Comprehensive Design and Analysis Project (IT 405)

Group Assessment File

Project ID: 19_20-J 17

Supervisor: Ms. Suranjini Silva

Project Title:

Document Reading System for Blind People ("*Reading-Eye*")

Group Details:

Student ID	Student Name
IT16102156	E.M.D.D. Ekanayake
IT16176348	I.N. Kalansooriya
IT16165762	P.S.N. Kularathne
IT16079328	W.R.P. Fernando

Comprehensive Design and Analysis Project (IT 405)

Student Assessment File

Project ID: 19_20-J 17

Student ID: IT16102156

Student Name: E.M.D.D. Ekanayake

Research Domain: Assistive Technology

Project Title

Document Reading System for Blind People   ("*Reading-Eye*")

Project Sub Title

Analyzing and Describing Text with Creating the Mobile Application.

Individual Component Abstract

- ▪ Develop a user-friendly cross-platform mobile application for vision-impaired people.

  - • Analyze captured photos and auto-rotate the image in the actual direction where the captured image should be in the actual position.
  - • Make the single command to start analyzing.
  - • Make the option after analyzing the document auto play starts and the user able to listen to the document.

- ▪ Identify **text, images, charts, tables, and the equations** uniquely and create another digital image for different identical matches.

- ▪ In text - Identify language patterns and create a detailed description.

- ▪ Generate a JSON file of that detailed description for the user to listening purpose.

- ▪ Concatenating all JSON files and generates a single audio clip using open source API service for the user to listen.

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Student Assessment File

Project ID: 19_20-J 17

Student ID: IT16176348

Student Name: I.N. Kalansooriya

Research Domain: Assistive Technology

Project Title

Document Reading System for Blind People ("*Reading-Eye*")

Project Sub Title

Create an Algorithm to Encrypt and Reduce the Size of the Images.

Individual Component Abstract

- Create an algorithm to reduce the size of the images, remove noises and preprocesses to get meaningful information.

- Create an encryption algorithm to make the assurance of the communication. The encryption algorithm must include the following properties.
    - High efficiency
    - Resistant to brute force attacks

- Use the **Diffie-Hellman** algorithm for the secure key exchange to make key exchange much more secure and reliable.

- Use randomly generated 256-bit long secret key and embed it into the application to make key storage much more secure.

- Enforce cloud policies to safeguard and handle the process according to the standards and best practices.

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Project ID: 19_20-J 17

Student ID: IT16165762

Student Name: P.S.N. Kularathne

Research Domain: Assistive Technology

Project Title

Document Reading System for Blind People

("*Reading-Eye*")

Project Sub Title

Analyzing and Describing Charts and Equations in the Documents.

Individual Component Abstract

- Detect charts, equations in the uploaded digital photos of the document.

- In charts - Identify the **type** of the charts as,
    - Line charts
    - Bar charts
    - Pie charts etc.

- Represent the relevant data of the charts accordingly by using natural language processing and deep learning techniques

- In equations - Identify **numbers, variables, and operators** in the complex equations accordingly using neural networks and machine learning techniques.

- Create a detailed description of the identified content of charts and equations.

- Generate an audio file of that detailed description for the user to listening purpose.

Comprehensive Design and Analysis Project (IT 405)

Student Assessment File

Project ID: 19_20-J 17

Student ID: IT16079328

Student Name: W.R.P. Fernando

Research Domain: Assistive Technology

Project Title

Document Reading System for Blind People   ("*Reading-Eye*")

Project Sub Title

Analyzing and Describing Images and Tables in the Documents.

Individual Component Abstract

- Detect images, tables in the uploaded digital photos of the document.

- In images - Identify **objects, people, places, actions and background regions** in the image using deep learning techniques.

- In tables - Identify **columns and row data** in tables accordingly and analyze the content.

- Create a detailed description of the content that was identified for both images and tables. If the system identifies a white dog in an image, it will create a description of that like "This is an image of a white dog".

- In case of failure to identify, the system will respond to the user saying, "I cannot understand what that image is". This is because there will be situations where the system cannot accurately identify the image.

- Generate an audio file of that description for the user to listening purpose.