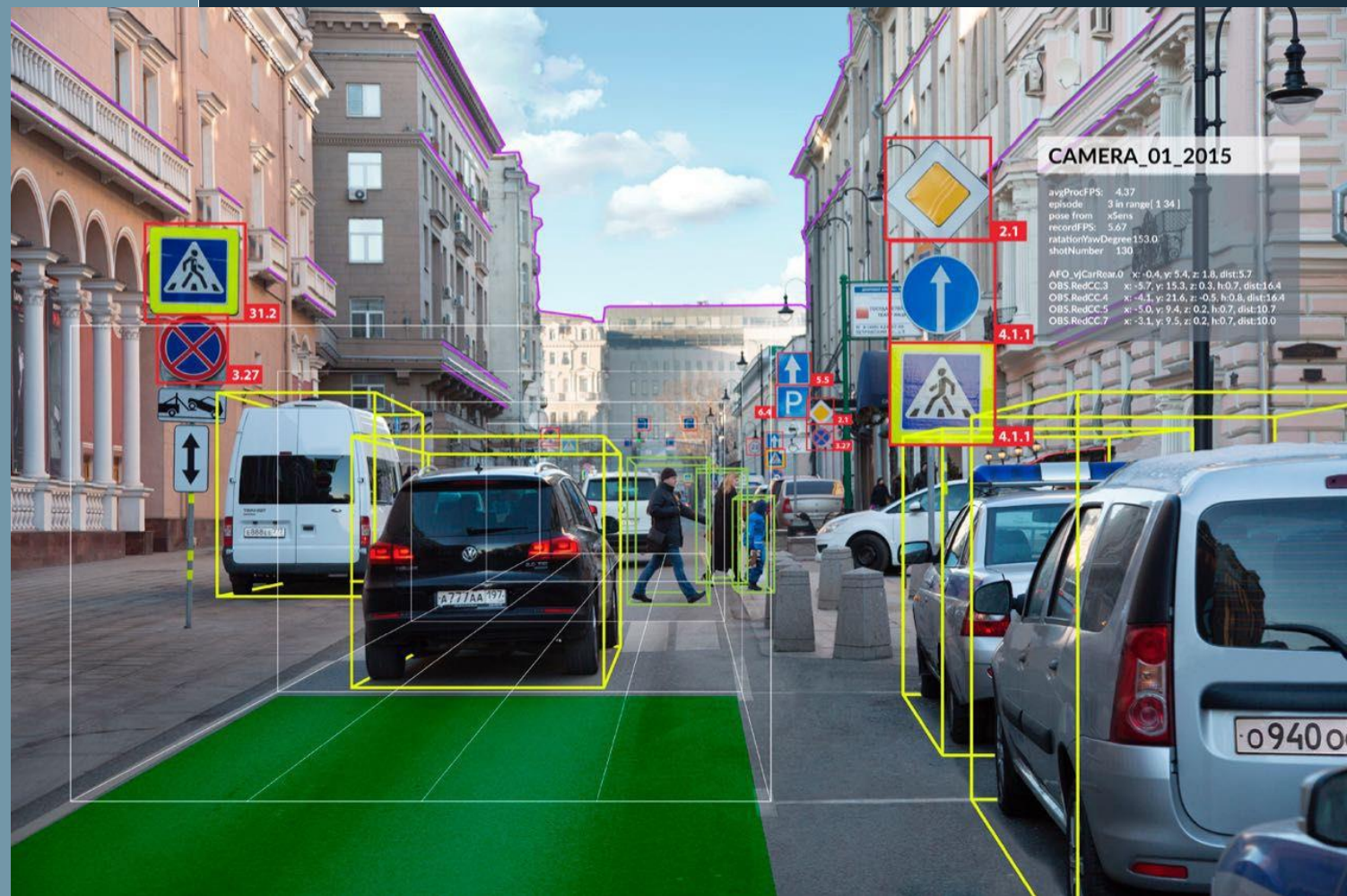
Image analysis

Object detection

Image classification

Face detection

Text detection



https://miro.medium.com/max/2560/1*5IVCJ0SFVvOc4h2rta-7yg.jpeg

Image classification

- | Identifying features and objects
- | Pre-trained model
- | Label
- | Ontology class
- | Confidence score
- | Single or Batch request

