Motivation

- Save money for music board
- Easy to use
- Portability

ARMusic

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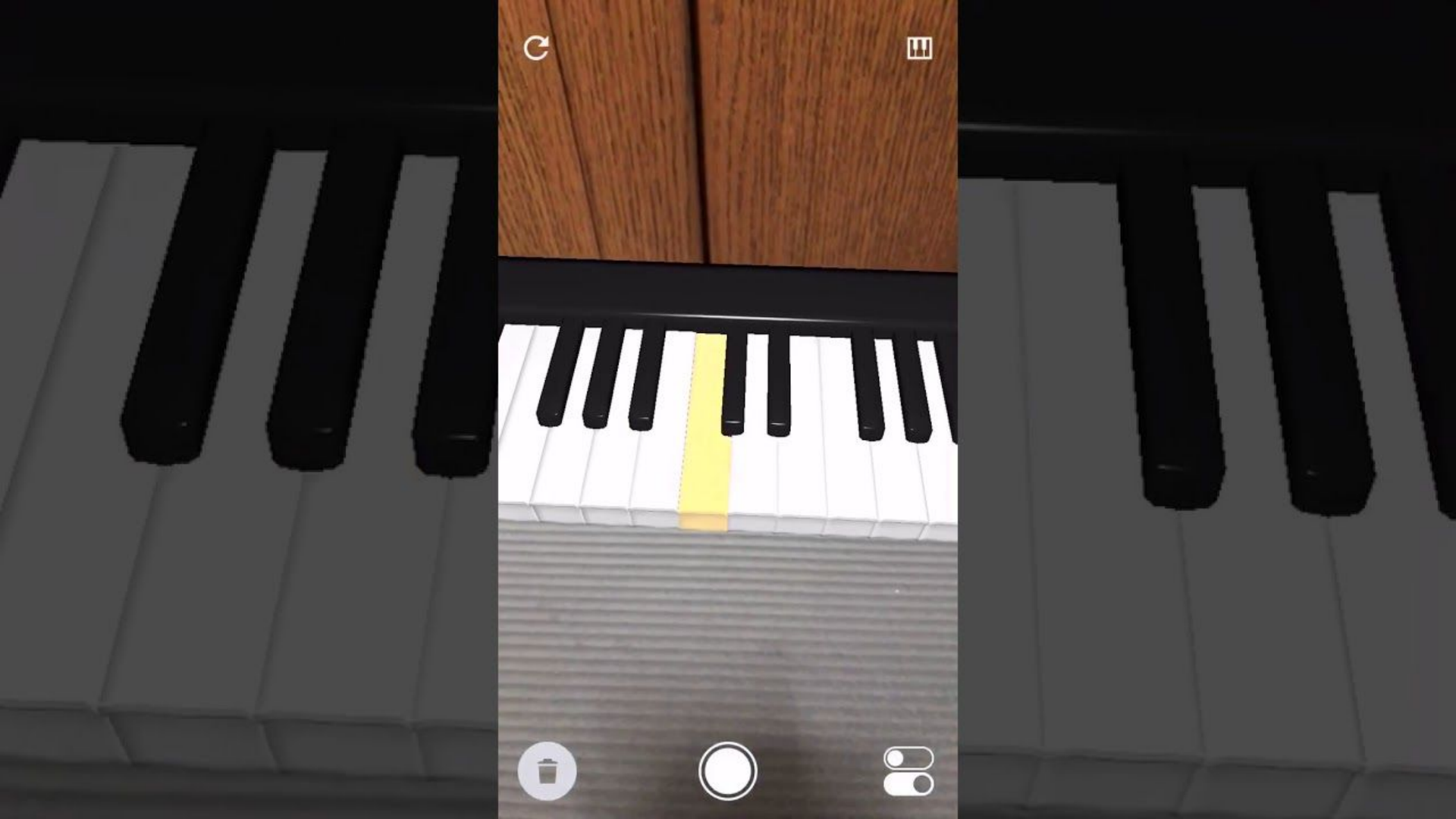
What it will be like

- Computer program that displays AR effects on the table
- Several large buttons that would play sound or rhythm accordingly
- Capturing hand gestures and interpreting and playing the sound



Potential problems

- AR motion adapts with camera movements
- Detection of hands and table
- Noise filtering

