Web Programming Course Project, 2021/1400, Spring

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Design & Development of Some Components for Web Based Remote Teaching/Conferencing System

The goal of this course project is to design and implement following innovative HTML5/JS components and a simple integration of them toward building a a pure HTML5 remote teaching/conferencing system:

I) **Smart sharable white board**: This white board should be implemented using a HTML canvas and every words/shapes/strokes which user writes on it must be listened and send as vector data (e.g line segments/polygons) toward a web backend where those data are shared to all the clients which have connected to the same session. The black board has some useful/smart features in addition to broadcasting what is stroked on it:

a. It can save the sequence of line segments in a vector format file.
b. It can fast play the whole text/strokes which the teacher/presenter has stroked on it in say 20 minutes in a given short time (e.g 30 seconds). This helps a student/listener to see the order/flow of writing the text/formula/shapes in a few seconds and same much time.
c. It has drawing tools/widgets set which allow user to draw formal circles/lines/rectangles/typed text to the user. (This is in addition to free hand shapes that the user can draw on the white board.)
d. User can load a Photo/PDF/ as background image of the white board and the draw other things on that background.

II) **List of Attendees:** a box which shows a list of all users which have entered the meeting. And allows some operations:

a. Export a list of all users that have attended during the meeting with their presence time interval/duration.
b. Add some permissions/roles to each of attended users to enable some features in the meeting for them (i.e., listener, allowed to speak, presenter, host)

III) **Chat box:** This is a simple chat box which allows all users that have connected to the meeting to send/recive chat messages. Following options must be considered:

a. Clearing the current chat messages
b. Exporting the full list of chat messages
c. When a user/student answers a question in chat, the teacher can accept/reject or give a 0-100 score to that answer. Also teacher can assign a level of hardness to the question that the answer is for that.

IV) **Sharing microphone (audio streaming)**: This must be provided using WebRTC technology.

V) **Sharing desktop (low frame rate video streaming)**: This This must be provided using WebRTC technology for streaming the video captured from desktop and the Web Desktop Sharing API to capture image/video frames from the user desktop.