

Full-Stack Web Development

for Auto-Assessment Platform (AASP)

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Demo

Live demonstration

The background is white with several large, semi-transparent blue and yellow circles scattered around the edges. A small blue circle is in the top left, a yellow circle is in the top right, and a large blue circle is on the far right. A large yellow circle is at the bottom center, and a small blue circle is at the bottom right.

01 Introduction

Background

Manual grading of assessments

- Tedious and time consuming
- Prone to mistakes and bias

Benefits of online assessment platforms

- Automated and consistent grading
- Not reliant on physical venues and invigilators to administer tests



Blackboard



Prior Work



Kenneth Soh

- Designed and developed AASP

Yap Guan Sheng

- Added MCQ questions
- Improved user interface

Lee Jun Wei

- Redesigned and redeveloped AASP for reliability and maintainability

Liu Wing Lam

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Problem Statement

- No monitoring features for invigilation
- AASP insufficient to replace or act as alternative to in-person assessments

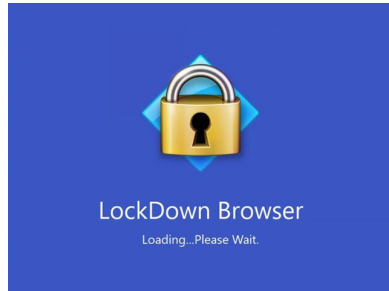
Objective & Scope

- Design and implement test proctoring features
 - To monitor students' assessment session
 - To deter and/or prevent cheating
- Enhance AASP

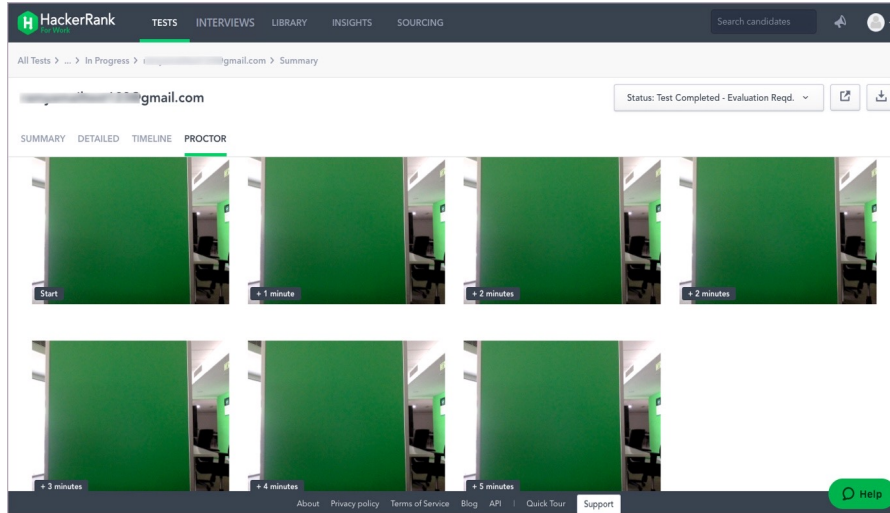
The background features several large, semi-transparent circles in blue and yellow, positioned in the corners of the slide.

02 **Related Works**

Existing Products

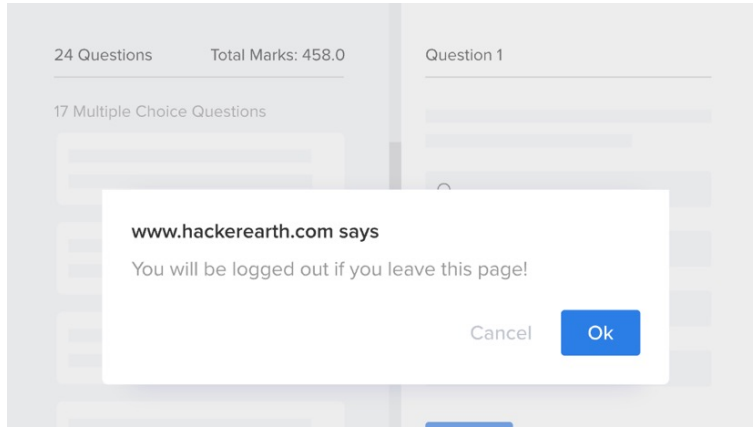


Useful Features



- Test evaluation report showing **candidate snapshots** taken during the test
- Monitors candidate activity through the computer's camera
- Detects the presence of candidate in front of test screen

