6.111 Project Abstract: Dance Dance Revolution

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Our goal is to recreate the popular game Dance Dance Revolution[1] (DDR). A game is comprised of a given song that has predetermined "choreography" shown by timed arrows on the display[2]. In the original arcade version of the game, a player stands on a four direction pad and must step on the arrow (or combination of arrows) at the times indicated by a display in order to gain points.

We are planning to use a combination of both cameras and sensors to project and recreate the game on the floor. Once the user has selected a song from a catalog, the song will play and the choreography that indicates where the player must step will be displayed via VGA on the monitor. The player's steps will be tracked and scored appropriately.

The FPGA will be the central control system of our final project and will have 3 main tasks: VGA display (dance module), music playback (sound module), and keeping track of the score based on the sensor input (score FSM module). The song and dance video will both live in external memory that the FPGA will then be able to read from to display the dance instructions and play back the song.

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[1] More on Dance Dance Revolution https://en.wikipedia.org/wiki/Dance_Dance_Revolution#Gameplay
[2] Example gameplay display https://www.youtube.com/watch?v=sv7gxqEhcBo