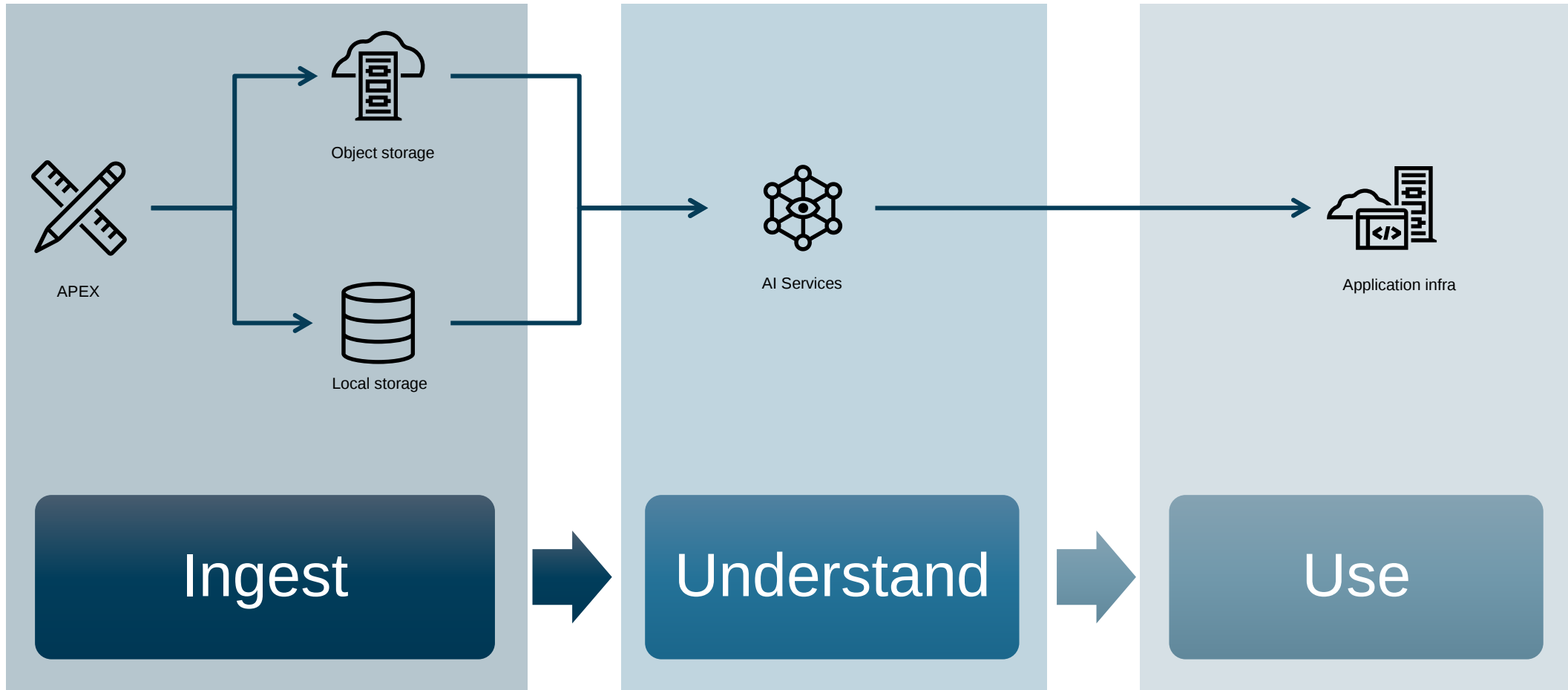
```
{  
  "labels": [  
    {"name": "Chair", "confidence": 0.98680276},  
    {"name": "Stool", "confidence": 0.7462843},  
    {"name": "Furniture", "confidence": 0.6681656}  
  ]  
}
```





CLASSIFY IMAGE IN APEX

Classify image



Requirements

1. OCI (paid)
 1. API key
2. APEX
 1. Web credential
 2. REST data source
 3. Image upload process
 4. Analyze process



OCI – API Key

| Add API in OCI

| Copy API key parameters

Configuration file preview

Help

Note: This configuration file snippet includes the basic authentication information you'll need to use the SDK, CLI, or other OCI developer tool. Paste the contents of the text box into your `~/.oci/config` file and update the `key_file` parameter with the file path to your private key. [Learn more](#)

Select API key fingerprint

dd:d1:00 [REDACTED]

Configuration file preview *Read-only*

```
[DEFAULT]
user=ocid1.user.oc1..aa[REDACTED]nppa
fingerprint=dd:d1:00[REDACTED]:5e
tenancy=ocid1.tenancy.oc1[REDACTED]edifq
region=eu-amsterdam-1
key_file=<path to your private keyfile> # TODO
```

[Copy](#)

Paste the contents of the text box into your `~/.oci/config` file.