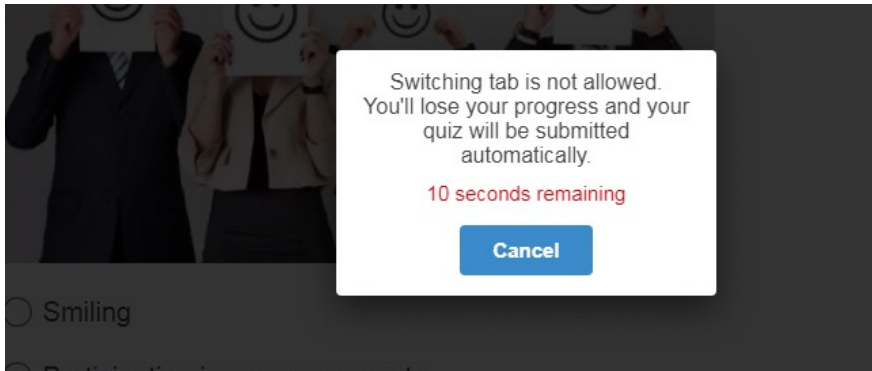
Useful Features



hackerearth

- Warning pop-up when candidate [leaves the test page](#)
- Prevents candidate from referring to external resources on the computer during the test

Useful Features

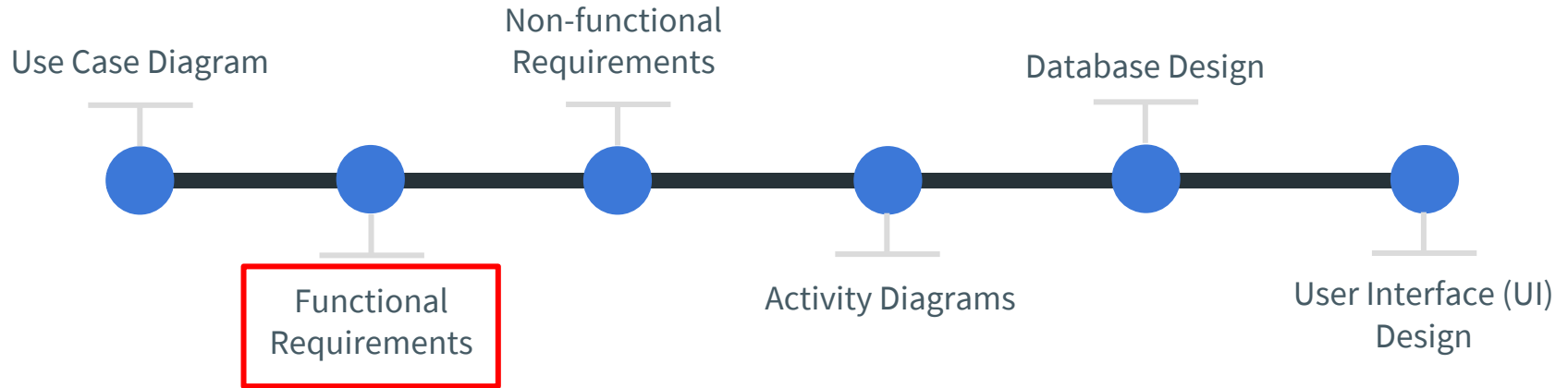


- **Countdown** timer when candidate leaves the test page
- **Test force submission** when countdown ends
- Deters candidate from leaving the test page



