# Visualize the Invisible

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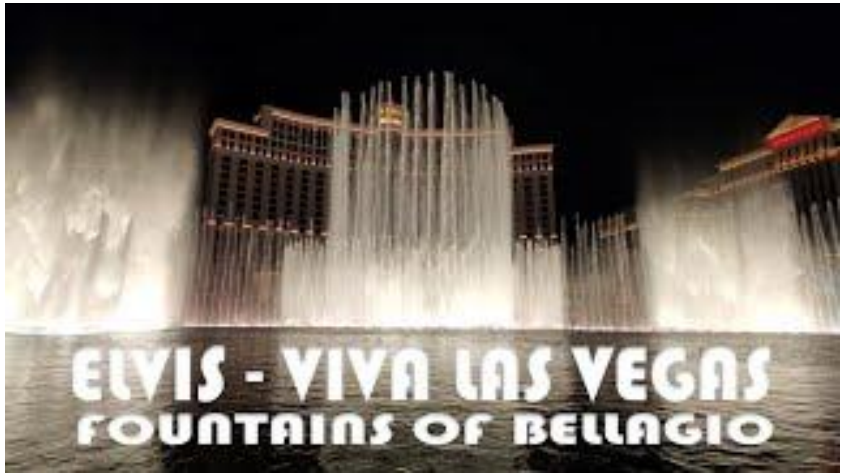
# Mission Statement

The Bellagio’s mini-me: a dance of water fountains to the beat of any chosen musical piece and is highlighted by a spectrum of LEDs. The height of the water and the intensity or color of the LEDs is determined by the frequency/pitch of the music. Visualize the Invisible.

# Bellagio Hotel

- Professor’s addition (thank you!)
- Choreographed patterns are pre-programmed for select songs only
- Only happens at certain times
- Not portable/personable AT ALL




# Water Speakers

- No unique patterns
  - Each pump shoots water to a set height
    - Based on music intensity
- Like the Bellagio, not really customizable
  - Colors, yes
  - Height, no

# Our Solution

- An indoor water show!
  - Maybe even a semi-portable one
- No pre-set patterns at set times
  - Real-time calculations based on analysis of music played
  - Use results of calculations to create a graphical representation
    - Multiple pumps with height determined by music frequency at that second
- No set music
  - Entirely chosen by user

# Components

- Pump Control
  - 8 pumps minimum to show a detailed pattern
    - 15 pumps would be ideal (or more…)
      - More = better visualization
  - Pump controller PCB
- LED control
  - Must be waterproof
    - For obvious reasons
  - Small ring LED for each pump
    - Allows emphasis on water column
  - LED strips to line entire container
    - Cheaper option…

$9.99/4 pumps + tubes

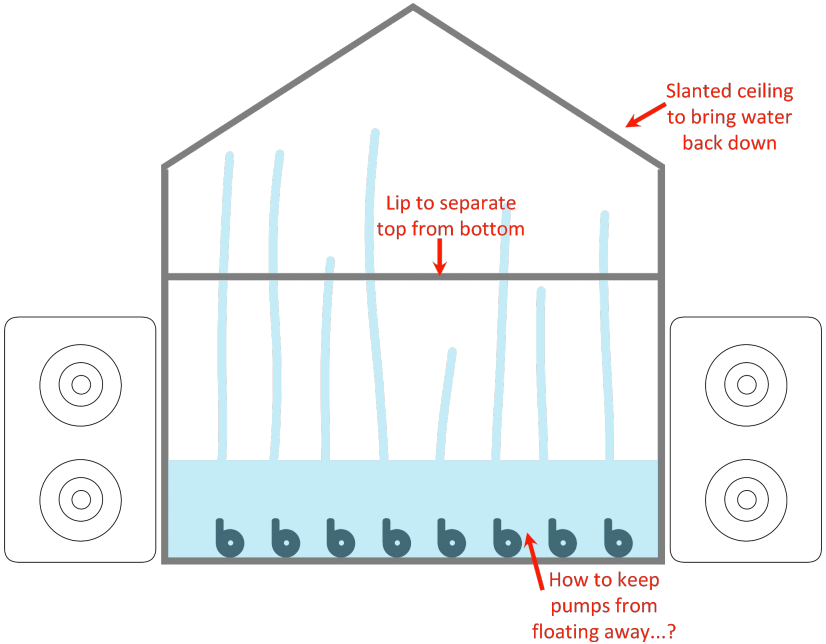
# Components

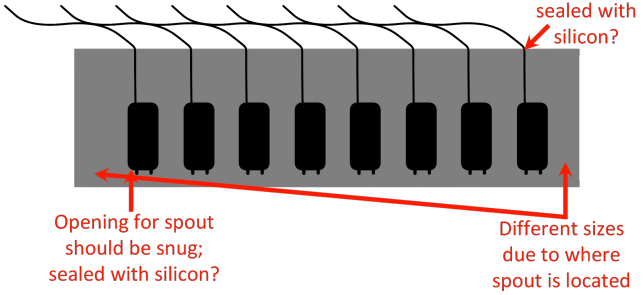
- Speakers
  - 1 left + 1 right
  - Quality… best we can find
- Software (language TBD)
  - FFTs
    - Fast Fourier Transform
    - Analyze music input
    - Split input into multiple sections of frequency data
  - Compute pump flow rate/power from data
    - Allows emphasis on water column
  - Beat Sync function for LEDs
    - Stretch goal…?

