EZ Grader – iOS App for Grading Structured Assignments

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iOS

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What is EZ Grader?

EZ Grader is an iPad/iPhone application that allows instructors to grade structured student assignments.

What is a structured assignment?

Structured content assignments are assignments where each student's assignment consists of the same number of pages, and the questions, question order, question positioning, and space to write/select the answers is identical in the corresponding pages of all students. Most exams and quizzes are structured.

How can EZ Grader help instructors improve the course experience?

Instructors often rely on memory when it comes to tracking how well the students did against specific questions. EZ Grader provides a tabular view of each student's performance against each question, allowing instructors to quickly identify potentially problematic questions. This insight may lead to re-visiting problematic topics in class, grading particular questions on a curve and/or modifying those questions in future assignments, leading to an improved course experience for all.

Do the assignments to be graded need to be in a certain file format?

Yes, EZ Grader expects assignments to be graded to be in PDF format.

How do I import PDF files into EZ Grader?

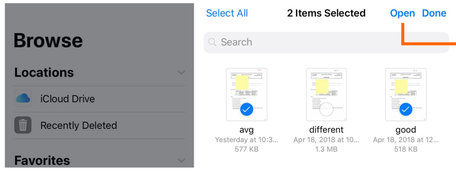
EZ Grader allows the user to select files to be graded from iCloud Drive.

What is the framework that EZ Grader uses to display and manipulated PDFs?

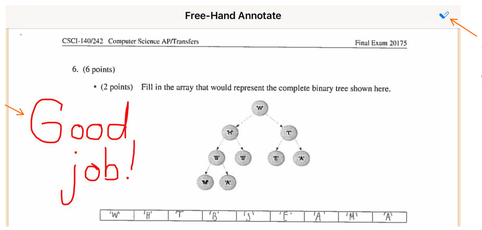
EZ Grader uses PDFKit, released for iOS in WWDC 2017.

Instructor scans in student assignments to be graded as PDF documents and places them in their iCloud Drive

EZ Grader

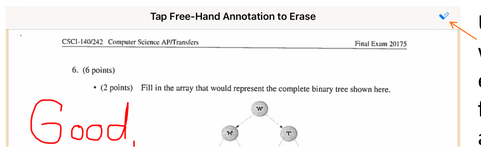


User selects PDF documents to grade from iCloud Drive



User taps when done free-hand annotating

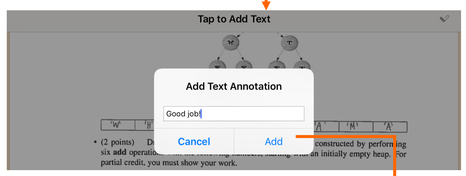
User free-hand annotating



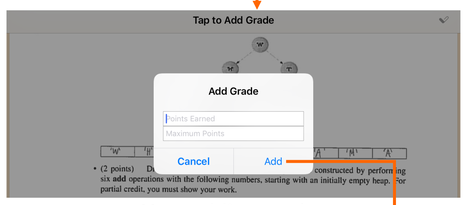
User taps when done erasing free-hand annotations

User erasing free-hand annotations

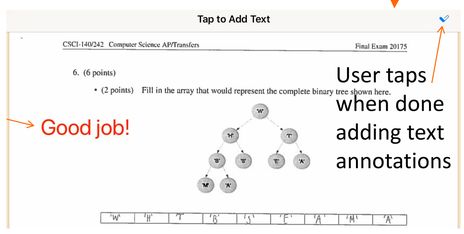
EZ Grader navigation bar



User adding text annotation

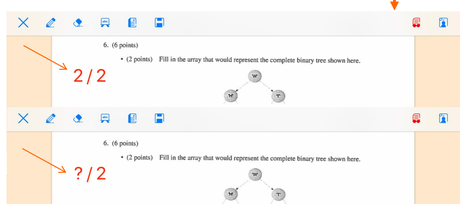


User adding grade

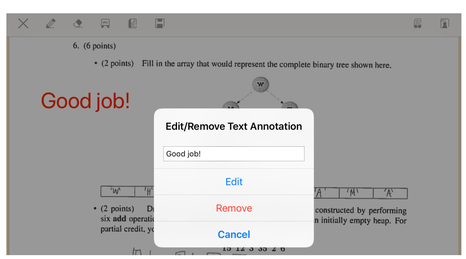


User taps when done adding text annotations

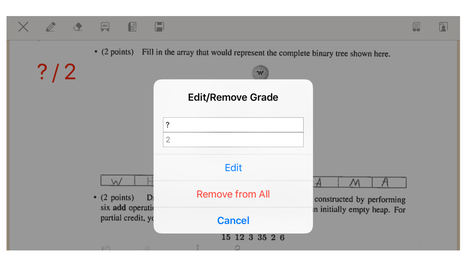
Text annotation added to tapped location



Grade added to tapped location; maximum points portion of the grade is also added for all students



User tapped text annotation to edit/remove it



User tapped grade to edit this grade or remove it from all students

PDFKit

PDFKit provides a PDFView, which holds a PDFDocument, which holds the pages as PDFPage types, to which PDFAnnotation types can be added.

PDFAnnotation types

Ink, free text, circle, highlight, line, many others.

Bezier path

EZ Grader uses ink PDFAnnotation for free-hand annotations. An ink annotation is represented by a Bezier path, which is essentially just a set of coordinates which are connected to form a curve. When user begins to touch the screen a "move" to a point is performed on the Bezier path. As the user's touch moves, a line is drawn from the previous touch location to the current touch location, creating a curve representing the user's screen trace.

Per page view mode (default) - page one of all students is presented first, followed by page two, etc.

Per student view mode – entire assignment of a student is presented, followed by the entire assignment of the next student, etc.

Page Number	Question Number	Max Question Points	Anna	Peter	Mike	Rec
Page 2	Question 1	4	4	3	2	1
	Question 2	5	5	4	3	1
Page 3	Question 1	2	2	1	0	1
Page 4	Question 1	2	2	2	1	1
Page 7	Question 1	4	3	4	2	1
Page 9	Question 1	3	1	2	?	1
Page 13	Question 1	4	?	4	3	1

The combined document is split into its constituent student documents and each document is saved. A CSV file is also created tabulating the entered grades for each student ('?' means the grader did not yet enter a grade)

App navigation bar icons made by Freepik from www.flaticon.com