Close

APEX - Web credential

| Create web credential in APEX

| Workspace utilities

| Authentication type

| *Oracle Cloud Infrastructure*

↑ Workspace Utilities

Workspace Utilities

 REST Enabled SQL Services Manage references to external REST Enabled SQL services.	 Remote Servers Manage Remote Server objects used for REST Data Sources and Authentications.
 Application Groups Organize applications into logical groups.	 Web Credentials Manage secure credentials to connect to REST Enabled SQL or other REST services.
 Workspace Themes Manage workspace themes that can be utilized by any application within the workspace.	 Export ... Export workspace components.
 Oracle APEX Views Query the various views against Oracle APEX metadata.	 Manage Backups View and manage backups across applications in this workspace
 REST Source Catalogs Manage catalogs of REST Sources for integration into applications	

Get started

Dashboard

Service links

PINNED

- Autonomous Database Autonomous Database
- Vision AI Services
- Cost Analysis Cost Management
- Instances Compute
- Virtual cloud networks Networking

RECENTLY VISITED

- Data Labeling Machine Learning
- Buckets Object Storage & Archive Storage
- Identity Identity & Security
- Language AI Services
- Data Science Machine Learning
- Domains Identity

RECOMMENDED - [Customize](#)

- Logging Logging
- Policies Identity
- Tenancies Organization Management

Your tenancy
tsapexAll services operational
[View health dashboard](#)Experience previews **New**

Explore OCI experiences ahead of their general availability and provide early feedback.

[Opt in to experience previews](#)Marketplace **New**

A one-stop shop to quickly and securely deploy any Oracle or 3rd Party application, including Oracle E-Business Suite, Fortinet, Cisco, Palo Alto Networks, Sesame Software, etc

[Learn more](#)

Enable MFA Recommendation

Improve your security posture by enabling multi-factor authentication (MFA). See [IAM MFA](#) for setup instructions.

Get early access to OCI features

Try out upcoming features and share your feedback

[Join Oracle Beta Program](#)

What's new

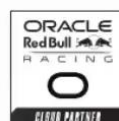
Quickstarts

[View my deployments](#)

FEATURED

Predict the result of the next race

25-30 mins



APPLICATION DEVELOPMENT



Deploy a WordPress website

6-8 mins

APPLICATION DEVELOPMENT



Deploy a low-code app on Autonomous Database using APEX

3-5 mins

APPLICATION DEVELOPMENT



Deploy RStudio in a container

10-12 mins

APPLICATION DEVELOPMENT



Deploy a baseline landing zone

7-9 mins

DATABASE



Visualize and analyze Strava data on Autonomous Database

2-4 mins

REST data source

```
<location>/
20220125/actions/analyzeImage
```

POST method

Request parameters

l compartmentId

I data

I featureType

I Content-Type

1 response

API Endpoints:

- <https://vision.aiservice.af-johannesburg-1.oc1.oraclecloud.com>
- <https://vision.aiservice.ap-chuncheon-1.oc1.oraclecloud.com>
- <https://vision.aiservice.ap-hyderabad-1.oc1.oraclecloud.com>
- <https://vision.aiservice.ap-melbourne-1.oc1.oraclecloud.com>
- <https://vision.aiservice.ap-mumbai-1.oc1.oraclecloud.com>
- <https://vision.aiservice.ap-osaka-1.oc1.oraclecloud.com>
- ```
{
 "compartmentId": "#COMPARTMENT_ID#",
 "image": {
 "source": "INLINE",
 "data": "#FILE_DATA#"
 },
 "features": [
 {
 "featureType": "#FEATURE_TYPE#",
 "maxResults": 5
 }
]
}
```
- <https://vision.aiservice.eu-jovanovac-1.oc1.oraclecloud20.com>
- <https://vision.aiservice.eu-madrid-1.oc1.oraclecloud.com>
- <https://vision.aiservice.eu-marseille-1.oc1.oraclecloud.com>

APEX

App Builder

SQL Workshop

Team Development

Gallery

Search

?

VI

vision

vision

+

Create

↑

Import

Dashboard

Workspace Utilities

Q

Go

Actions

Create

APEX World 2024

100

1 - 1

vision

vision

en

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Oracle APEX 23.2.3

About

The App Builder enables you to design, develop and deploy applications which are beautiful and responsive.  
[Learn More ...](#)

