Design of a Foosbot

TJHSST Computer Systems Lab

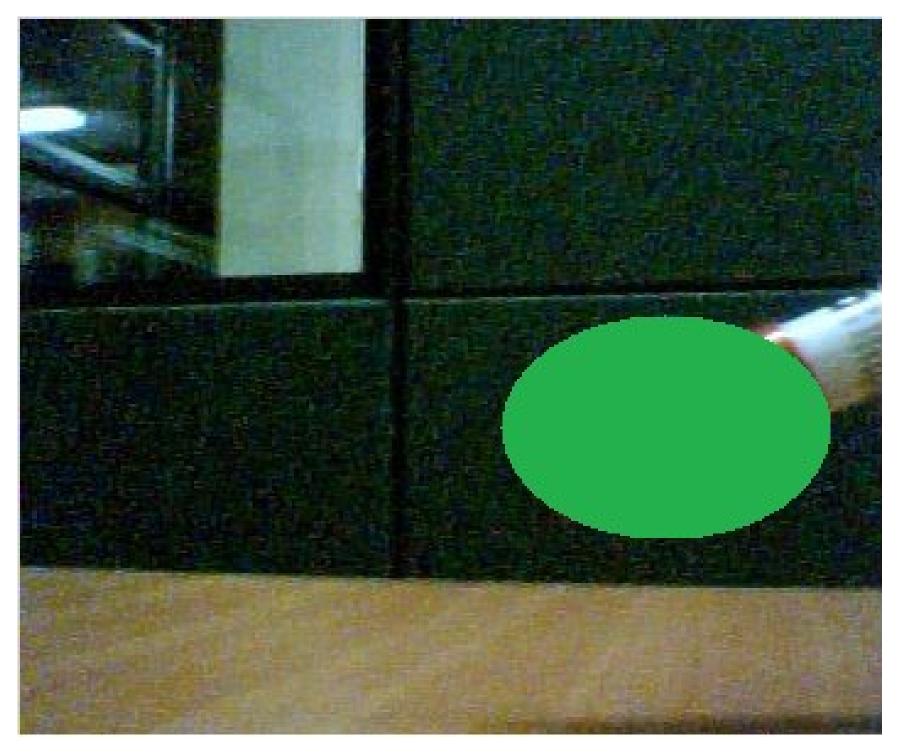## 2008-2009

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Abstract: The purpose of the project is to create a functional AI to be physically integrated with a full sized foosball table. The emphasis was on the ball tracking aspect. The color differentiation and tracking aspect was physically completed. While the others were not, due to funding and time issues. Despite this the project can be viewed as a stand alone when only the tracking is considered.

Using a Microsoft Life Cam, the ability to track colored objects in real time was achieved.
Color differentiation in the pixels was used to track specific colors as they moved about the screen.

The real issue became using the data gained from tracking to predict paths.

Motion tracking was done using the processing language, a similar effect can be achieved via a mat lab program.

The path prediction concept relied upon a creation of a map using coordinates obtained at specified time delays to create vectors. These vectors then had a reel location associated with them. These reel locations would then feed into a micro controller that would control pneumatic controls created by the other tech lab.

The prediction AI was evolutionary and used prior path data to predict next locations in real time. It did not so much think, as it did memorize, which allowed it to react faster.

Even with faster reaction speeds, delay caused by using lower end hardware (web cam and slow processor) was unavoidable.

While no foosbot was physically created because of the expense of pneumatic parts, the tracking and path prediction aspects were created independently of the physical design.

Little too no progress was made with the shot generating rotating offensive algorithm, and all explorations in that area were almost entirely theoretical.

Limitation of the design still include the resolution of the camera, and the lag time while tracking.

The largest area of success was generated in the aspects dealing with color and motion tracking that would be used to monitor the path of the ball in the play area.