03 Design & Methodology

Overview



Summary of Functional Requirements

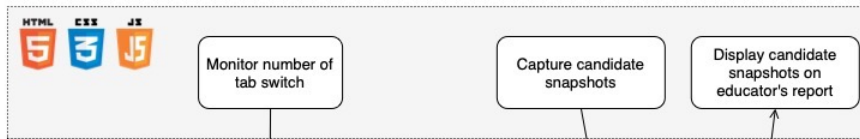
1. Capture **candidate snapshots**
 - Random intervals during the assessment
 - Face detection
2. Monitor candidate **leaving assessment screen**
 - Countdown on 3rd time leaving screen
 - Force submit assessment
3. Disseminate information through automated emails

A decorative background featuring several blue circles of varying sizes in the corners: a medium circle in the top-left, a large circle in the top-right, and two smaller circles in the bottom-left and bottom-right.

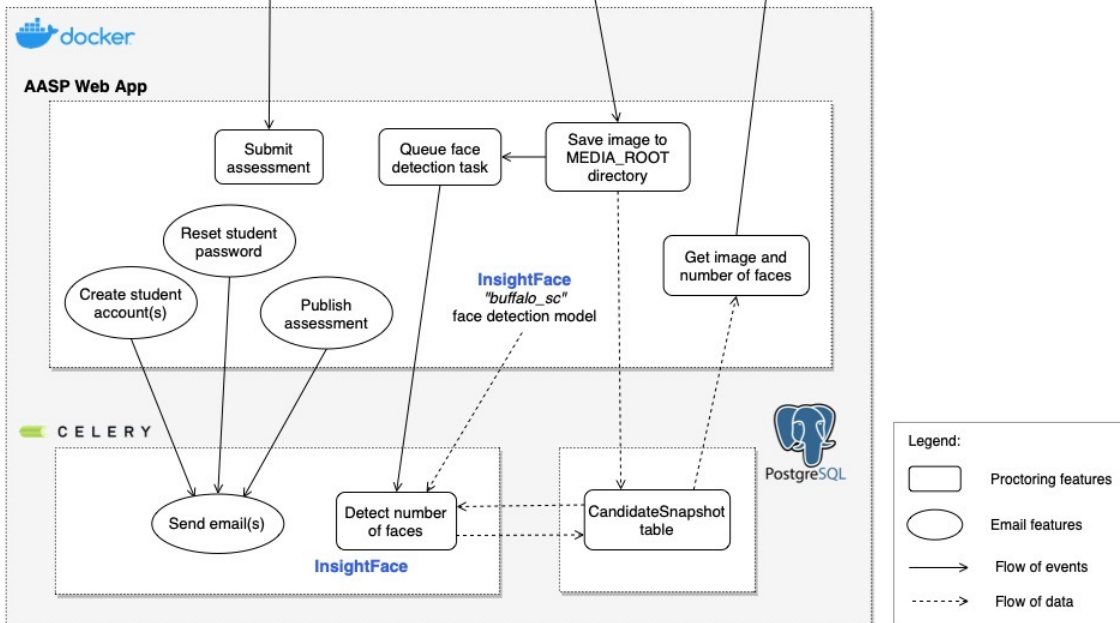
04 Implementation

System Architecture

FRONTEND

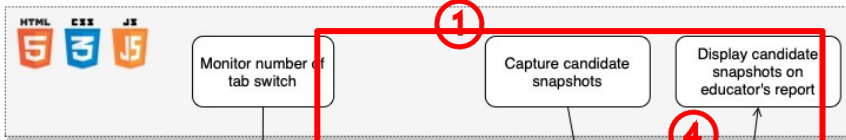


BACKEND

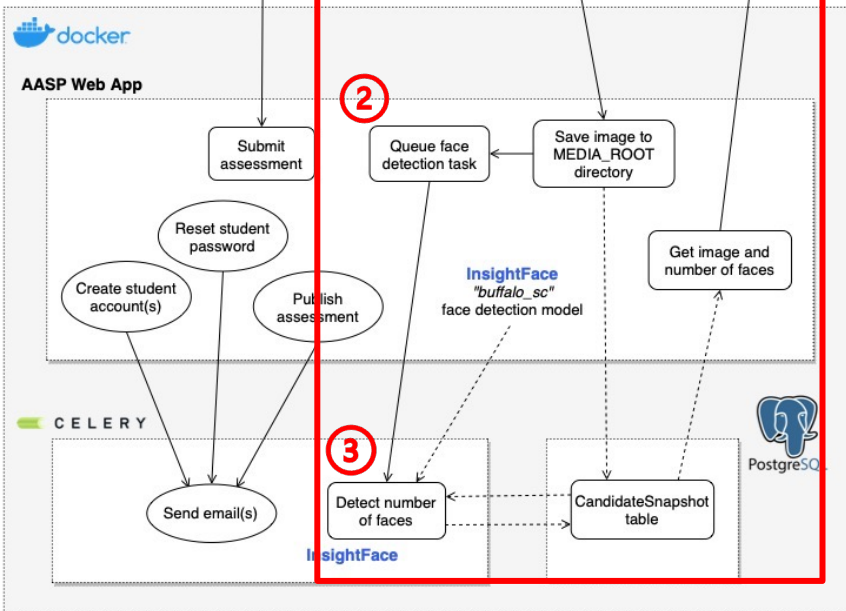


Proctoring Features

FRONTEND



BACKEND

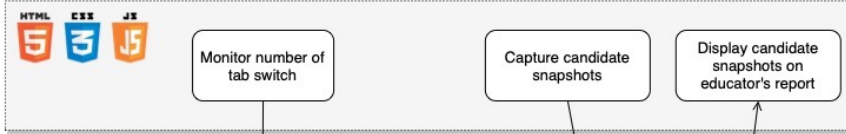


Candidate snapshots

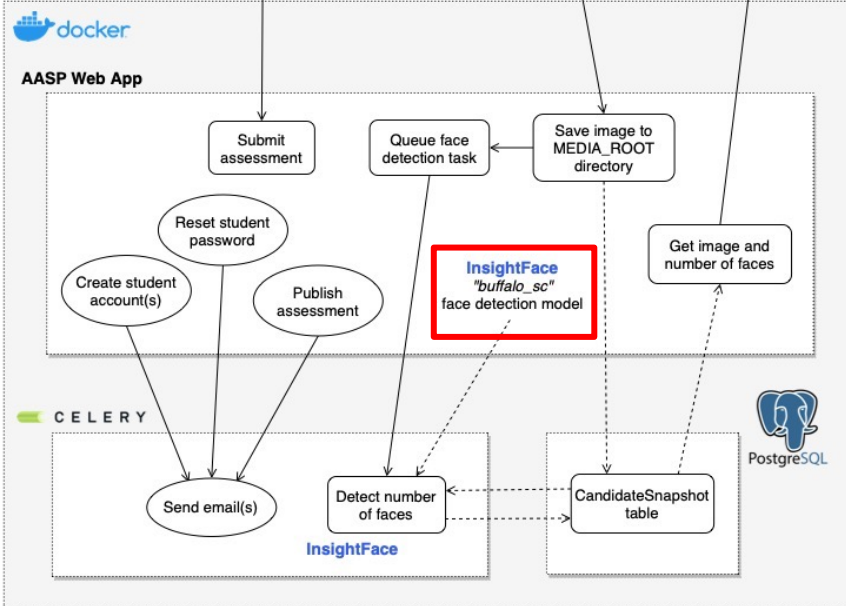
1. During assessment, snapshots taken at randomised intervals
2. Face detection Celery task is queued
3. In the background, face detection is done asynchronously
4. On report page, educator can view candidate snapshots after the assessment has been graded