Recent

APEX World 2024 - 100

Tasks

Manage Backups

Export Applications

Browse by Facets

17

NLOUG APEX World 2024

TRANSFER  
SOLUTIONS

# Upload & analyze image

- | Automatic row processing
- | Execution chain
- | Invoke API
- | Update table

```
update items
set labels = (select listagg(label, ':') within group (order by label)
 from json_table(:P2_RESPONSE, '$.labels[*]' columns (
 label varchar2 path '$.name'
 , confidence number path '$.confidence'))
 where confidence >= 0.85
)
select
 replace(replace(apex_web_service.blob2clobbase64(blob)
 , chr(10), '')
 , chr(13), '') as image
from
 items
where
 id = :P2_ID;
```

```
{
 "labels": [
 {"name": "Chair", "confidence": 0.98680276},
 {"name": "Stool", "confidence": 0.7462843},
 {"name": "Furniture", "confidence": 0.6681656}
]
}
```

APEX

App Builder

SQL Workshop

Team Development

Gallery

Search

vision

Application 100

Page Designer

Page 2: Images

Pre-Rendering

Components

Breadcrumb Bar

Breadcrumb

Next

UPLOAD\_IMAGE

Body

Images

Actions

Sort Order

P2\_ORDER\_BY

P2\_RESPONSE

Dialogs, Drawers and Popups

Upload image

Region Body

P2\_ID

P2\_IMAGE

P2\_MIME\_TYPE

P2\_NAME

P2\_LABELS

P2\_CREATED\_DATE

P2\_CREATED\_BY

P2\_UPDATED\_DATE

P2\_UPDATED\_BY

Delete

CANCEL

Layout

Page Search

Help

Images

BANNER

AFTER LOGO

BEFORE NAVIGATION BAR

AFTER NAVIGATION BAR

TOP NAVIGATION

BREADCRUMB BAR

Breadcrumb

UP

REGION BODY

REGION CONTENT

SUB REGIONS

PREVIOUS

CLOSE

DELETE

HELP

CHANGE

EDIT

COPY

CREATE

NEXT

UPLOAD\_IMAGE

SEARCH FIELD AND SMART FILTERS

FULL WIDTH CONTENT

BODY

Images

SORT ORDER

