



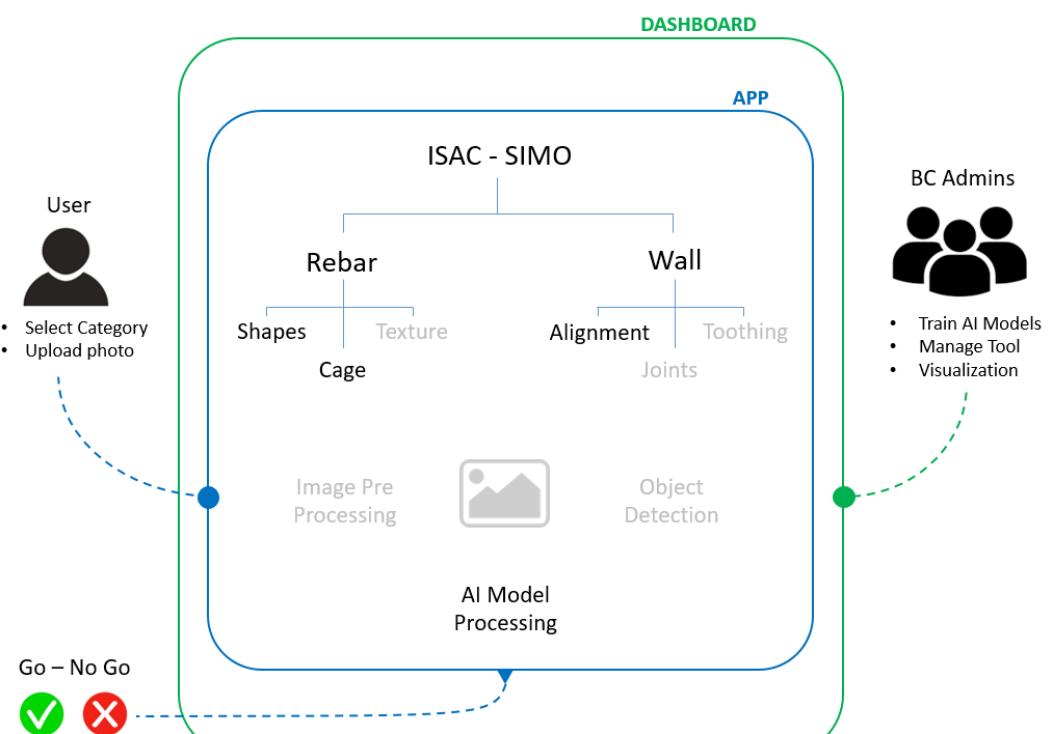
INTRODUCTION

Intelligent Supervision Assistant for Construction - Sistema Inteligente de Monitoreo de Obra

ISAC-SIMO is a system to validate that the intervention work done for homeowners has been done correctly and safely. It is a Build Change project supported by a grant from IBM.

Project detail

The technology consists of a mobile application in order to track the progression of an intervention on a home throughout the process to complete work. The application can validate and analyze the quality of building elements, rebar, walls etc. by guiding the users through a series of checks. In addition to the mobile application, the tool also consists of a web interface that facilitates the management of checks and image processing pipelines implemented.



Overview of the ISAC-SIMO tool

Web Application

This section provides a brief Guide on using the ISAC-SIMO Web Application. It guides you through user registration, project management, classifier/model creation, object types and more.

LOGIN & REGISTER

ISAC-SIMO

Sign In

Email*

user@example.com

Password*

Remember Me

Login

Register New Account ?

ISAC-SIMO

Register New Account

Email*

Full Name*

Profile Picture

Choose File No file chosen

Password*

Use strong password with at least 8 characters.

Password confirmation*

Enter the same password.

Type*

User

Project Admin

Register

Already a User ? Login Here

Users can easily register themselves, and choose to be either a normal **User** or a **Project Admin**. As the name suggests, Project Admin can create or moderate Projects, Users, Models and Pipelines. While, normal users can test images and manage their own tested images.

After logging into the web application, the user is presented with a dashboard. Users can click on their name in the sidebar and open the profile page, where they can update profile information and generate API Access Tokens.

Want to Generate Access Token to use with APIs?

Generate Token

DASHBOARD

Location of all Images
If Latitude/Longitude Provided

LatLng(2.634957, -72.674561)

Dashboard

Logout & Options

Home / Dashboard

Stats & Counts

Value	Category
191	Image(s)
194+	Total Tested Images
6	User Registrations
3	Projects

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Version 0.1.1

User Profile
And Generate API Access Token

Manage & Test Images

Manage User & Link Projects
Or Register New Users with various Permissions

Manage Projects

Manage Object Type
(e.g. Wall, Rebar, Rebar Shapes etc.)

Manage Models / Classifiers
Define the Object Type to trigger on, link Project & More

Manage Local Models (h5, python3 etc.)
Can be linked to any Model / Classifier to use it instead of IBM Watson Online Models. Or as a Pre/Post Processor.

Test Google Street View Images with our Classifiers and Models

Retrain Classifiers
Fetch Classifier Details & Training Status
Fetch Object Type Details & Status
View Offline Model details

Upload Files / Helper Models by Admin

Run Terminal Command by Admin

ISAC-SIMO BETA

Mr. Admin

- Dashboard
- Image
 - View Images
 - Add / Test Images
- Users
- Projects
- Object Types
- Models
- Offline Model / Scripts
- IBM Watson & More
- Google Maps
- File Upload
- Terminal

PROJECTS

Permissions: Admin (All), Project Admin (Own)

Example: Colombia Project, Bisaya Region Rebar Quality Verify Project etc.

Create Project

The screenshot shows a mobile application interface for creating a project. At the top, there's a navigation bar with icons for menu, search, and settings. Below it, the title 'Create Project' is displayed, followed by a breadcrumb trail 'Home / Add Project'. The main form area contains several input fields and sections:

- Project Name***: A text input field containing 'Name of the Project | Required'.
- Description***: A text input field containing 'Brief Description | Required'.
- Online Object Detect Model**: A section for selecting a Watson Object Detect Model. It includes a dropdown labeled 'Default Watson Object Detect Model Name' and instructions: 'Make sure the Objects for this model are created [Here](#)' and 'And add required Classifiers for those model [Here](#)'.
- IBM API KEY**: A section for providing an IBM Watson API Key. It has a text input field 'Enter your IBM Watson API Key' and a note: 'If Provided this Project will be use given Watson Service.' To the right, a button says 'To Use for this Project or other Classifiers'.
- Offline Object Detect Model**: A section for linking a local/offline detect model. It has a dropdown 'Select Offline Detect Model' and a note: 'If Offline Object-Detect Model is provided it is given 1st priority over online model. Add Offline Model [Here](#)'.
- Project Image***: A file selection input with a placeholder 'Choose File' and 'No file chosen'. To its right is a note: 'Image e.g. Logo | Required'.
- Mark as GLOBAL Project**: A checkbox with a note: 'Will be used for Guest/Offline Users in Mobile App. Logged in user will be shown via linked projects. Note: Only One Project should be marked as Global (Best Practice).'
- Add Project**: A large green button at the bottom of the form.

Users can choose to add Watson Object Detect Models Name and the IBM Watson API Key while creating the Project. Or, they can also link a Local/Offline Detect Model. Then, while testing images, users can choose the Project to test on. First the Image will be passed via provided Object Detect Model to find out the possible object in the Image (instead of manually defining the Object Type while testing).

If Marked as "**Global**" it will be shown to Guest/Offline Users in Mobile App. Logged in users will be shown via linked projects.

View Projects

Projects

Home / Projects

+ Add New Project

Show 10 entries

Id	Name	Description	Image	Actions
#3	Earthquake Damage Check	Verify level of severity of earthquake damages. Online Detect Model: 15b7b8e4-05c9-4eb1-bac4-11cf884c7f3 (Default)	View	
#1	Global Guest Project	Project for Global/Guest Users Online Detect Model: 15b7b8e4-05c9-4eb1-bac4-11cf884c7f3 (Default)	View	

Edit

Delete

Search:

Quick Test Object Detection Model

View Linked Object Types

Showing 1 to 3 of 3 entries

Previous **1** Next

Test Projects, Object Detection Model

Test Object Detect Model

Home / Test Object Detect Model

Project Detect Model Test Success.

