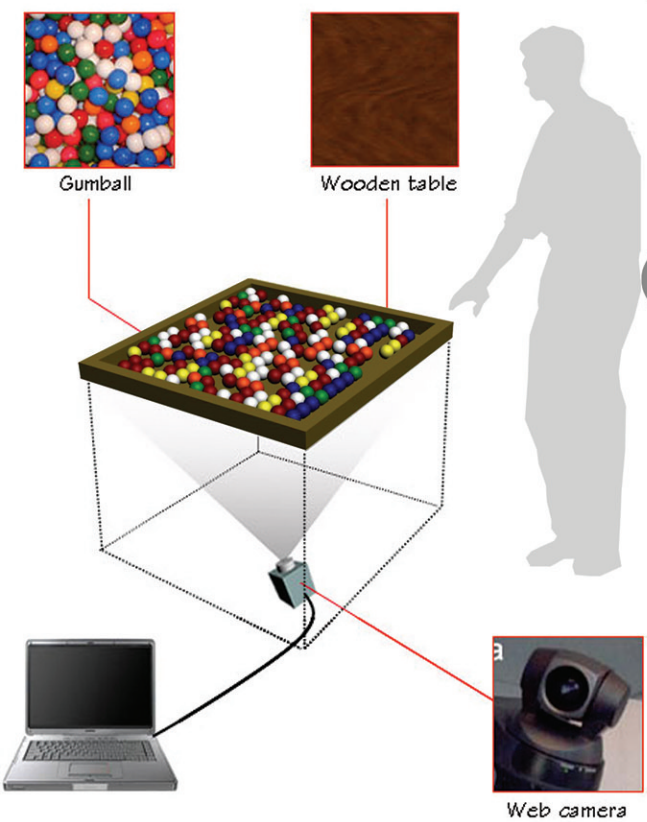
Bubblegum Sequencer

Problem statement

Step sequencers are a popular tool to create and edit music, particularly drumloops. Implemented in software, a step sequencer consists of a grid, usually with 16 columns, each representing a sixteenth note in a bar of music. Each row in the grid is assigned a sound sample, and samples are placed in time by selecting the corresponding cell on the grid. This mapping is abstract and arbitrary, and does not capture the performative quality appropriate to the contexts where drumloops are used, for example in dance clubs.

Proposed solution

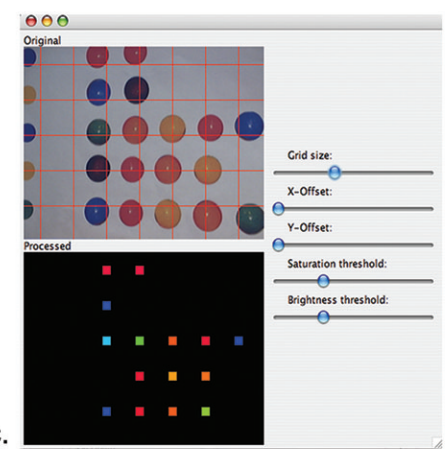
We aim to make step sequencers more physical by using tangible objects to represent samples. Our project builds on the work of Durrell Bishop's Marble Answering Machine and Patten, Recht, and Ishii's AudioPad by mapping musical samples to colored gumballs, which can be set into holes arranged in a grid on a tabletop.



Technical implementation

The prototype is built on a table with two levels. We drilled 96 holes into the top surface, and placed a Logitech web-camera on the bottom surface, aimed to capture the colors of the gumballs arranged on the grid.

Software written in Java and making use of the ImageJ image processing libraries processes each frame of video, selecting the average hue at each intersection in the grid shown above left. These average hues are then quantized into a two-dimensional array which is in turn passed to the MIDI controller to generate music.



Using the prototype

Since the frames of video are processed in real time, using the prototype is as simple as starting the system and arranging gumballs on the grid. Each gumball's color is mapped to a specific sample such that, for example, the user places a red gumball for every kick drum, a green for every snare, etc. Time is read by the sixteenth note from left to right as in the software examples, and rows are not mapped to anything.

Mapping samples to tangible objects in this way is more natural than an arbitrary software mapping, and frees the performer to dance and interact with his or her audience while performing.