

SonicSurface

Touch-Enabled Interactive Mirrors Using Sound-Based Localization

Team Brogrammers

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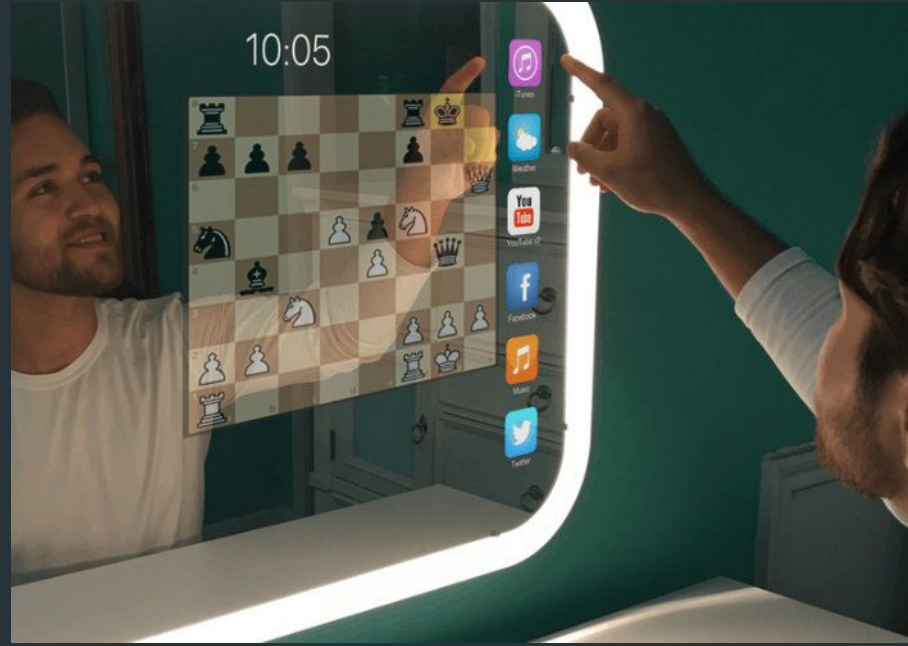
Convenience



