iSynth

The Quest for a "Better" Music Synthesizer

Part VII :
Final Demo

Actors

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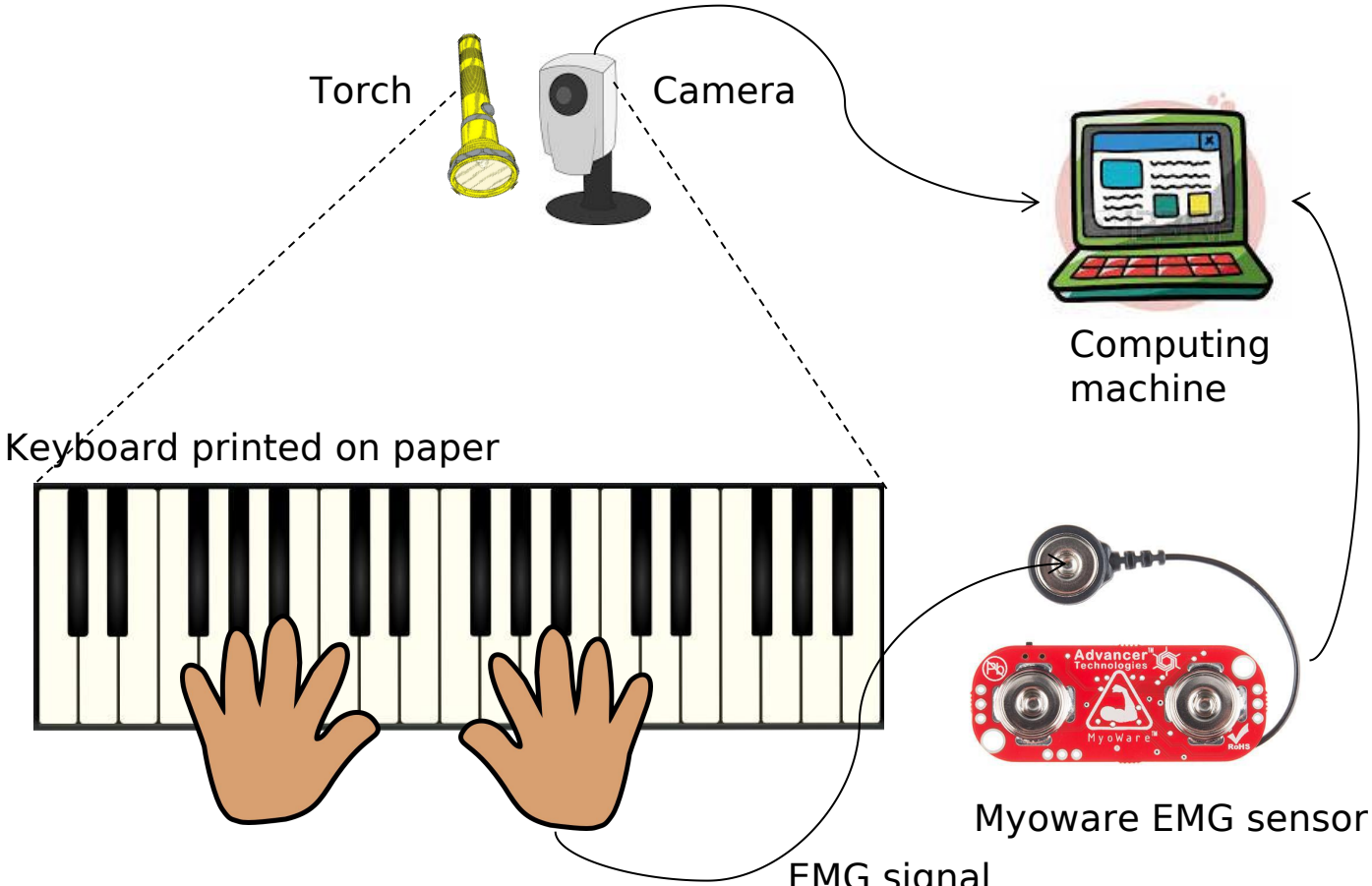
Our Inspiration

The music synthesizer

Q: Something more portable & modular ?



Sub-goals of the objective

- Detect which key was pressed on the printed keyboard by processing the video from the camera input.
- Indirectly determine the velocity with which a key has been pressed by sampling the Myoware muscle sensor's EMG signal.
- Modulate the intensity of sound based on the velocity of a keypress.
- Assumptions :
    - Only single-key presses shall be supported.
    - Speed of response shall not be addressed for now.