P2\_ORDER\_BY

Page

Filter

Identification

Name

Images

Alias

images

Title

Images

Page Group

- Select -

Appearance

Page Mode

Normal

Page Template

Theme Default

Template Options

Use Template Defaults

CSS Classes

Media Type

Navigation Menu

Override User Interface Level

Navigation

Cursor Focus

Do not focus cursor

Warn on Unsaved Changes

JavaScript

19

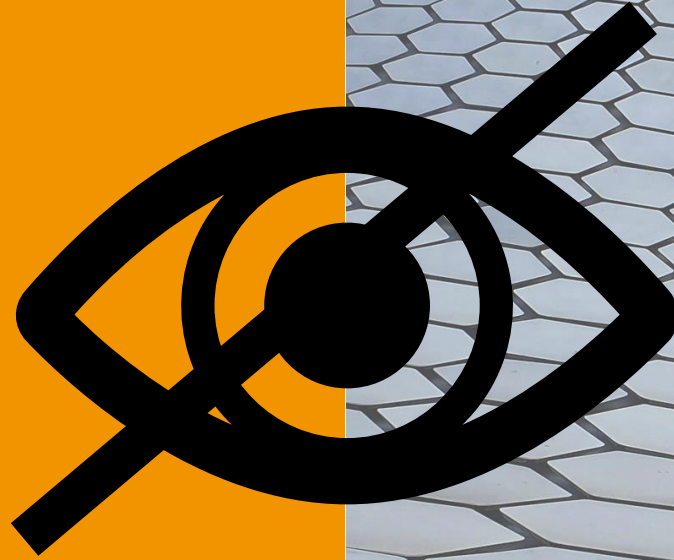
NLOUG APEX World 2024

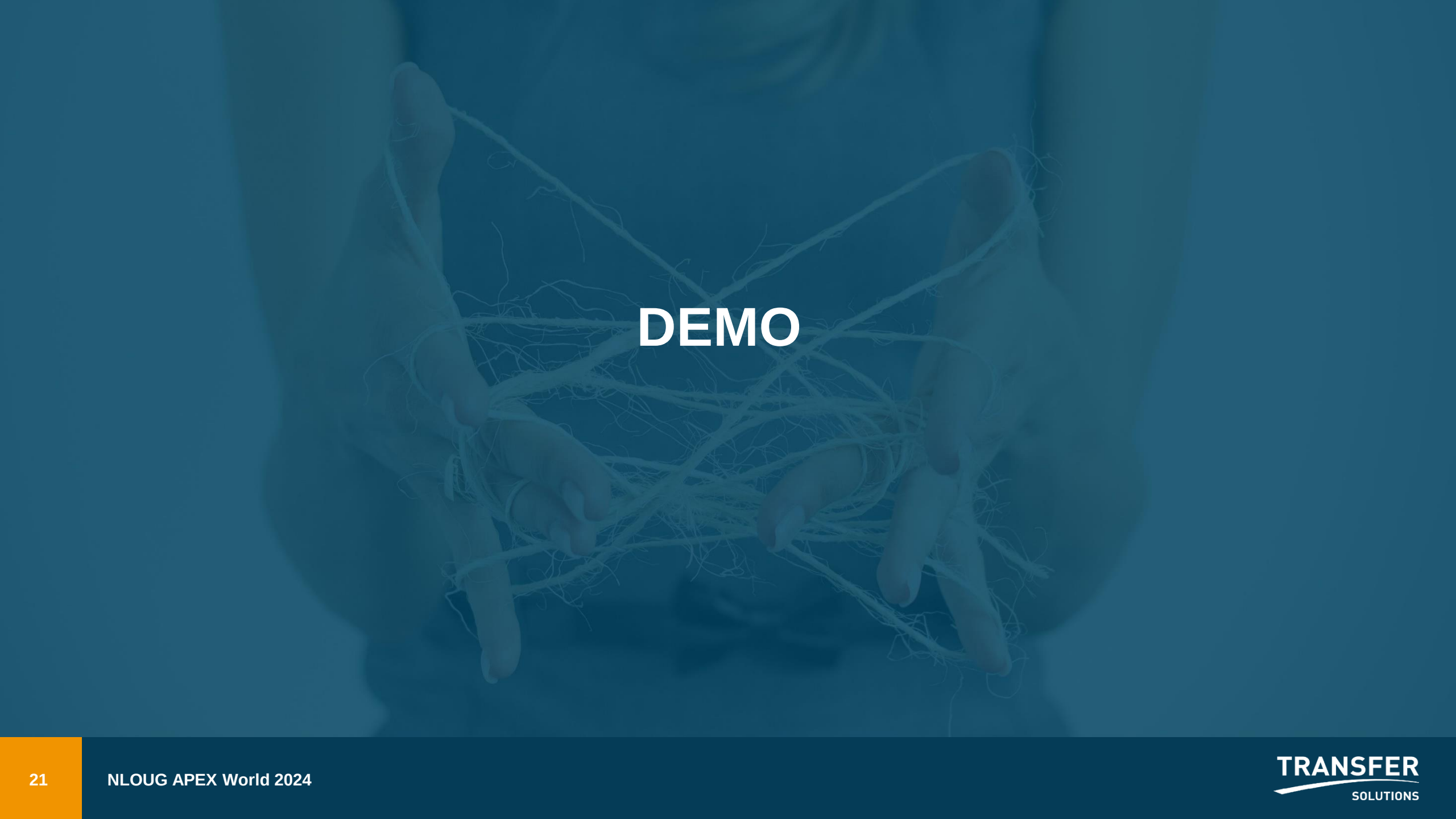
TRANSFER

SOLUTIONS

# Censor

- | Job
- | Keywords
  - | Weapons
  - | NSFW
  - | etc.
- | Flag record





# DEMO

# Train custom model

- | Machine learning
- | Dataset in object storage
- | Single or multiple labels
- | 50 or more images
- | Training duration



# Dataset

- | Collect images from Reddit



- | nsfw\_data\_scraper

- | [https://github.com/alex000kim/nsfw\\_data\\_scraper/](https://github.com/alex000kim/nsfw_data_scraper/)

- | RipMe

- | <https://github.com/RipMeApp/ripme>

- | gallery-dl

- | <https://github.com/mikf/gallery-dl>



## Vision

## Overview

[Image classification](#)[Object detection](#)[Face detection](#)[Text detection](#)[Custom models](#)[Projects](#)

## Vision

## Extract insights from visual data

Use Oracle Cloud Infrastructure Vision for image recognition tasks like classifying images, detecting objects, detecting faces, and extracting text. Either leverage pretrained models or easily create custom models for industry and customer specific scenarios. Vision service is a fully managed, multi-tenant, native cloud service that helps you with all your common computer vision tasks.