Score: 0.9791245 | Class: wall

```
[  
  {  
    "object_type": "wall",  
    "temp_image": "Image File",  
    "pipeline": {  
      "score": 0.9791245,  
      "result": "wall",  
      "location": {  
        "left": 118,  
        "top": 714,  
        "width": 1320,  
        "height": 941  
      }  
    }  
  },  
  {  
    "object_type": "rebar",  
    "temp_image": "Image File",  
    "pipeline": {  
      "score": 0.93320346,  
      "result": "rebar",  
      "location": {  
        "left": 35,  
        "top": 0,  
        "width": 1750,  
        "height": 730  
      }  
    }  
  }  
]
```

Clean Temporary Images

Project:

Earthquake Damage Check

Online Model: Default Detection

Image*

wall-rebar-together.jpg

Make sure the Status for this classifier is "ready" [in here](#).

Test Detect Model

Sample Test Response Page

OBJECT TYPES

Permissions: Admin (All), Project Admin (Own & Linked)

Example: wall, rebar, rebar shapes etc.

Create/Add Object Types

The Name of Object Type must be unique for that specific Project. **⚠ If an Object Type is linked to a Project (by Admin), then the Project Admin will have full Access to it.**

View Object Types

Admin and Project Admin can manage Object Types, Change Order of Classifier Pipelines, Test Images against this Object Type and more.

Change the Order of Classifier Pipeline

Object Type

→ Fetch Object Type Details from IBM Watson

Show 10 entries Search

Name	Project	Added By	Actions
Rebar Texture	Global Guest Project	Mr. Admin	
Rebar Rust Detection	Global Guest Project	Mr. Admin	
Wall Bond Pattern	Global Guest Project	Mr. Admin	
Rebar Shape	Global Guest Project	Mr. Admin	
Facade Wall	Global Guest Project	Mr. Admin	
Rebar Hooks Detection	Object Detection Models	Mr. Admin	
Rebar Texture	Object Detection Models	Mr. Admin	

Showing 1 to 7 of 7 entries

Mark Verified or Un-Verified
Will revert to Un-Verified if inner classifier is edited.

Create Object Type

Object Type*
Object Type (e.g. wall, rebar)
Must be unique and lowercase for each project

Project*
Earthquake Damage Check

Instruction
Instruction for Mobile User.
How to take Picture/Video

Instruction Image
Choose File No file chosen
Add **Clear**

Form to add Object Types

Test an Image passing through all Classifier/Model linked to this Object Type

Delete **Edit** **Previous** **1** **Next**

View all Classifiers/Models of this Object Type

Ordering Classifiers for Rebar Shape

→ Create New Classifier

Project: Global Guest Project
Object Type: Rebar Shape
Verified: No

Order	Name	Added By	Actions
1	Gaussian Blur & Resize (Local: Gaussian Blur & Resize)	Mr. Admin Mr. Admin	
2	rebarshapemodel_168863088	Mr. Admin	
3	908b69dc-4b10-4e8a-be61-2469c99838f2	Mr. Admin	
4	Rebar-Shape Post Process (Local: Rebar Shape Post Process)	Mr. Admin	

Save

MODELS / CLASSIFIER

Permissions: Admin (All), Project Admin (Own & Linked)

Type:

- IBM Watson Train New Model
- IBM Watson add Pre-Trained Model
- Offline Model (Classifier, Pre/Post Processor)

Create Models

Admin or Project Admin can add a new Model. A new model can be trained by uploading zipped images and choosing to process it or not. Users can also add Pre-Trained Model by specifying the Classifier Name and IBM Watson API Key. Also, users can add and link Offline Model / Script that can be used either as a Classifier or Pre/Post Processor.

Create Classifier

Source of the Model*

IBM Watson

Choose the Source of Model. IBM Watson for adding trained/pretrained classifier or object detection. Offline Model to add Offline Model/Pre/Post/Processor.

IBM Watson
OR
Offline Model

Would you like to Train Model or Add Pre-Trained Model?*

Add Pre-Trained Model

Pre-Trained Model
OR
Train New Model
If Source of Model is Offline Model then option to Link Offline Model is shown.

Classifier Name*

The name of the new classifier

Name of Classifier

* This is What is used to Call Watson AI

Is Object Detection ?
Check this if you are using IBM Watson Object Detection Model to act as Classifier.

Check this if you are using IBM Watson Object Detection Model to act as Classifier.

IBM API KEY

Enter your IBM Watson API KEY

Provide the IBM API Access Key of this Watson Model
Else Defaults to the linked Projects Watson API KEY

If Provided the Classifier/Model will be linked or created in given Watson Service.

Project*

Select a Project

Link a Project

Links Classifiers to specific Project

Object Type*

Select a Object Type

Link a Object Type (And add to the Pipeline)

Select the Object Type for which to create this classifier.
To Create new Object Type [Go Here](#)

Order*

1

Order to Run in the Pipeline

Create Classifier

View Models

Shows if it is an Offline Model

Show if it is a Pre/Post Processor

Name	Project	Object Type	Order	Actions
Gaussian Blur & Resize (Local: Gaussian Blur & Resize)	Global Guest Project	Rebar Shape	1	
rebarshapesclassifier_166863088	Global Guest Project	Rebar Shape	2	
908b69dc-4b10-4e8a-be61-2469c99838f2	Global Guest Project	Rebar Shape	3	
Rebar-Shapes Post Process (Local: Rebar Shape Post Process)	Global Guest Project	Rebar Shape	4	

- Filter By Project Order Actions

Showing 1 to 4 of 4 entries (filtered from 13 total entries)

Previous **1** Next

Edit

Test this Classifier with an Image
Works for Watson Classifier, Watson Detect Model, Offline Classifier and Offline Pre/Post Processor

Delete

View Info and Labels/Classes (e.g. go,no-go)

Users can easily view all the Models/Classifiers for each Project and Object Types. The Offline Model, Labels, Pre/Post Processor Status is easily viewable. Users can also test this Specific Model for debug purposes. As shown above in the Object Types section, Users can also easily change the Order of Classifier in the pipeline by simple drag and drop.

Test Model

```
{
  "score": 1,
  "result": "go",
  "break": false
}
```

Result & Score returned by the Classifier

Pre-Processor will return an Image. Watson will return with its default format.

Classifier Name:
Rebar Texture Ribs Check

Offline Model: Rebar Texture Ribs Check

Model Format: py

Object Type: Rebar Texture

Image*
 No file chosen

For Post-Process:

Fake Score*

Fake Result*

Test Classifier

Image File to Test

In Case of Post-Processor, as it receives score and result parameter in run() function, this given values will be passed while testing it.

OFFLINE MODELS

Permissions: Admin (All), Project Admin (Only Own)

Type:

- **Pre-Processor** (Python 3 Format, Useful to Process Image e.g. Gaussian Blur/Resize image etc.)
- **Post-Processor** (Python 3 Format, Alter/Calculate: Result & Score or do custom classification)
- **Classifier** (h5, keras, py format which should classify an image and return scores appropriately)
- **Object Detect** (h5, keras, py format which should return detected objects score and bound area)

As we saw in the Models/Classifiers section above, Users can link custom Offline Models to any Classifier. The Offline Model can be of type Processor (Pre/Post), Classifier and Object Detect. A Classifier can only link Processor or Classifier, while Object Detect can be linked to a Project.

The Response and data receivable by Offline Model is predefined and should follow strict guidelines.

Technical Details on creating Offline Model can be found here:

https://www.isac-simo.net/app/offline_model/readme.md

Add Offline Model

Add Offline Model

Home / Add Offline Model

Name* ? Readme for guide and example Name of this Offline Model
This is shown in the Pipeline

Gaussian Blur

Model type* Processor / Object Detect / Classifier

Processor

Model format* .h5 / .keras / .py
(Processor will only accept .py format)

.py (python3)

Choose a format or type yourself

Preprocess Preprocessor / Post Processor
(If the Model Type is Processor)
Mark this Offline Model as Pre-Process (e.g. Gaussian Blur to preprocess the image uploaded)

Postprocess
Mark this Offline Model as Post-Process (e.g. Customize the pipeline result or go/no-go result)

File* Offline Model File itself.
(Remove all unnecessary codes and follow guidelines)

Choose File No file chosen

Add Model

View Offline Models

Users can manage Offline Models and update the model file. If the offline model is python 3 format, users can also check the dependencies used by it. Admin can if required install these dependencies via terminal. And, just like Model and Offline Model can also be tested.

