SHERLOCK & CRIMINALS

Powered by IBM Watson

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INTRODUCTION

Hi Everyone! I'm Sherlock Holmes, the so-called detective. You can find me on the address, "221B Baker Street". I was born with supernatural powers to find suspicious faces from a hoard of people. Do you want to know the secret of mesmerizing detective skills? Apparently, you know it. Yes, you guessed correct. It's IBM Watson. IBM Watson powered me with skills to extract out suspicious faces from images, analyse them, score them with respect to criminals and tell the results. Any help from my side, consider I'm always there.

ABOUT US

- IBM HACKATHON
  Criminal Detector is a project under IBM Hackathon Event that we call as "Sherlock" as it takes help from “Watson”.

- OUR MOTTO
  A project by final year CSE students of VNIT for IBM Hackathon to absorb the experience of IBM Watson & Bluemix.

- OUR POWER
  Visual Recognition, AlchemyAPI are the source of our power to develop Sherlock. It has the capability to learn from past events.

FEATURES

- RESPONSIVE
  Sherlock & Criminals is a Mobile/Tablet/Desktop responsive webapp.

- UPLOAD IMAGE
  An image containing group of people/single person/no person for classification is uploaded.

- EXTRACT FACES
  Faces are extracted from the uploaded image.

- CLASSIFY FACES
  Extracted faces are classified based on our classifier.

- SCORE FACES
  Extracted faces are scored based on similarity of the faces with existing classes in the classifier.

APIs/TECHNOLOGIES INVOLVED

- AlchemyAPI
  For extracting faces from an image containing single person/group of people.

- Visual Recognition API
  A classifier is trained for a specific set of images of certain people. Visual Recognition powers us to get an insight into the classifier to generate scores for faces extracted using Alchemy API.

- Backend-Technologies
  - ✓ Server deployed on IBM Bluemix using liberty-java.
  - ✓ Jersey framework adopted for handling backend processing.
  - ✓ JSON for parsing the JSON results obtained from Visual Recognition API.

- ✓ JAVA I/O for handling the processing of Images uploaded to generate required formats for IBM Watson AlchemyAPI & Visual Recognition API.

- Frontend-Technologies
  - ✓ AJAX
  - ✓ JQUERY
  - ✓ JavaScript
  - ✓ HTML, CSS

CHALLENGES FACED

- Latest version of java-sdk had issues with "okhttp" due to which deployment caused "Unable to accept protocol Error". This was a recent error faced by IBM, dated 17 Mar 2017. Tried to change to open-jdk but doesn't work. Found solution to this issue by rolling back to older version of liberty-java.

  ISSUE LINK: WatsonServices: Unable to find acceptable protocols

- Free version's limitation on Visual Recognition API: Updating a classifier/adding more images to a class/adding more classes is not allowed.

- Multiple deployment on IBM Bluemix sometimes causes the server to do same deployment process again & again without success.

- Submitting multi-part/form data from front-end to back-end technologies through AJAX was difficult task involving to know about content-type & process-data in AJAX to force stop passing a string.

- Free version's limitation on image size for AlchemyAPI (1 MB size limit) which restricts uploading high definition group images for better quality face extraction.

FUTURE SCOPE

- With the upgradation to premium version which facilitates upgrade classifier feature and no limit on the size of the uploaded image, the classifier can be modified such that it trains itself with each high-resolution test image, improving itself automatically for better classification.

- A surveillance system can be built using this concept which will detect the criminals in real time and alert the control room if the suspect is spotted. (An extension of the current project)

- Our application can also be used in various other scenarios:
  - ✓ Attendance Marking System
    A camera is installed in a classroom & captured image marks the attendance.

  - ✓ Automatic Sign-in System
    The ID Card Authentication system can be replaced with this face detection system which reduces the hassle of carrying an ID Card all the time.