[Watch service tour](#)

## Get started

## Video tours

[Overview](#)

## Essentials

[Vision overview](#)[Policies for Vision](#)

## Resources

[Self-paced workshop](#)[Documentation](#)[Frequently asked questions](#)[Oracle Cloud Customer Connect](#)

## Features

## Image classification

Categorizes scene-based features and objects within an image

## Object detection

Locates and identifies objects within an image

## Face detection

Locates and identifies human faces within an image

## How to

[Detect the objects in video](#)[Integrate vision features with your analytics application](#)[Extract data from scanned documents](#)

# Calling custom model

- 1 Add parameter to REST data source

```
{
 "compartmentId": "#COMPARTMENT_ID#",
 "image": {
 "source": "INLINE",
 "data": "#FILE_DATA#"
 },
 "features": [
 {
 "modelId": "#MODEL_ID#",
 "featureType": "#FEATURE_TYPE#",
 "maxResults": 5
 }
]
}
```

Model information

Tags

## General information

Description:

Model type: IMAGE\_CLASSIFICATION

OCID: ...whuwwa Show Copy

Training data asset: ...vamzeka5d6l2pwqcha Show Copy

Created by: default/boyd.timmerman@transfer-solutions.com

Created: Thu, Mar 14, 2024, 09:14:19 UTC

Max training duration: 24 hours (Recommended mode)

## Training metrics

Precision: 100.00%

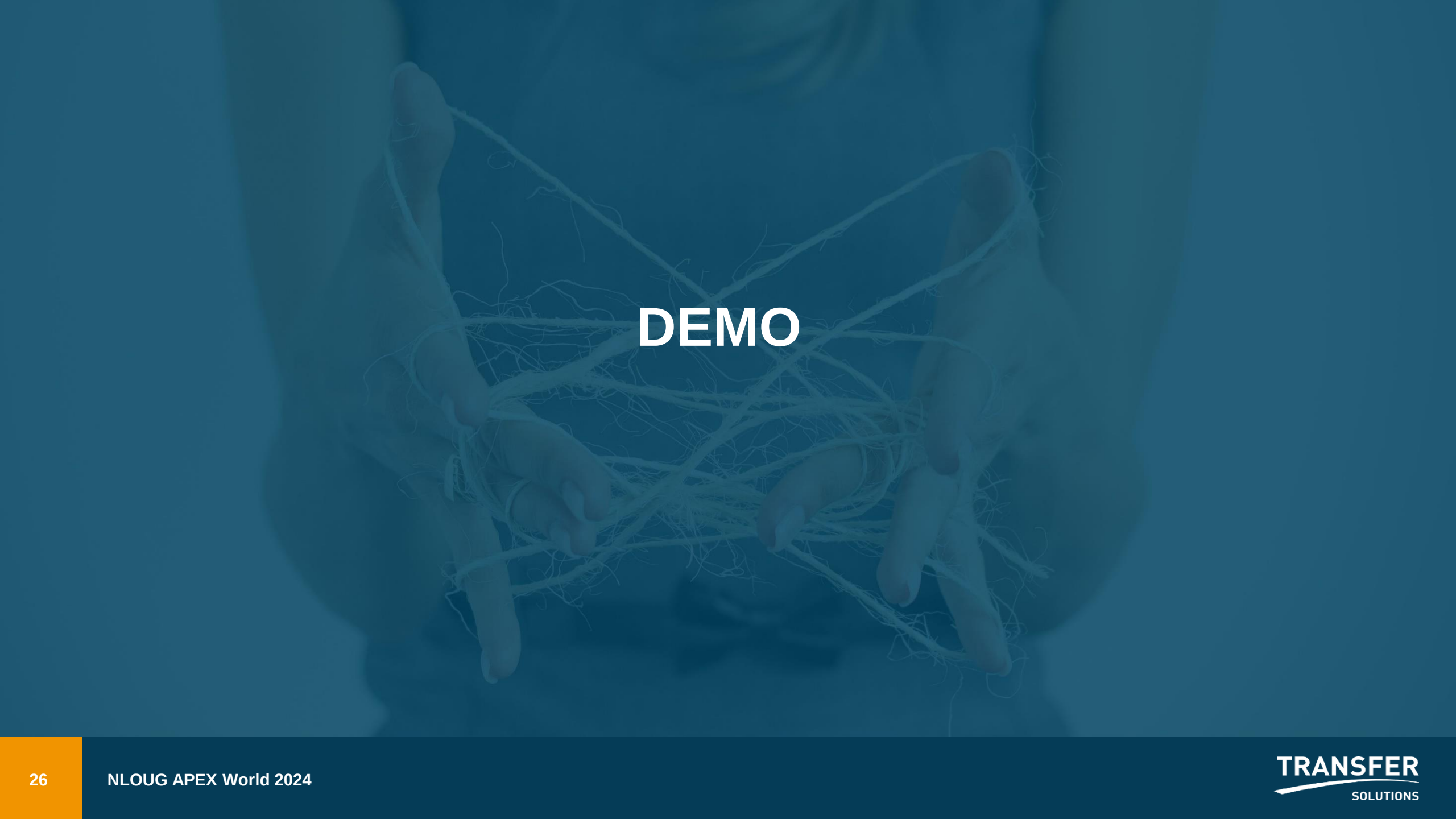
Recall: 100.00%

F1 score: 100.00%

Total valid images: 54

Test images: 6

Trained duration in hours: 0.1519 hr ( 0 hr 9 min )