Check all Dependencies used by Python 3 Model Quick Test

Name	Type	Format	Added By	Actions
Rebar Texture Ribs Check	Post-Process ✓	py	Mr. Admin	Delete Edit Download File Test Details
Rebar Texture Rust Check	Post-Process ✓	py	Mr. Admin	Delete Edit Download File Test Details
Rebar Texture Rust Detection	Post-Process ✓	py	Mr. Admin	Delete Edit Download File Test Details

Show 10 entries Search rebar texture

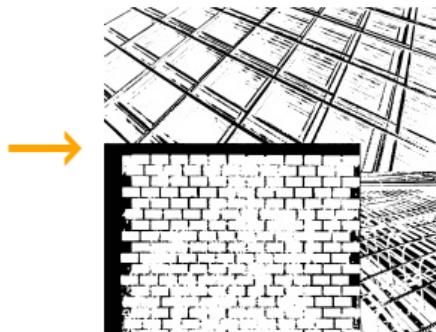
Showing 1 to 3 of 3 entries (filtered from 8 total entries) Previous 1 Next

Post-Process / Pre-Process / Classifier / Object Detect Delete Edit Download File Quick Test

Test Offline Model

This example shows a quick test of a Preprocessor Offline Model. The Preprocessor returns a processed image. Similarly, Postprocessor, Classifier and Object Detection will return certain JSON responses.

Pre-Processed Image:



Offline Model:

Gaussian Blur & Resize

Labels:

Model Format: py

Image*

No file chosen

FILE UPLOAD

Permissions: Admin (All)

Admin Users can Upload other types of Files, Images, Helper Models etc using this file upload feature. After uploading the file, the user can copy the **root path** to that file, which can be used inside of the pre/post processor, classifiers etc. Also, users can share the file as normal web url.

⚠ Other users can use the root path inside offline models, but will not have file upload access.

Upload File

Name*

→ Name of File

File*

Choose File No file chosen

→ File to Upload (100 MB Limit)

Upload Files like Unet Models etc. here & use this path in pre-processor or post-processor

Upload Files like Unet Models etc. here.
Then path can be used in pre-processor or post-processor.

Upload

Clear 

View Files

Show 10 entries			Search:
Name	Added By	Actions	
Unet Brick Segmentation	Mr. Admin	   	
Showing 1 to 1 of 1 entries			

Download File

Copy Root Path

i.e. the path to use inside classifiers, pre/post processor etc.

USERS

Permissions: Admin (All), Project Admin (View/Edit Lower Level User Only)

Add User

Admin or Project Admin can create/edit or register users themselves. Admin can assign the user to any Project, while Project Admin can assign users to their own Projects only. Project Admin will only have view and edit access to the users (But not Admin Users).

⚠ Note that Newly registered Project Admin must be Verified by Admin before they login.

- User (Own Image Access)

- Engineer (Full Image Access)

- Government (Full Image Access)

- Project Admin (Project Level Access) ←

Link User to Multiple Projects ←

Email*

Full Name

Profile Picture

Choose File No file chosen

Password*

- Your password can't be too similar to your other personal information.
- Your password must contain at least 8 characters.
- Your password can't be a commonly used password.
- Your password can't be entirely numeric.

Password confirmation*

User type*

User

Choose User Type Wisely

Projects

Global Guest Project

Object Detection Models

Earthquake Damage Check

Register User

View Users

Here, Admin will have full control over all users. But, Project Admin can edit and assign users (Non admin) to their projects; but cannot delete the users.

[Edit User & Link Projects](#)

[Delete User](#)

#	Name	Email	Type	Projects	Image	Actions
1	John Doe	john.doe@example.com	Project Admin	> Colombia Project > Earthquake Damage Check	View	
2	Foo Bar	foobar@example.net	User	-	View	
3	Tom	tom@email.co.uk	Project Admin	> Colombia Project	View	
4	Mr. Admin (You)	admin@example.com	Admin	*	View	

Show 10 entriesSearch:

Previous1Next

All Linked Projects

If No Projects Linked then Global Guest Project can be used if it exists.



IMAGES

Add Images

Images can be tested with Mobile Applications or APIs. But, Admin also has Dashboard access to Add and Test Images. Any Image can be tested by choosing a **Project** or an **Object Type**. If the Project is chosen then the Object Detection Model linked in the Project will be used to detect the Object Type and is passed through the Classifier Pipeline. Similarly, if Object Type is chosen then this is passed through the Classifiers in this object type (without caring about the project).

Title

Title for these Images | Not Required

Description

Descriptions | Not Required

Latitude

GPS Latitude | Not Required

Longitude

GPS Longitude | Not Required

Multiple Images

No file chosen

Multiple Images to Test

Project

Select a Project

Link this test to a Project | Not Required

Object Type

Select to force an Object Type

Force to use certain Object Type | Not Required

Adding As: [Mr. Admin](#)

Add Image

⚠ You Can Choose an Object Type to Force and use that type (Or Else object detect model from chosen Project is used to detect the object in the given image)

View Images

Admin can View and Manage all Images. Project Admin can manage images linked to their Projects only. Government & Engineer can view linked Project Images. Normal Users can only Manage their own Images. **Here, in the Image View page a quick preview of Image, and its result and score can be viewed by clicking over the number list.**

The Border of Number list suggests; Green is **Go**, Red is **No Go** and Orange is **No Result**.

Edit / View Test Result and Details								Delete Test and all its Images	
								Search: <input type="text"/>	
Show 10 entries									
Id	Title	Description	User	Project	Image	Actions			
I-151	-	-	Anonymous	Retrofit Assistant	1				
I-149	-	-	Anonymous	Retrofit Assistant	1				
I-146	-	-	Anonymous	Retrofit Assistant	1				
I-145	-	-	Anonymous	Retrofit Assistant	1				
I-144	Wall Check	Testing Wall Facade	Mr. Admin	Global Guest Project	1 2 3 4				
I-143	-	-	Anonymous	Retrofit Assistant	1				

Showing 51 to 60 of 191 entries

Previous 1 ... 5 6 7 ... 20 Next

Added By
(Can be Anonymous User via Mobile Applications)

Images with Result & Score

View Image Test Result

Inside the Update Image page, you can see Test Results at the bottom. Clicking on Images will Popup the Image and show brief Result, Score and Object Detected. By clicking the Info/Review icon, we can see detailed score and result for each Pipeline along with the ability to verify the result.