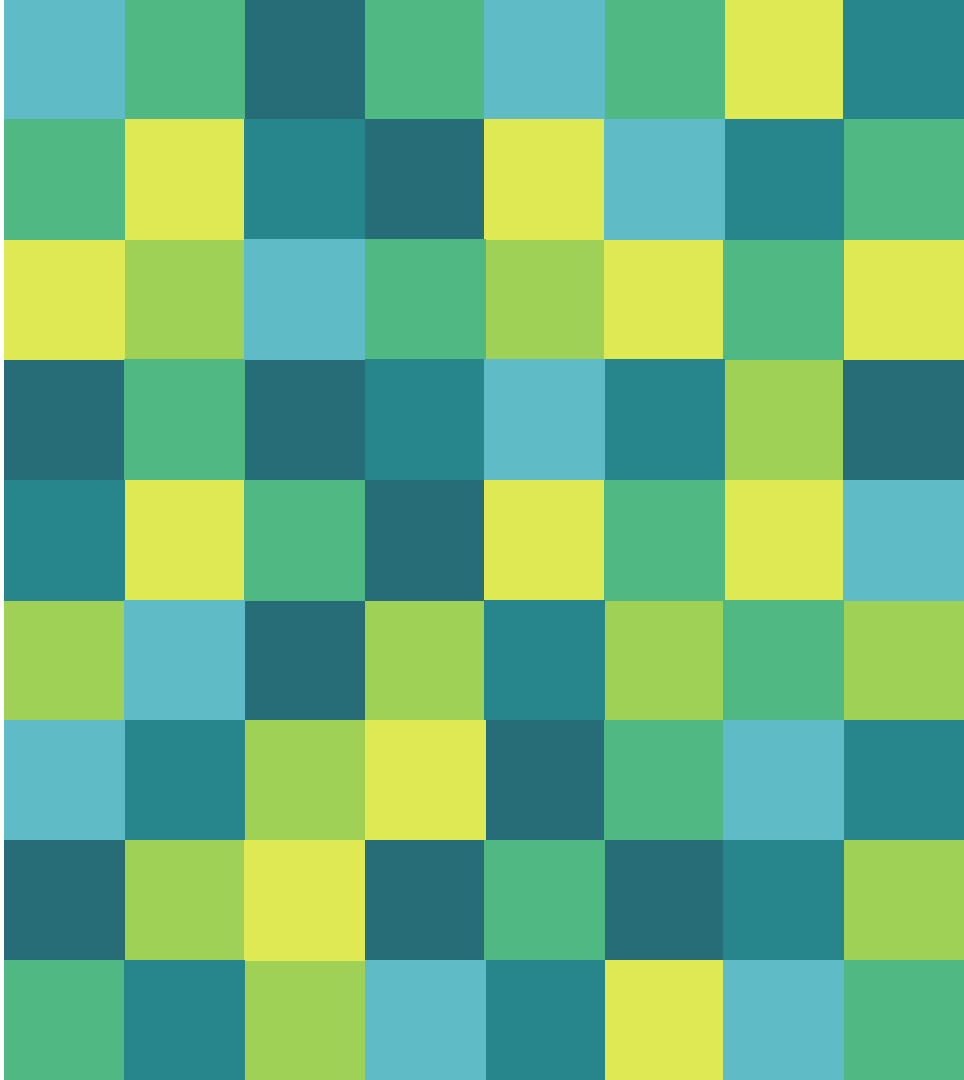
What we did...

- Computer vision part :
  - Was a key pressed ? : Use a shadow analysis algorithm to detect whether a key was pressed / not.
  - Which key was pressed ? : Used a simple spatial coordinate mapping technique to detect the same.
- Key velocity & sound generation :
  - Interfaced an EMG sensor with a microcontroller, synchronized the digital readings with a laptop's keyboard input to generate sound at the actuated velocity.

Challenges faced

- Computer vision part :
    - Shadow analysis technique of determining whether a key was pressed / not is very sensitive to lighting conditions.
    - The current implementation consumes time & there is significant lag in the response of the system to video stimulus
- Key velocity & sound generation :
    - EMG sensor input is sometimes noisy and unpredictable.
    - The electrode's adhesive erodes over time and this also affects the EMG signal input

Demo



Thanks!

Any questions?

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