Proctoring Features

FRONTEND

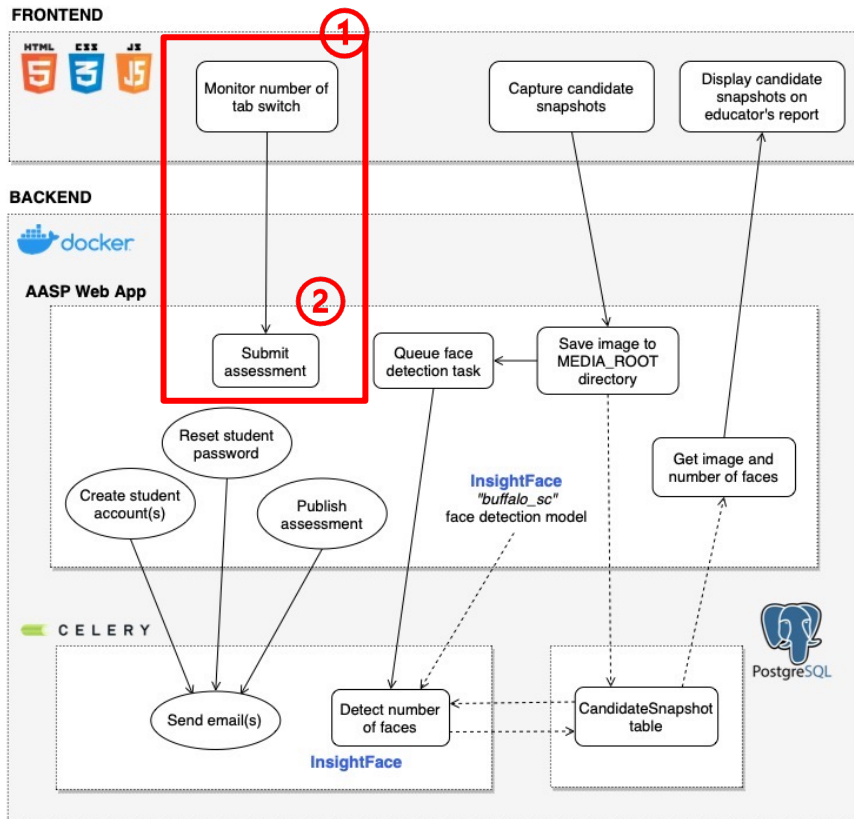


BACKEND



- Face detection model is copied to host machine
- Does not download using internet

Proctoring Features

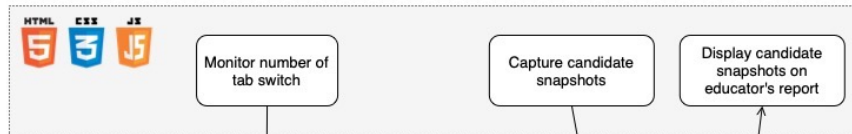


Monitor leaving assessment screen

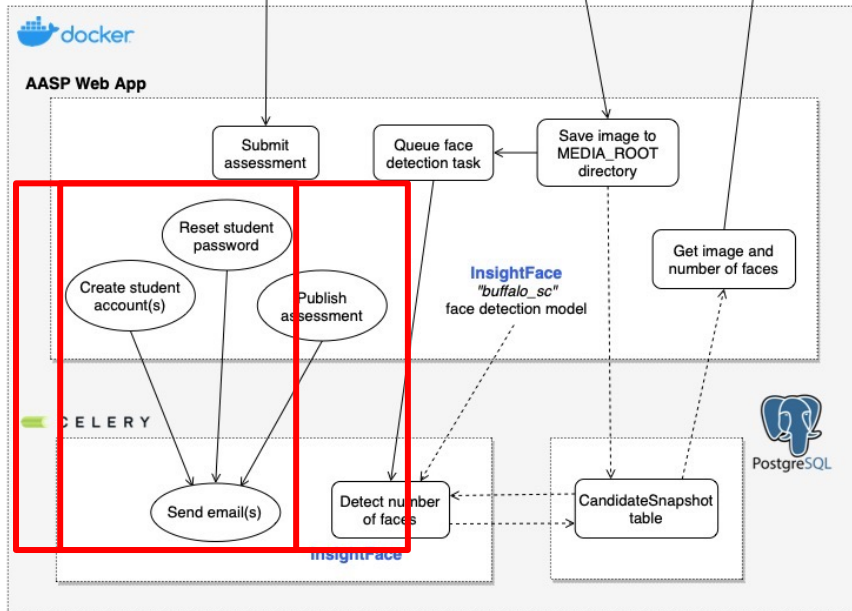
1. During assessment,
 - Warning pop-up appears on 1st and 2nd time candidate leaves
2. On candidate's 3rd time leaving,
 - Countdown timer appears
 - Time randomised between 3 and 10 seconds
 - Assessment will be auto submitted when time is up