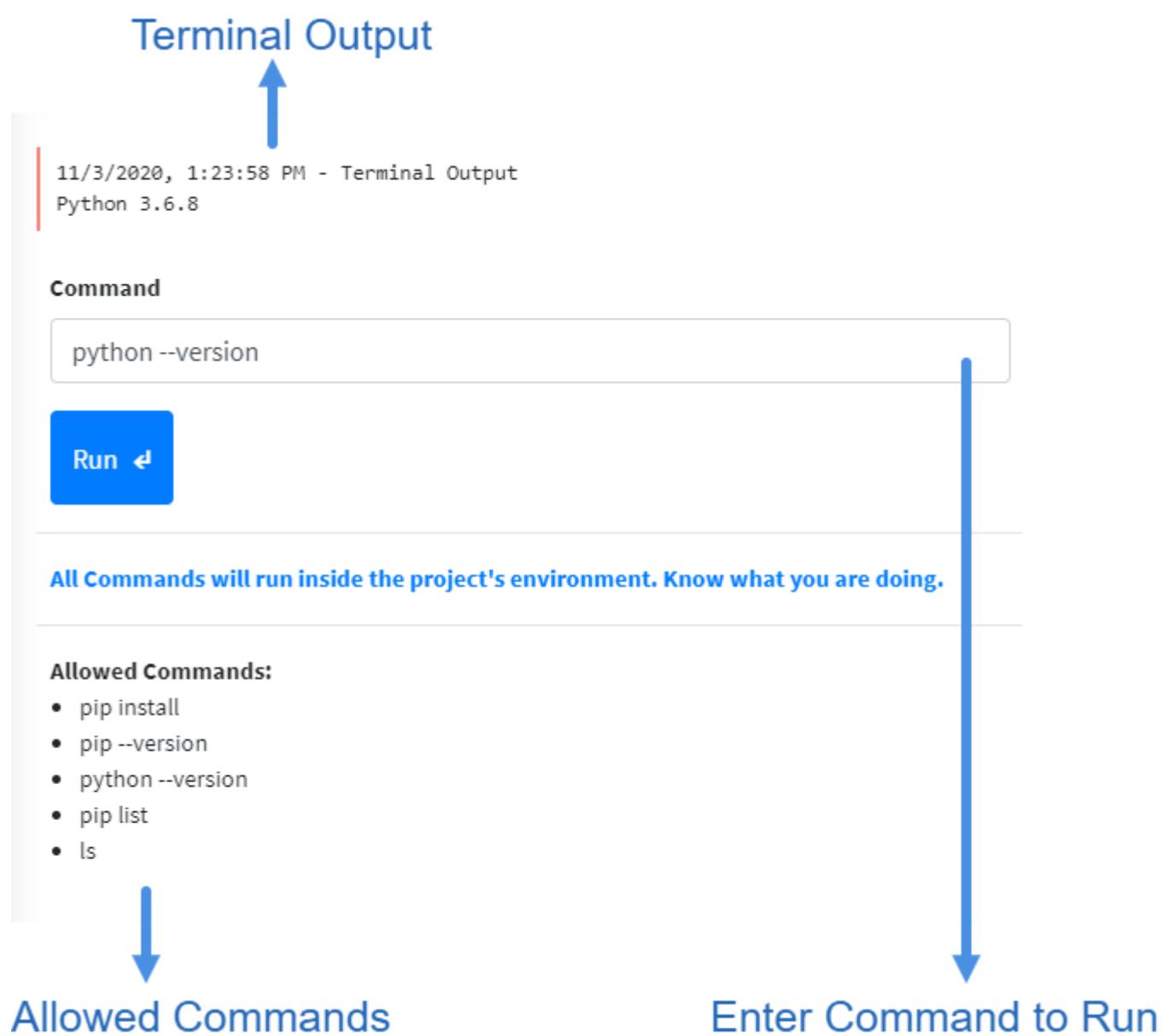
Verify Test Results - 159

	Result: Go
	Score: 1.0
	Object Type: wall bond pattern
<input type="checkbox"/> Verified:	<input type="checkbox"/> Retrained: No
Pipeline Status:	
Model: Force Object Type, Result: wall bond pattern, Score: 1	
Model: UNET Brick Pre-Processor, Result: Pre-Processed Success, Score: 1	
Model: UNET Wall Post-Processor, Result: Go, Score: 1	
	<input type="button" value="Update"/> <input type="button" value="Close"/>

TERMINAL

Permissions: Admin (All)

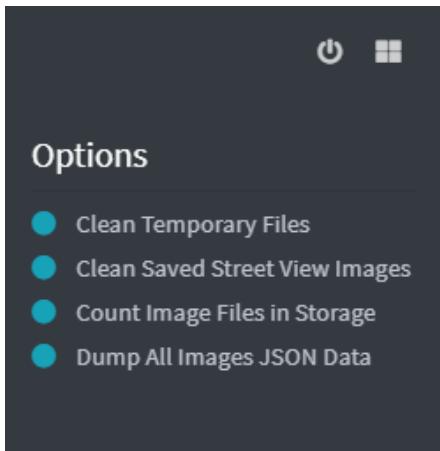
Admin has the ability to run some commands like; install python packages, list packages installed etc. If an offline classifier or processor needs a specific package or library, then Admin can install it here. The Terminal Output is visible and all commands are sanitized properly.



MISCELLANEOUS

Right Sidebar

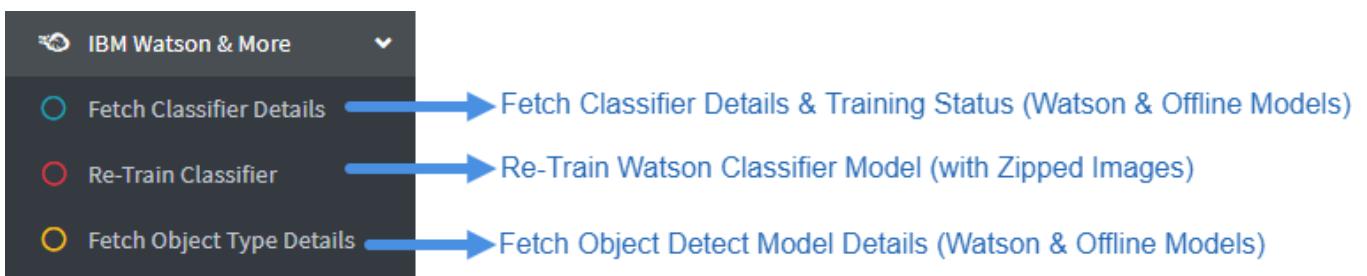
Permissions: Admin (All), Project Admin (Dump JSON Image Data)



IBM Watson & More

Permissions: Admin (All), Project Admin (Linked)

Feature Includes; Retraining Classifiers, Fetch Classifier Details & Training Status, Fetch Object Type Details & Status and View Offline Model Details.



Example Response for Fetch Classifier Details:

Result:

Project: Global Guest Project-1
Object: Rebar Shape
Model: rebarshapesclassifier_166863088

```
{  
    "classifier_id": "rebarshapesclassifier_166863088",  
    "name": "rebar shapes classifier",  
    "status": "ready",  
    "owner": "010054b8-b373-4346-9973-19137dbbd6bb",  
    "created": "2020-07-09T19:04:06.169Z",  
    "updated": "2020-07-14T22:40:28.561Z",  
    "classes": [  
        {  
            "class": "Go"  
        },  
        {  
            "class": "No Go"  
        }  
    ],  
    "retrained": "2020-07-14T22:40:28.561Z",  
    "rscnn_enabled": false,  
    "core_ml_enabled": true  
}
```

Crowdsource Image

Permissions: Admin (All), Project Admin (All), User (Own)

The Crowdsource Feature allows anyone to upload multiple images of different Object Types. These uploaded Images can be used while Training different Models by the Admin or Project Admin. The User who uploaded the images, must confirm that they are willing to transfer the Copyright to ISAC-SIMO & agree that it can be used and shared freely.

Contribute to Crowdsource

Object type*

Other

Image type*

Raw

Multiple Files*

Choose Files No file chosen

Only Upload Files of Chosen Object Type and Image Type.

Upload ↗ **Clear ✖**

All Images Copyright will be transferred to ISAC-SIMO.
 You agree that it can be used and shared freely.

Uploading new Contribution from Backend.

Total Crowdsource Images: 4				
Actions		Search: Press Enter to Search		
	Download Images	Image Type	Attribution	Actions
	<input type="button" value="Delete Images"/>	Processed	Charles W.	 
<input checked="" type="checkbox"/>	Rebar Hooks Detection	Raw	Mr. Admin	 
<input checked="" type="checkbox"/>	Rebar Rust Detection	Raw	Mr. Admin	 
<input type="checkbox"/>	Facade Wall	Raw	Mr. Admin	 

Page 1 of 1 (Total Items 4) **Previous** **1** **Next**

View / Manage Contribution Images.

Images can be uploaded from the ISAC-SIMO Mobile Application. Similarly, any application can implement the API to integrate crowdsource functionality.

Public Projects

Permissions: Admin (All), Project Admin (Own), User (View/Join/Contribute)

This feature allows Admin & Project Admin to easily upgrade and share Projects publicly. To share the Project, and make it available to see and contribute by other users, it must be marked as Public (via the Project Create/Edit form)

Is Publicly Visible

Choose if you want this Project to be Publicly Available to any user. Anyone can join the project or contribute.

After the Project has been marked as Public, it will immediately be visible in the Public Projects Page and users can view the Project Details and Join the Project themselves.

The screenshot shows the 'Public Projects' page. At the top, there are buttons for 'Only Show Joined Projects' and 'Add New Project', and a search bar with placeholder text 'Press Enter to Search'. Below this is a table with two rows of project data. The first row contains project #2, 'Rebar Evaluation Project', with a blue 'View More' button and a blue 'Joined' button with a checkmark. The second row contains project #5, 'Nepal Retrofit Project', with a blue 'View More' button and a green 'Join' button. At the bottom left, it says 'Page 1 of 1 (Total Items 1)'. At the bottom right, there are navigation buttons for 'Previous', '1', and 'Next'.

Id	Name	
#2	Rebar Evaluation Project	i View More Joined
#5	Nepal Retrofit Project	i View More Join

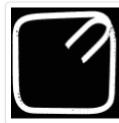
The Public Projects can be searched by Name, Description & Linked Object Types. Users can filter to show only the Joined Projects as well. It also conveniently shows the option to Join/Leave any Project. After the user Joins the Project, they will see the object types from this project in the list on the mobile application.

By clicking on the “View More” button, users can view the Object Types linked to this project as well as the Classifier Pipeline used to test the objects. They can view the Classifier Information and even download the Offline Model if it exists.

Rebar Evaluation Project

[Home](#) / [Public Project Info](#)

Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat. Duis aute irure dolor in reprehenderit in voluptate velit.