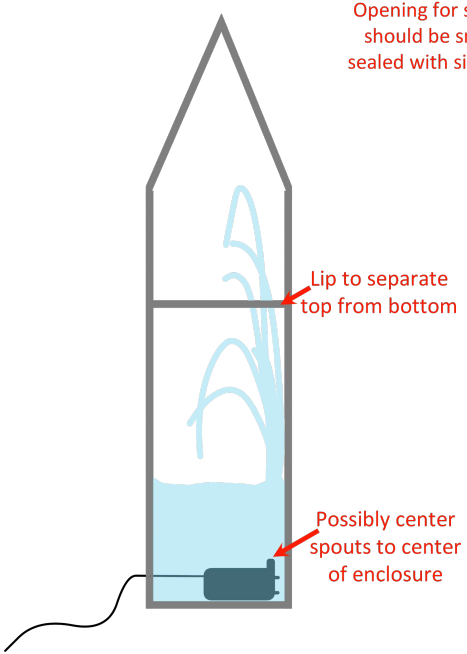
# Components

- AUX input
  - Gotta get the music from somewhere
- Container
  - Acrylic encapsulation to hold water, LEDs, and pumps
  - Speakers attached on the sides
  - Separate encapsulation to keep the circuits, PCBs, and microcontroller away from water
    - For obvious reasons
      - 💀 BZZZRRRRT 💀