Requirements

- System should display AR effects to plain tables only not messy ones(
- Detection of the table and placement of AR effects
- Hand detection (detecting a hand on a button with latency shorter than 0.5s)
- Noise filtering for hand detection which filters out fast hand movement
- Music is smooth

Solution: AR

- Interest point detection and matching
- RANSAC
- Geometrical model

Solution: Hand detection

- Computer Vision
  - Template matching
  - Skeletonization
  - Dynamic tracking
- openCV
  - Haar classifier
  - OUHANDS databse

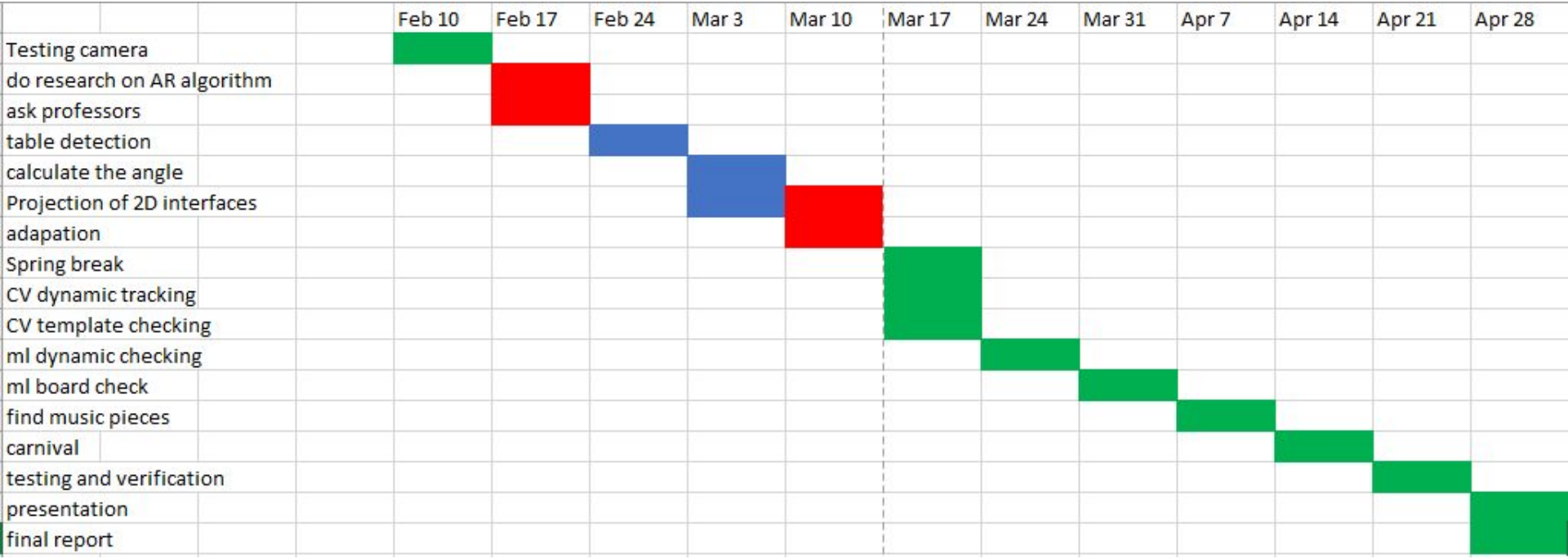
Testing metrics

- Be able to display 3D effects
- Measure the response time for the system to detect the hand that is on the button
- Hand surpassing button but not touching, it should be filtered out
- User feedback collections

Tasks

- AR (projecting, adapting angle, interaction) -- Mingquan & Tianhan
- Table detection (detect, find out angle) -- Xinyu
- Hand detection(cv dynamic tracking/ find pic frame by frame & template-checking/ ML) -- All
- Testing and verifying --All

schedules


Feb 10
Feb 17
Feb 24
Mar 3
Mar 10
Mar 17
Mar 24
Mar 31
Apr 7
Apr 14
Apr 21
Apr 28
Testing camera
do research on AR algorithm
ask professors
table detection
calculate the angle
Projection of 2D interfaces
adapation
Spring break
CV dynamic tracking
CV template checking
ml dynamic checking
ml board check
find music pieces
carnival
testing and verification
presentation
final report

Q & A