Online Detect Model: Yes

Offline Detect Model: No

✓ Joined

Object Types:

Search: Filter Object Type / Classifier

Rebar Texture

Order	Name	Type	Actions
1	Rebar Texture Rust Check	Post-Processor ✓	
2	Rebar Texture Ribs Check	Post-Processor ✓	

[View Contributions](#)

Rebar Hooks Detection

Order	Name	Type	Actions
0	908b69dc-4b10-4e8a-Be61-2469c99838f2	Watson Object Detect Model	

[Contribute](#) [View Contributions](#)

It also shows if the Classifier is Watson Model or not, as well as if it is Post-Processor, Pre-Processor, Detect Model, Watson Classifier or Local Classifier. The Search option allows you to filter by query.

Here, if Admin or Project Admin has marked any Object Type as “Wishlist” then the Contribute button will be visible. To Mark Object Type as Wishlist it can be done from Object Types Page and clicking on the little “Add to Wishlist” (Bookmark Icon) button.

Note that, this can only be done if the Project it is linked to is marked as Public

Rebar Texture	Object Detection Models	Mr. Admin	
Rebar Hooks Detection	Object Detection Models	Mr. Admin	

To Contribute, as mentioned above, users can click the Contribute button (Also available inside View Contribution Page). To Contribute, the form should be filled with Title, Description explaining the contribution itself. And, can also include one file (zipped multiple files) with required documents and models. After the Contribution has been submitted, the Admin or Project Admin of that particular Project can review the contribution and can mark it as “Helpful”. Other users can then view all Helpful Contributions along with their own. (And Edit or Delete their Own Contribution if required)

Admin or Project Admin can also temporarily unmark Project as Public to stop receiving contributions. But, they will still be able to manage old contributions. (Unless removed from the Project)

Contribute to Rebar Hooks Detection



Rebar hooks detection description. Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Ut enim ad minim veniam, quis nostrud exercitation.

Title*

Contribution Title

Description*

Brief Description

Describe the Contribution, linked files and why it should be considered.

File

No file chosen

Only Submit One Zipped File. (File is Optional if you think description is enough.)

The Contribution Form.

Contributions for Rebar Hooks Detection - Object Detection Models

Total Found: 1

Search: Press Enter to Search

	Title	File	Submitted By	Actions
<input type="checkbox"/>	Test: My New Contribution		Mr. Admin [YOU]	

Page 1 of 1 (Total Items 1)

Previous Next

View Contributions.

Is Helpful

Mark this Contribution as Helpful. So that other users can see and download it.

Mark Contribution as helpful (By Admin or Project Admin)

Integration with External Application

ISAC-SIMO API is a fully featured rest service which allows other applications to use that public api to add, edit and manage data and records externally. Learn more about the API provided by ISAC-SIMO in [Mobile Api Guide](#).

This examples below shows a demonstration on how we can easily integrate ISAC-SIMO into different applications:

KoboToolbox

KoboToolbox (kf.kobotoobox.org) has a feature called **Rest Services** which allows us to integrate ISAC-SIMO with which it calls our API on each new submission added to the kobo form.

First, we need to make sure that the form contains Photo input with the data column name set to "isac_image_xxxx" where "xxxx" can be a unique identifier. The Form can contain multiple ISAC-SIMO test-able image upload fields with "xxxx" being unique for each field. If you want to receive back the ISAC-SIMO test result and store it in a field in the kobo submission record, a read-only text input field with data column name "isac_result_xxxx" can be created. The "xxxx" value must be the same as the image upload field.

The screenshot shows the KoboToolbox configuration interface for a question. The question title is "* ISAC SIMO Test Image". The left sidebar has tabs for "Settings" (selected), "Question Options", "Skip Logic", and "Validation Criteria". The "Settings" tab contains fields for "Data Column Name" (set to "isac_image_1") and "Guidance Hint". Below these are "Mandatory Response" options: "Yes" (radio button selected) and "No". The right side of the interface includes a toolbar with icons for settings, delete, copy, and paste.

Example we can have: "isac_image_1" as photo upload field and "isac_result_1" as the input field to store the result. When uploading, make sure that the isac_result_xxx field is not empty (e.g. add N/A as default value).

Edit REST Service

Name
ISAC-SIMO Webhook

Endpoint URL
https://www.isac-simo.net/api/kobo/?object_type_id=1&token=64afdd260e8f2

Enabled

Receive emails notifications

Type
 JSON
 XML

Security
No Authorization

Select fields subset
Add field(s)

Custom HTTP Headers

Accept	application/json	
+ ADD HEADER		

In the Kobo Rest Service we can then use the following endpoint.

https://www.isac-simo.net/api/kobo/?object_type_id=<check_id>&token=<kobo_token>

The **object_type_id** value should be the ID of the chosen check (can be found in isac-simo dashboard). And, the **token** should be the Kobo Toolbox auth token that can be found in Account Settings of Kobo user dashboard. Domain used by ISAC-SIMO for sending back the result is <https://kc.kobotoolbox.org> by default. If you want to change the domain and use your custom server then provide a domain query parameter. The domain in the query parameter must NOT have ending slash.

The test result can be viewed in ISAC-SIMO Dashboard with description set to “KoboToolbox / ID”. You can search by _id value here.

Id	Title	Description	User	Project	Image	Actions
I-941	-	KoboToolbox / 9501614	Anonymous	GLOBAL		

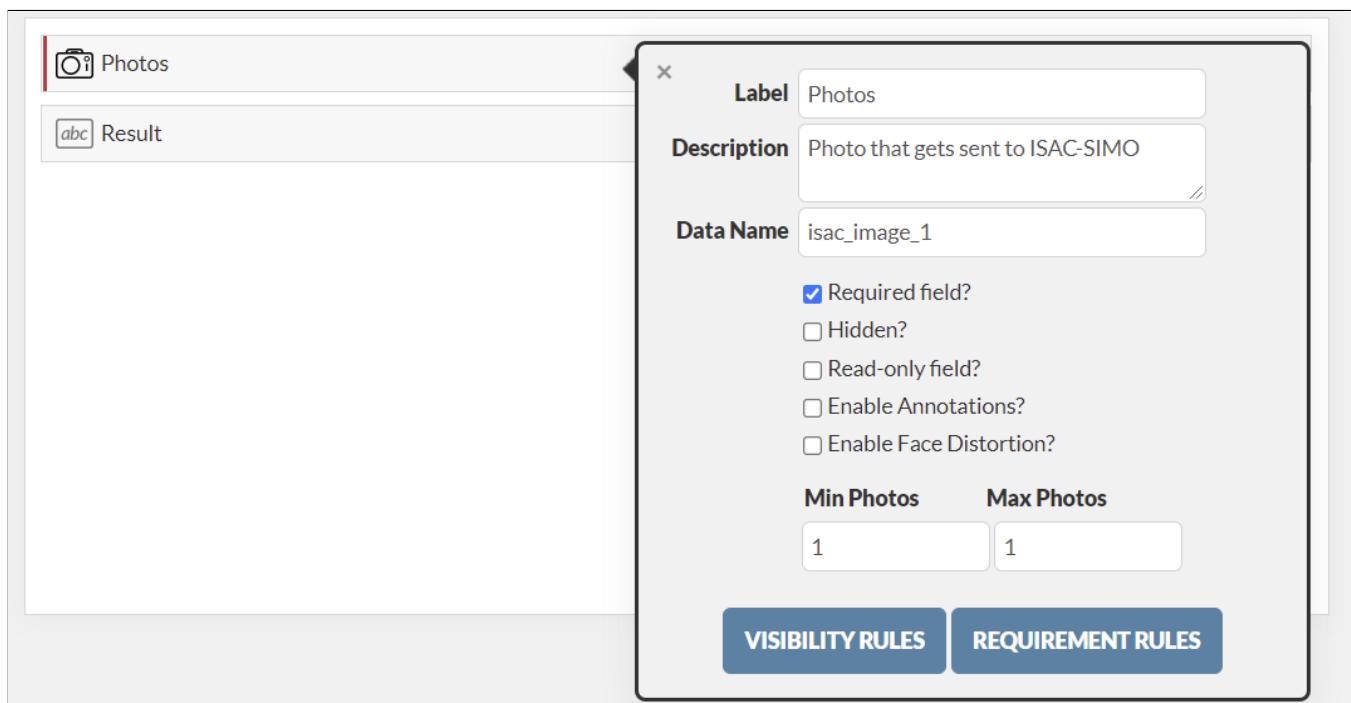
And, if “isac_result_xxxx” is valid then the result field will be set in kobo toolbox data also. It might take a few minutes for it to update / sync.