# DEMO



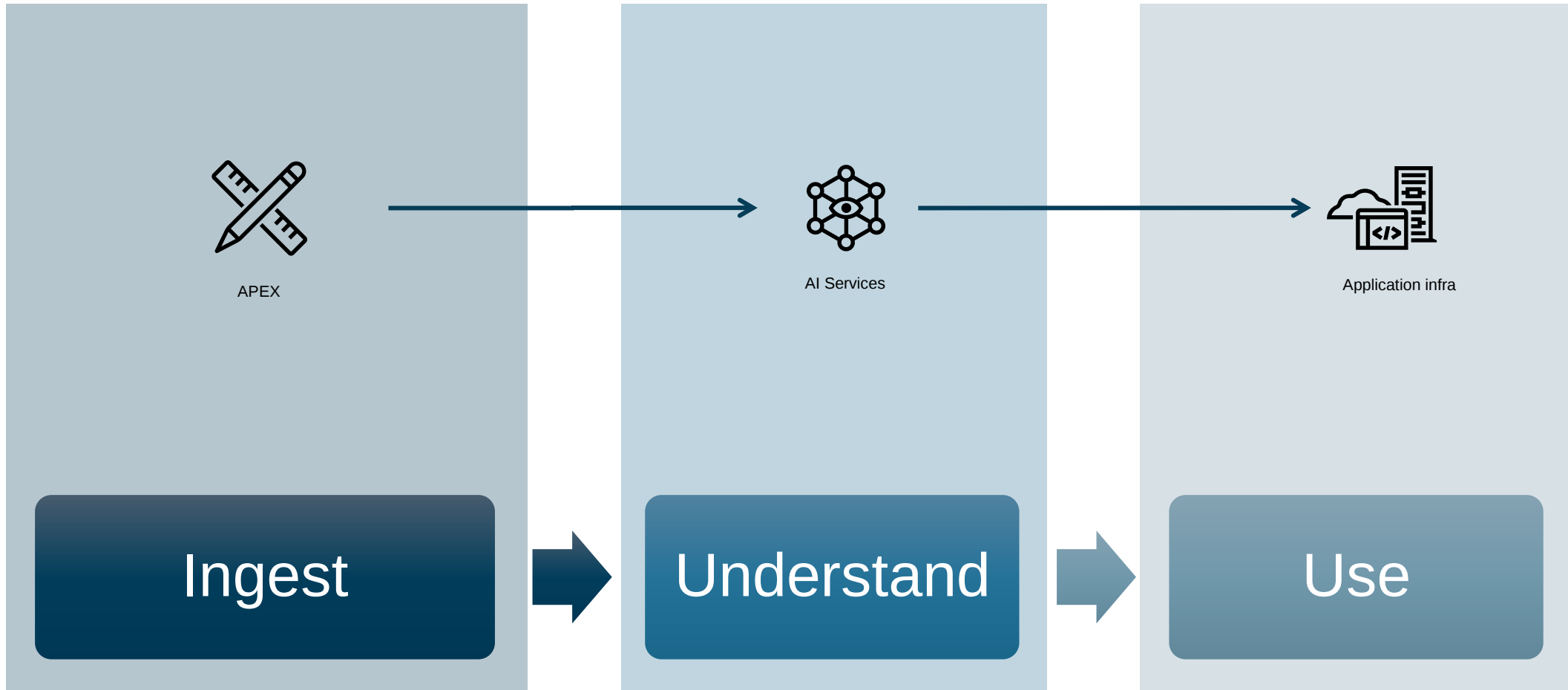
# LANGUAGE

# Language

- | Language models
- | Language detection
- | Translation
- | Sentiment analysis
- | Entity recognition