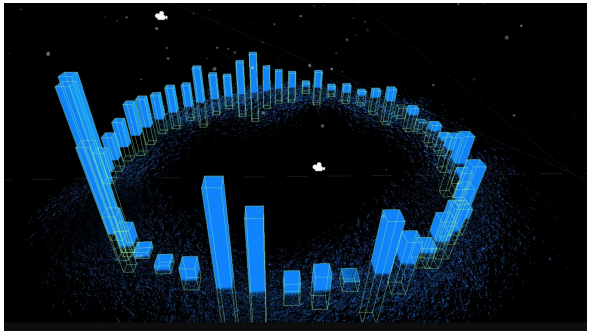
# Sketch 1 - The House

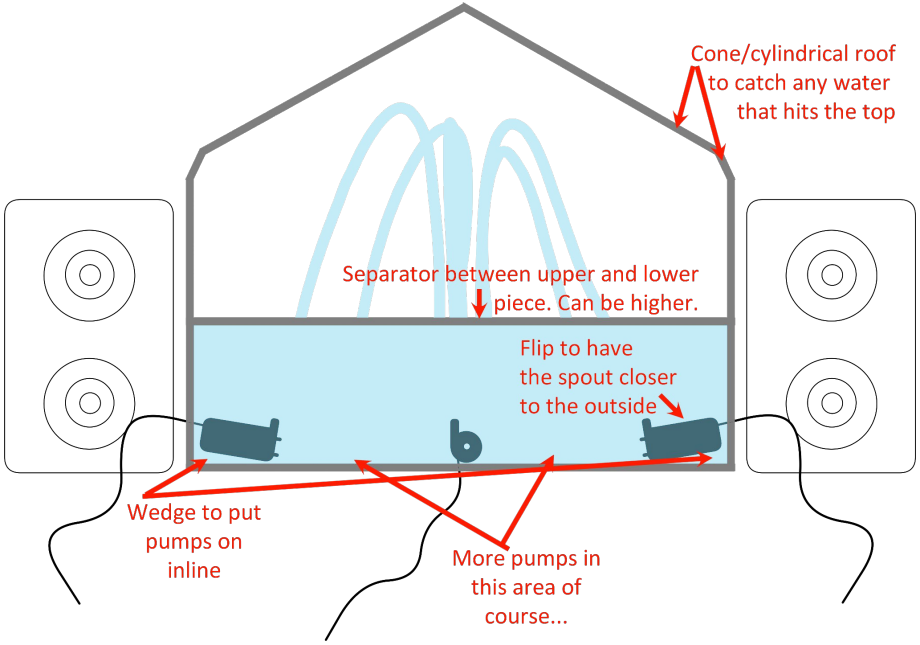


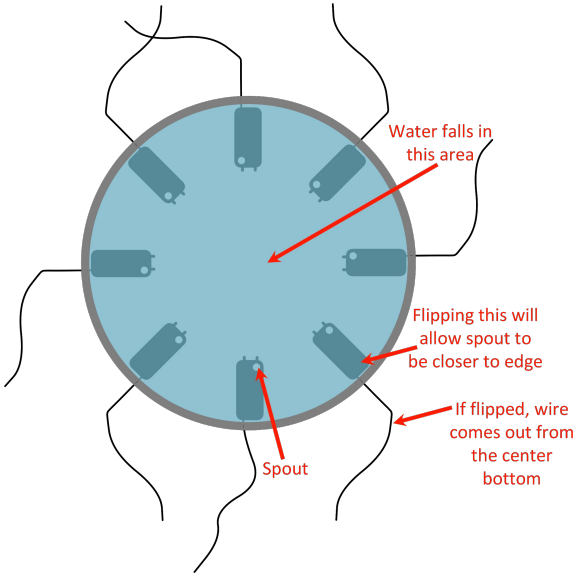



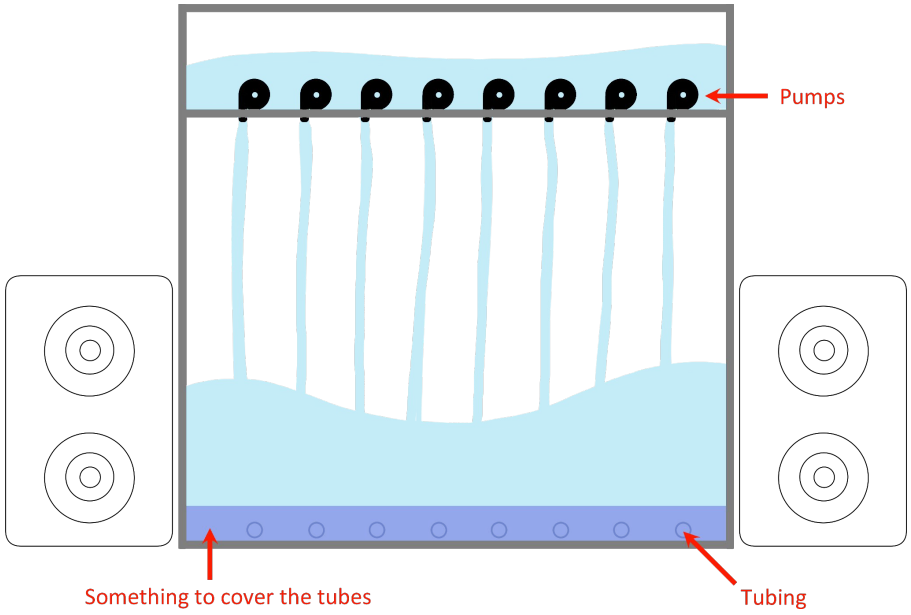

# Sketch 2 - Circus Tent

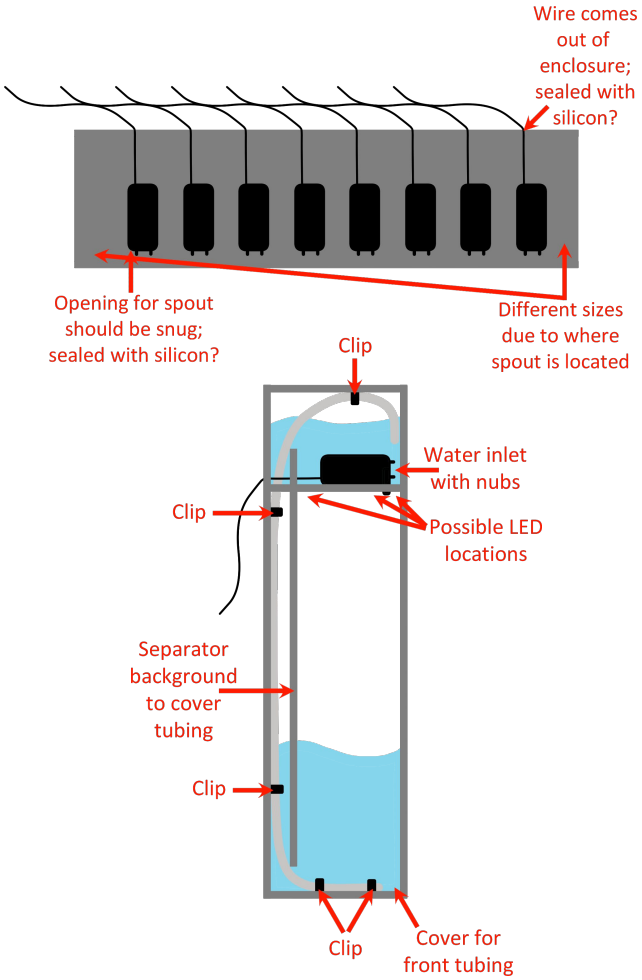




# Sketch 3 - Water Curtain



# Stretch Goals

- User Interface
  - LCD screen
    - With touch screen?
  - Buttons to control LED presets
    - Beat sync
      - LEDs change with every beat
    - Rainbow
    - Solid color
  - Buttons to change song
- AUX → Bluetooth

# Any Questions?