Fulcrum

Fulcrum is a popular Data Collection application that has a wide range of features. Integrating ISAC-SIMO into any Fulcrum project is pretty straight-forward. Most of the logic and standard are similar to that of the KoboToolbox method mentioned above.

First, we need to make sure that the form contains a **Photos** field with the data name set to "isac_image_xxxx" where "xxxx" can be a unique identifier. The photo field for faster performance should have a single maximum photo allowed. The Form can contain multiple ISAC-SIMO testable photo upload fields with "xxxx" being unique for each field. If you want to receive back the ISAC-SIMO test result and store it in a field in fulcrum record, a read-only or hidden **text input** field with data name "isac_result_xxxx" can be created. The "xxxx" value must be the same as the image upload field.

Example we can have: "isac_image_1" as photo upload field and "isac_result_1" as the input field to store the result.



Fulcrum has a feature called "Webhook", with which on any event like; create, edit etc. fulcrum can call ISAC-SIMO API with form data. ISAC-SIMO performs tests on photos if valid data names are provided and updates the record if valid data name for result field is provided.

[https://www.isac-simo.net/api/fulcrum/?object_type_id=\[check_id\]&token=\[kobo_token\]](https://www.isac-simo.net/api/fulcrum/?object_type_id=[check_id]&token=[kobo_token])

Name	ISAC-SIMO Caller
URL *	https://www.isac-simo.net/api/fulcrum/?object_type_id=1&token=1d32c1026
<input checked="" type="checkbox"/> Active?	
CANCEL	SAVE CHANGES

The **object_type_id** value should be the ID of the chosen check (can be found in isac-simo dashboard). And, the **token** should be the Fulcrums API token that can be found in the Settings / API section of the dashboard.

The test result can be viewed in ISAC-SIMO Dashboard with description set to Fulcrum / ID". You can search by id value here. Any recurring webhooks with the same ID are ignored by rate-limiting.

I-950	-	Fulcrum / 721c57c0-6827- 4b21-b1fe- b28c0f03bbac	Anonymous	GLOBAL	1				
-------	---	---	-----------	--------	----------	--	--	--	--

If "isac_result_xxxx" is valid then the result field will be set in fulcrum data also. It might take a few minutes for it to update / sync.

1 record		SAVE VIEW						
		Title	Updated	Project	Assigned	Updated By	Photos	Result
≡	nogo		5/12/2021, 7:23:50 PM			username		nogo

Any other services can easily integrate ISAC-SIMO using our Restful API service. [Learn More.](#)

Mobile Application

The Mobile application allows users to login, register and take or upload Images of different Objects (Wall, Rebar etc.) to classify it as **GO** or **NOGO**. Guest Users who choose not to login will only have access to Global Guest Project and its Object Types (If they exist). Otherwise, logged in users will only have access to Projects and the Object Types they are linked to.

LOGIN & REGISTER

WELCOME TO ISAC-SIMO

Skip Authentication OR SIGN IN

Email*

Password*

Login

Don't Have an Account? [Sign up](#)

Continue as Guest User
No Authentication Required
Will only have access to Global Guest Project

Enter Login Credentials

Register as "User"

CREATE ACCOUNT OR

Skip Authentication

Name*

Email*

Password*

Sign Up

Already Have an Account? [Login](#)

Continue as Guest User
No Authentication Required
Only Access Global Guest Project

Choose Profile Picture

Enter User Details

PROFILE

The Profile tab shows the logged in users Name, Email, Profile Image and option to Logout. Guest users will be considered a temporary Anonymous User.

PROFILE



Name : Mr. Admin

Email : admin@██████████

Logout

AppVersion : 1.0.0

 HOME  PROFILE

HOME

The Home Tab is the Mobile Dashboard. There are Information, Report and Quality Check Options that can be clicked. **Quality Check** is the main option where users can test images of different objects and view the result.

DASHBOARD



INFORMATION



QUALITY CHECK



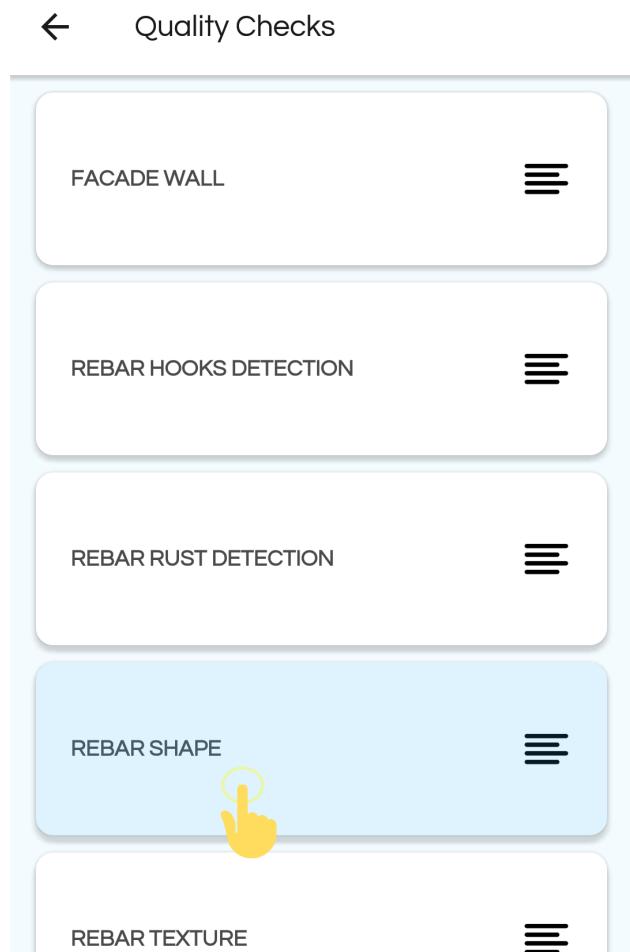
REPORT

 HOME  PROFILE

QUALITY CHECK

As mentioned multiple times above, Guest Users who choose not to login will only have access to Global Guest Project and its Object Types (If they exist). While, logged in users will only have access to Projects and the Object Types they are linked to. This Quality Checks page lists all the Object Type users can test by taking photographs.

First, Choose the Object Type for which to perform a quality test. In the image below, users may choose Facade Wall, Rebar Shapes etc.



For this guide, let's choose Rebar Shape. Clicking on Rebar Shape in the list will open another page that shows Instruction and a Sample Image on how to properly capture the Image. Following the instruction will make sure that the result will be better and accurate.

Next, you can click on the "**Let's Go**" button to capture or upload images for testing. The Uploaded image will be passed through all Classifiers/Models Pipeline that is linked to the chosen Object Type. Before uploading users can crop & edit the images.

REBAR SHAPE INSTRUCTIONS

The picture should look like this:



Place a rebar tie element on the ground or a flat surface, and take a picture from the top as shown in the example image

REBAR SHAPE INSTRUCTIONS

The picture should look like this:



Place a rebar tie element on the ground or a flat surface, and take a picture from the top as shown in the example image

Select Photo

Click a Photo



Import from Gallery

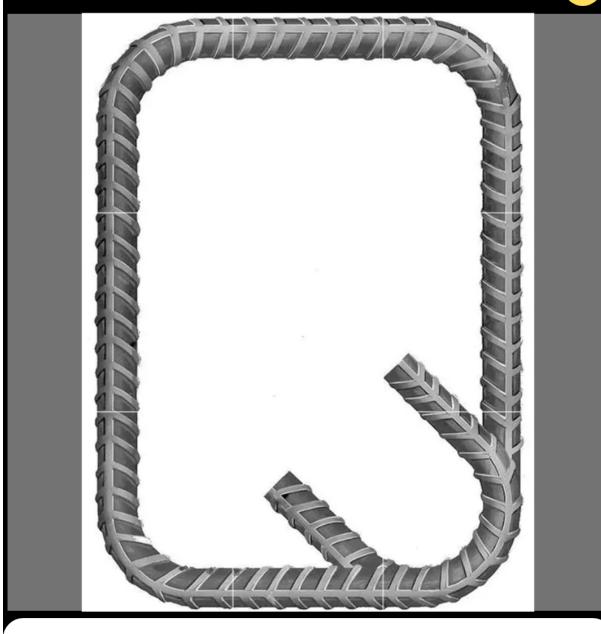
< Go Back

Let's Go >>

Cancel

Make sure to Crop the Image so that the Object is centred and no other obstruction is visible. The image brightness, contrast, hue etc. can be easily adjusted in the next screen.