# Entity recognition



# Entity recognition

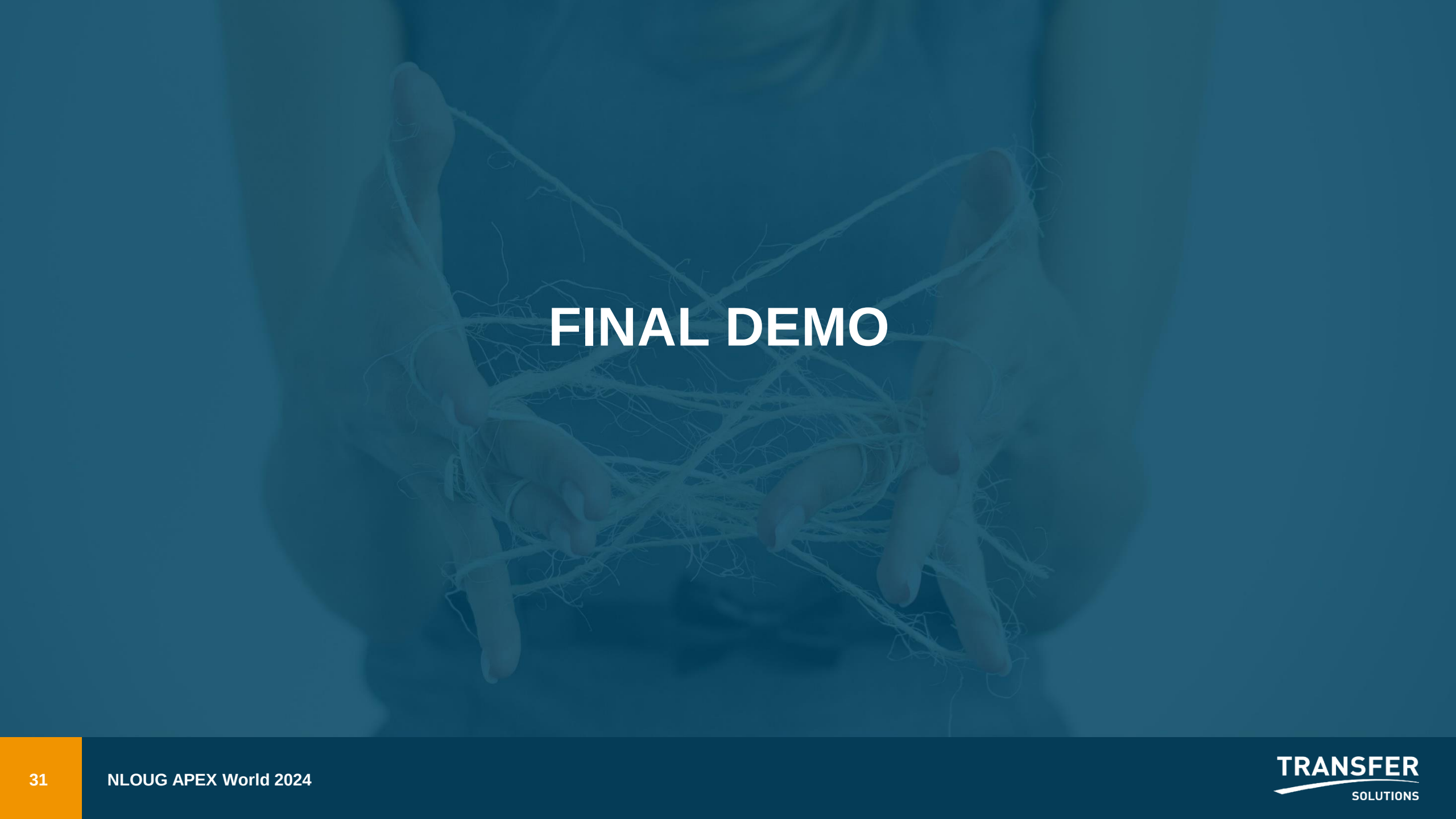
`<location>/20221001/  
actions/batchDetectLanguageEntities`

POST method

Batch request

English and Spanish

```
{
 "documents": [
 {
 "key": "sample text",
 "entities": [
 {
 "offset": 146,
 "length": 5,
 "text": "1500s",
 "type": "DATETIME",
 "subType": "INTERVAL",
 "score": 0.9863125681877136,
 "metaInfo": [
 {
 "offset": 146,
 "length": 5,
 "text": "1500s",
 "subType": "DATE",
 "score": 0.9863125681877136
 }
]
 },
 {
 "offset": 240,
 "length": 4,
 "text": "book",
 "type": "PRODUCT",
 "subType": null,
 "score": 0.8456036448478699,
 "metaInfo": null
 },
 {
 "offset": 271,
 "length": 14,
 "text": "five centuries",
 "type": "DATETIME",
 "subType": "DURATION",
 "score": 0.9765945374965668,
 "metaInfo": null
 }
]
 }
]
}
```



# FINAL DEMO

# Conclusion

- | AI Services are easy to use
- | Pre-trained models are limited
- | With custom models the possibilities are endless
- | Set thresholds for false positives/negatives



## More info here



[btimmerman.hashnode.dev](https://btimmerman.hashnode.dev)



[github.com/boydtimmerman](https://github.com/boydtimmerman)



[linkedin.com/in/boyd-timmerman](https://linkedin.com/in/boyd-timmerman)