Multitasking



Fun



Problem Definition

Existing interactive smart mirrors require **expensive** touch surfaces

Use **microphones** as an alternative hardware option

Setup

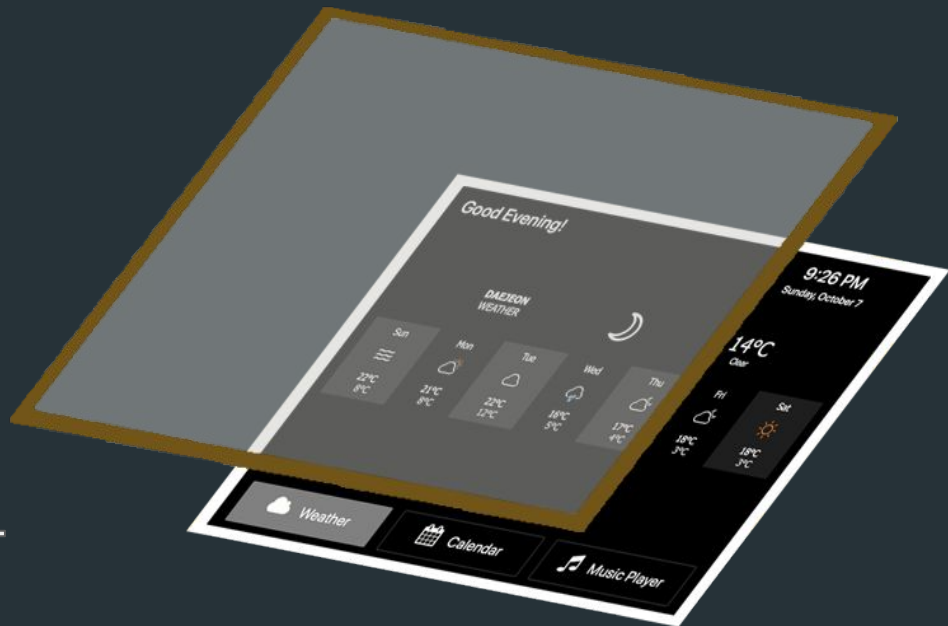
App Screen —



Setup

Glass _____

App Screen _____

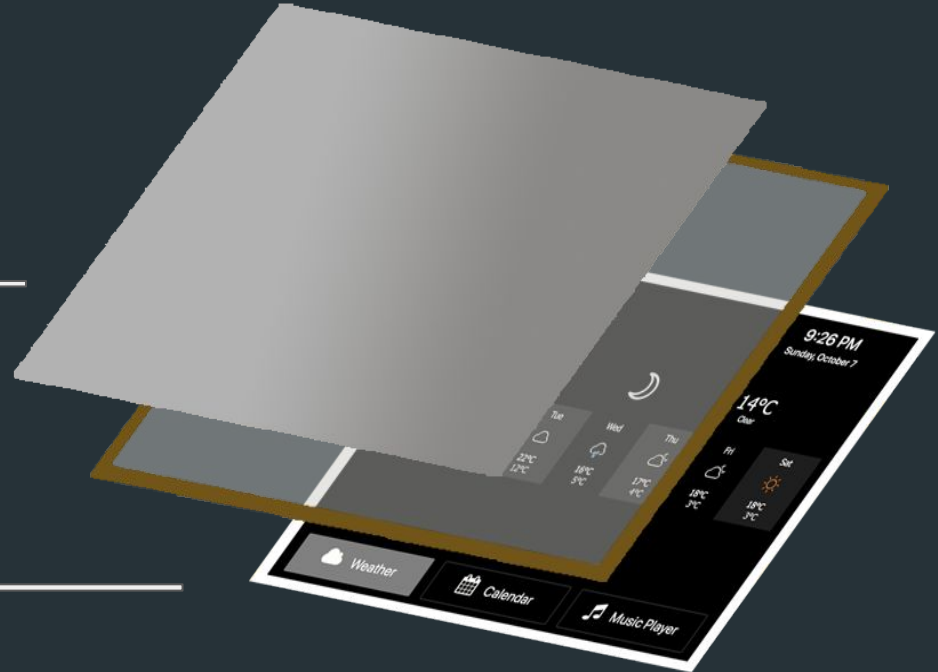


Setup

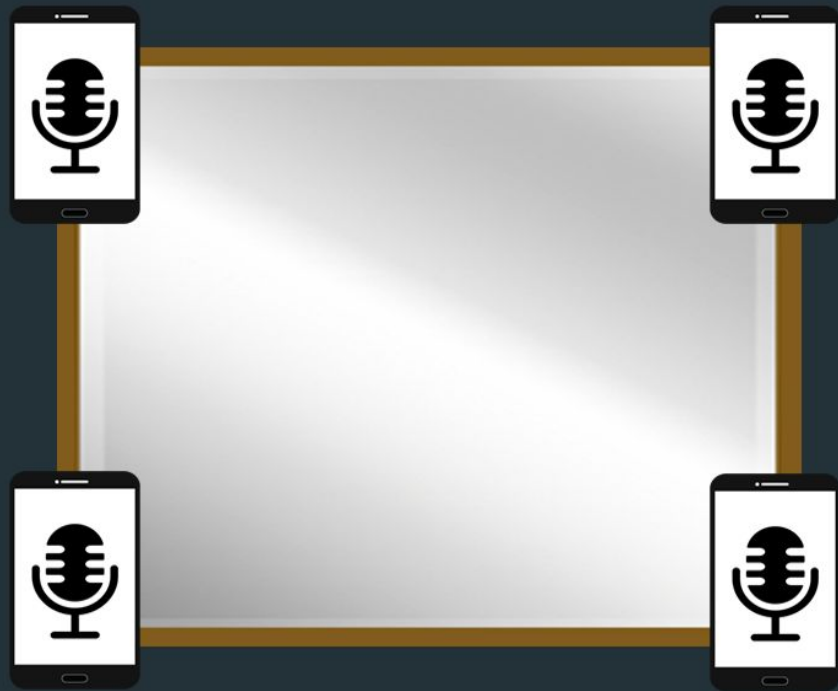
2-Way Mirror Coating—

Glass —————

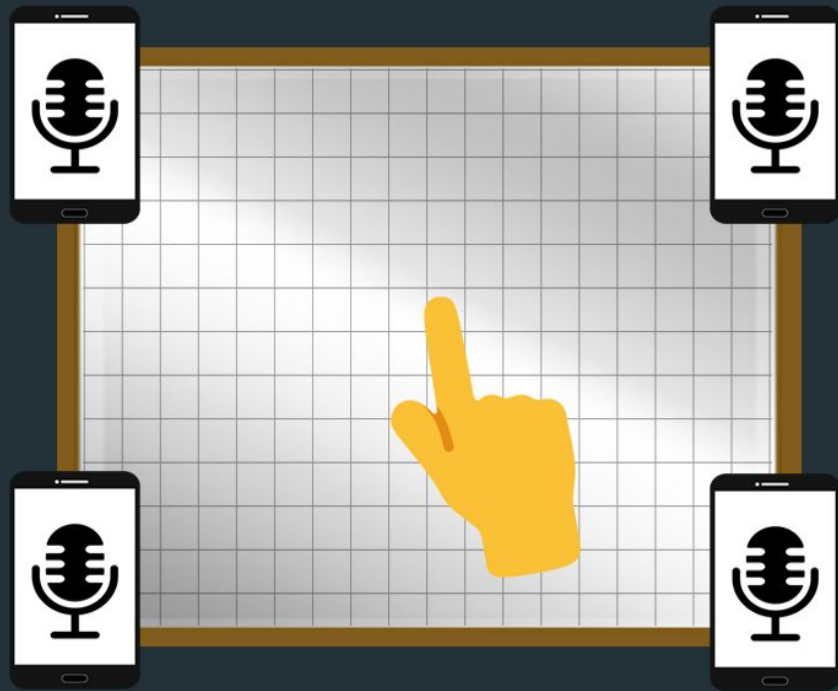
App Screen —————



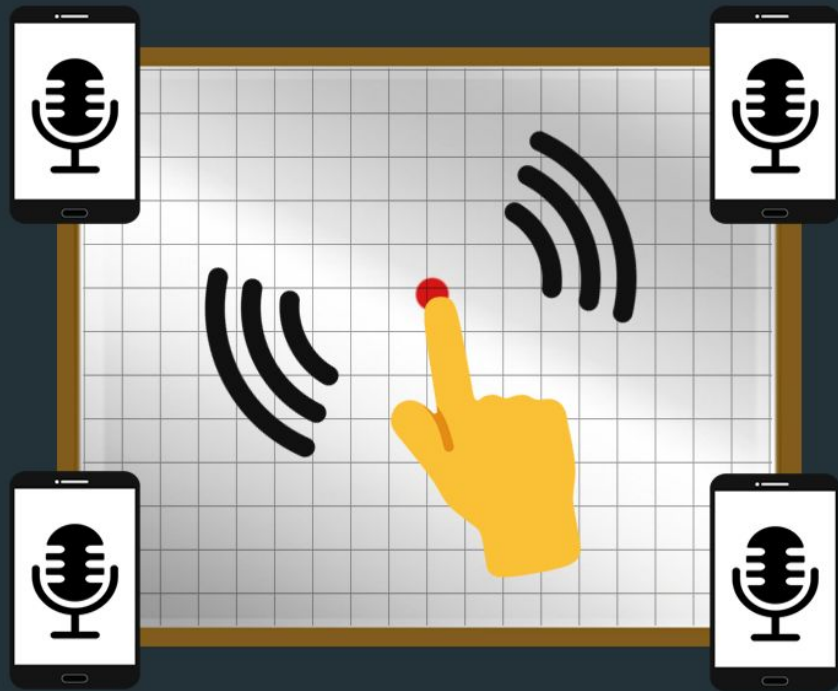
System



System



System

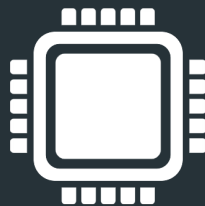


Sound Receiving Server



- Gets sound signals from microphones
- Sends to processing if receives sound from all 4 mics

Sound Localization Processor



- Maps 4 sound snippets onto (x, y) mirror coordinates



(x, y)
screen
coordinates

Implementation Demo



Limitations

Sounds louder than a given **threshold** are registered as taps

Trade-off between omitting taps and registering noise

Solution

Add **vibration sensor** as a better classifier of sounds into taps and external noise

Magnitude of vibrations caused by external noise is **much lower** than that caused by taps

Plan

- Apply in more **use cases**
- **Test** on a bigger screen
- Make use of **vibration** detection
- Test the system with actual **users**

SonicSurface

Breathing Life into Mirrors
through Sound . . .