X Edit Photo



1:1

3:4

ORIGINAL

3:2

16:9

Crop



CAPTURED IMAGE



exposure

brightness

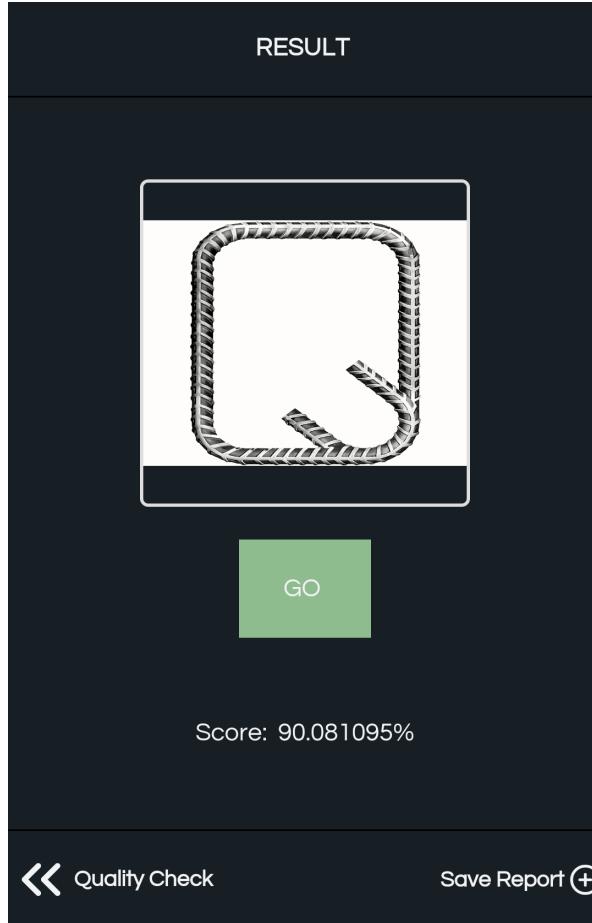
contrast

satu

Submit



After clicking the “Submit” button the Image is sent and processed by the server. And the result and score is shown. Results can generally be Go, Nogo or No Result and score are generally 0 to 100 percent. Score is the confidence level on the result. For Example, if the result is “GO” and the score is 90% like below, then it suggests that the Image passed with 90% confidence. (i.e. the Image is Okay and in this case Rebar Shape is good)



The Score and Result of all Pipeline is accessible in the Web Dashboard. Here, all Pipeline Classifiers and the score they returned are shown.

Result:
go

Score:
0.90081095

Object Type:
rebar shape

Verified: **Retrained:** No

Pipeline Status:

Model: Force Object Type, **Result:** rebar shape, **Score:** 1

Model: Gaussian Blur & Resize, **Result:** Pre-Processed Success, **Score:** 1

Model: rebarshapesclassifier_166863088, **Result:** Go, **Score:** 0.916

Model: All Detected, **Result:** [View](#) | [Copy](#)

Model: 908b69dc-4b10-4e8a-be61-2469c99838f2, **Result:** u-hook, **Score:** 0.8856219

Model: Rebar Shape Post Process, **Result:** go, **Score:** 0.90081095

Getting Started

This section will guide you through the steps to create a simple Project with Rebar Shape Quality Checker. It will cover creating a project, adding and linking a classifier, adding and linking a offline model, ordering the pipeline and testing an image via mobile application.

STEP 1 - REGISTER AS PROJECT ADMIN

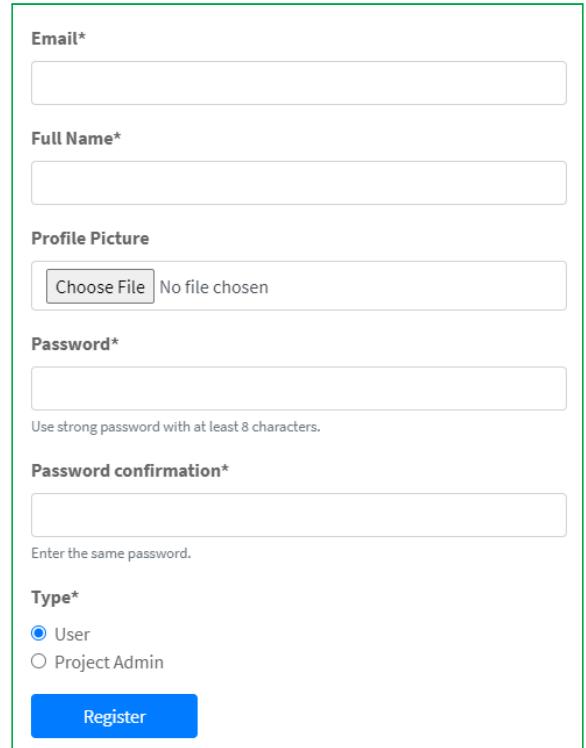
[More info on Login & Register](#)

In the Registration page fill up your Details, Email and Password. Then, choose Type as “**Project Admin**” so that you can create and manage projects and models.

A Project Admin will have access to other user details, so the user must be first verified by an Admin. Wait for Admin to verify your account, so that you can login. After the account is verified you can login and access the Dashboard.

You can also register as Type “**User**” if you want. But, you can only test images after you are linked to a Project by Admin or Project Admin.

Note: Password needs to be strong with Upper Case, Numbers and Special Characters.



The registration form for a Project Admin is shown in a green-bordered box. It includes fields for Email*, Full Name*, Profile Picture (with a 'Choose File' button and 'No file chosen' message), Password*, Password confirmation*, and Type*. The Type* field has two options: User (selected) and Project Admin. A blue 'Register' button is at the bottom.

Email*	<input type="text"/>
Full Name*	<input type="text"/>
Profile Picture	<input type="file"/> No file chosen
Password*	<input type="password"/>
Use strong password with at least 8 characters.	
Password confirmation*	<input type="password"/>
Enter the same password.	
Type*	<input checked="" type="radio"/> User <input type="radio"/> Project Admin
Register	

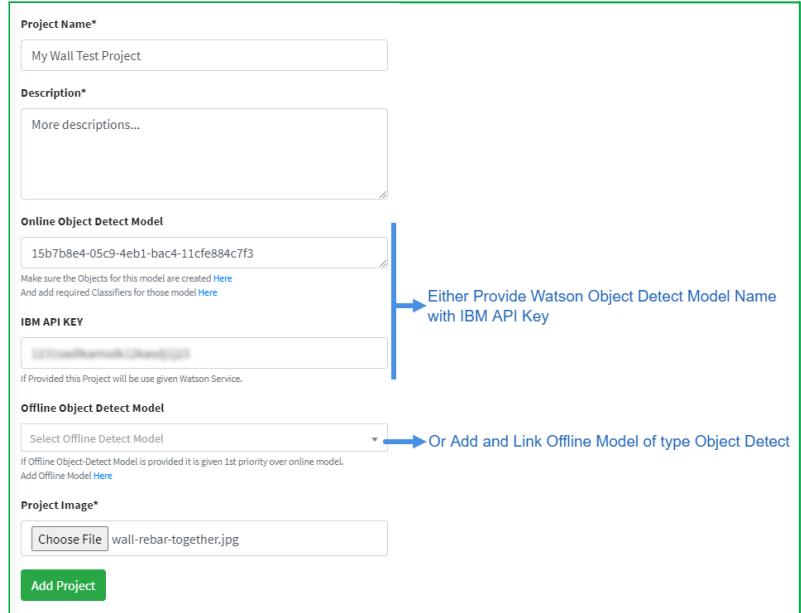
STEP 2 - CREATE A NEW PROJECT

[More info on Projects](#)

As you registered as a Project Admin, you can create and manage multiple projects. From the Sidebar, you can access View Projects and Create Project Page. Lets create a New Project as shown in this Image.

Fill in the Project Name, Description and Image. Now, you can either link a Watson Object Detect Model with IBM API Access Key. Or, add and link Offline Model of type Object Detect.

Then, when testing an image using the API you can choose to force an object type by providing `object_type_id` or choose to use this Project Object Detection Model providing the `project_id`.



The Create Project form is shown in a green-bordered box. It includes fields for Project Name* (My Wall Test Project), Description* (More descriptions...), Online Object Detect Model (15b7b8e4-05c9-4eb1-bac4-11cf884c7f3), IBM API KEY (redacted), Offline Object Detect Model (Select Offline Detect Model dropdown), and Project Image* (Choose File button with 'wall-rebar-together.jpg' message). A blue arrow points from the 'Online Object Detect Model' field to the text 'Either Provide Watson Object Detect Model Name with IBM API Key'. Another blue arrow points from the 'Offline Object Detect Model' field to the text 'Or Add and Link Offline Model of type Object Detect'.