Automated Email Features

FRONTEND



BACKEND

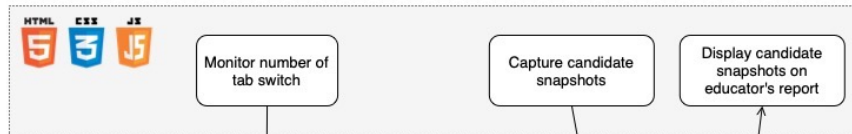


Disseminating Passwords

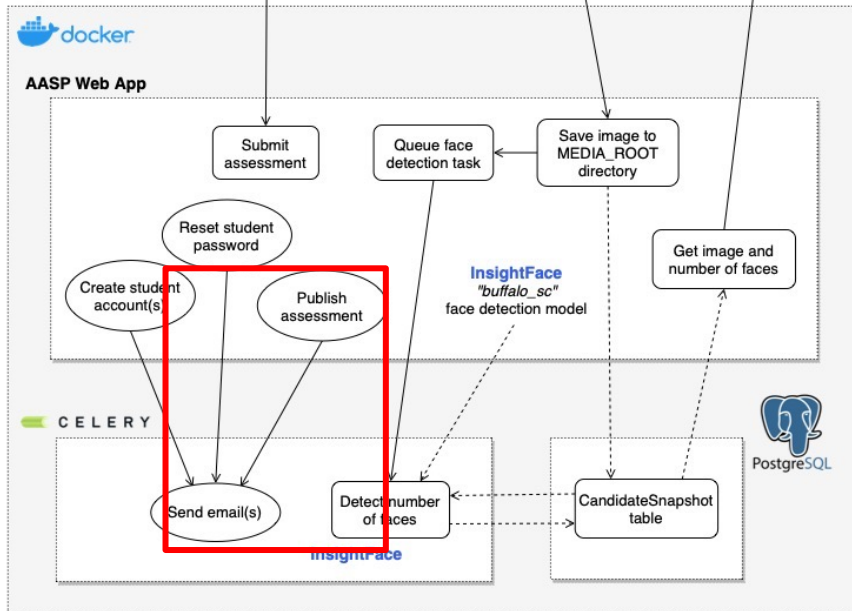
- Student passwords were set to default as *password123*
- Those generated now are cryptographically random and secure
- Emailed to each student
 1. When student account is created
 2. Upon student password reset

Automated Email Features

FRONTEND



BACKEND



Disseminating Information

- Students enrolled in courses are notified when assessment is published

Challenges Faced

Bringing face detection model offline

- Initial model was too large to be saved on GitHub
- Could not download model from InsightFace's downloading provider
- Solution:
 - Contacted InsightFace developer
 - Decided to bring model offline
 - Use a smaller model
 - Copy to host machine via Dockerfile instructions



05 conclusion

Conclusion

Achievements

- Proctoring features
 - To enforce strict and monitored online assessment environment
 - To deter and/or prevent cheating
- Useful automated emails to disseminate information

Future works

- More question types
- Auto save code



06 **Live Demo**

<http://172.21.148.195>



Thank you!

Any Questions?

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