Project Name*	My Wall Test Project
Description*	More descriptions...
Online Object Detect Model	15b7b8e4-05c9-4eb1-bac4-11cf884c7f3
Make sure the Objects for this model are created Here . And add required Classifiers for those model Here	
IBM API KEY	(redacted)
If Provided this Project will be used given Watson Service.	
Offline Object Detect Model	Select Offline Detect Model
if Offline Object-Detect Model is provided it is given 1st priority over online model. Add Offline Model Here	
Project Image*	<input type="file"/> wall-rebar-together.jpg
Add Project	

Now, if you visit the View Projects page you can see this newly created Project with a hint that you need to add Object Types and Classifiers which we will do next. (You can also test linked Object Detect Model)

STEP 3 - ADD OBJECT TYPE

[More info on Object Types](#)

You have created a Project, but you need to add Object Types that this project will test. For Example, in our “My Wall Test Project”, users will be able to test Wall Facade, Wall Bond Pattern etc. These are the Object Types that can be tested. You can view and manage the Object Types as shown in Image below.

The screenshot shows two panels. The left panel is titled 'Create Object Type' and contains a table of existing object types. The right panel is a form for creating a new object type. A blue arrow points from the text 'Object Types Linked to our Project' to the table on the left. Another blue arrow points from the text 'Create/Edit Object Types' to the 'Create Object Type' form on the right.

Fetch Object Type Details from IBM Watson

Show 10 entries Search:

Name	Project	Added By	Actions
Wall Facade Test	My Wall Test Project	Test User	
Wall Bond Pattern Test	My Wall Test Project	Test User	

Showing 1 to 2 of 2 entries Previous 1 Next

Object Types Linked to our Project

Create Object Type

Object Type* wall bond pattern test
Must be unique and lowercase for each project

Project* My Wall Test Project

Instruction Take Image Properly and other instructions....

Instruction Image Choose File No file chosen
Previous: /media/object_types/d047499ee0ff4d77a13181c1aed271f5.png

Update Clear

Create/Edit Object Types

Here, we add Object Types, choose the Project and provide suitable Instruction and Image on how to perform the test. Now, the Classifiers/Models Pipeline for these specific Object Types can be added so that users can test.

STEP 4 - ADD CLASSIFIERS & REORDER PIPELINE

[More info on Models / Classifiers](#)

As we have added the Object Types, when we login from the Mobile Application or use API we can see the option to choose these object types for testing images. Currently, no Classifier/Model has been linked to this Object Types pipeline so the tested result will be empty. So for that, let's start adding classifiers/models. We can add multiple models, watson models, offline models, pre/post processors and order the pipeline appropriately.

For this example, we will add models for “Wall Bond Pattern Test”. We have created two python 3 scripts, one to Pre-Process the Image of Brick Wall and the other to Post-Process and Classify the image and return GO/NOGO Result. As these are Offline Model (Not Watson), we first need to add these in Create Offline Model Page.

[More info on Offline Models](#)

After we have added the Pre/Post Processor appropriately we can quickly test an image and view python dependencies. Make sure that when creating Offline Models, study the Readme guide and view examples. Here, we see that we created one Pre-Processor and one Post-Processor.

+ Add Offline Model						Readme for guide and example
Show 10 entries						Search:
Name	Type	Format	Added By	Actions		
UNET Brick Pre-Processor	Pre-Process ✔	py	Test User	Delete Edit Upload Run View		
UNET Wall Post-Processor	Post-Process ✔	py	Test User	Delete Edit Upload Run View		

Showing 1 to 2 of 2 entries

Previous 1 Next

Now, finally we can create a Model/Classifier and link these offline models. You could ofcourse use Watson Model or Train yourself with Images. In the create form choose the Source of Model, fill the form as required and set the order in which to run.

Source of the Model*

Offline Model

Offline Model

Unet Brick Pre-Processor - py - (Pre-Process) x ▼

If Offline Model is added it is used with 1st priority

Classifier Name*

UNET Brick Pre-Processor

Project*

My Wall Test Project x ▼

Links Classifiers to specific Project

Object Type*

Wall Bond Pattern Test ▼

Select the Object Type for which to create this classifier.
To Create new Object Type [Go Here](#)

Order*

1

Create Classifier

Pre-Processor

Source of the Model*

Offline Model

Offline Model

Unet Wall Post-Processor - py - (Post-Process) x ▼

If Offline Model is added it is used with 1st priority

Classifier Name*

UNET Wall Post-Processor

Project*

My Wall Test Project x ▼

Links Classifiers to specific Project

Object Type*

Wall Bond Pattern Test ▼

Select the Object Type for which to create this classifier.
To Create new Object Type [Go Here](#)

Order*

2

Create Classifier

Post-Processor

If you want to easily change the order of the pipeline (Very useful for multiple pipelines), you can do so in the Object Type List View by clicking the “**Quick Order Classifier Icon**”.

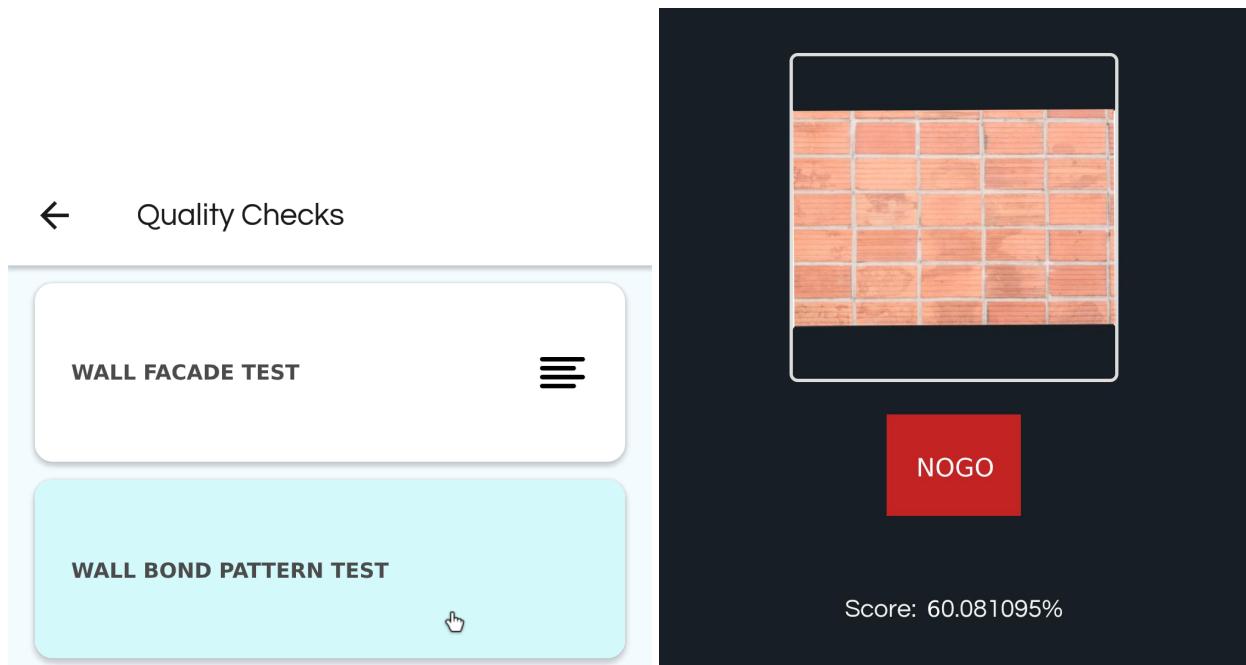
Wall Facade Test	My Wall Test Project	Test User	
Wall Bond Pattern Test	My Wall Test Project	Test User	

There you can drag and arrange the Model and Classifiers easily.

STEP 5 - TEST WITH MOBILE APPLICATION

Now, login from the Mobile Application, inside Quality Check you should be able to see “Wall Bond Pattern” in the list. Click the item, upload or capture an image of a brick wall and send to test. If all the Classifiers ran successfully, then it should return the GO/NOGO response.

[More info on Mobile Application](#)



After the test, you can also view the result and pipeline specific output in the View Images/Edit/Info page from the web application.

You should now be able to add other users, link to your project, create multiple object types, classifiers, models and perform checks easily.

Visit [ISAC-SIMO](#) to get started.

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