You're Out! An Electronic Baseball Umpire

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Umpires in the MLB have only an 84% call accuracy which requires an average of 2:30 minutes of video review each game. An electronic baseball umpire was first created using a minimum of three microphones, placed around a base. Sound triangulation was used to calculate the sounds from both the ball hitting the glove and the runner hitting the base. A novel program was created using Matlab to solve Euclidean mathematics needed to accurately identify the location and timing of both ball and runner. A number of experiments were performed to determine optimal techniques for data entry, ultimately evolving into a fully automatic system tested with humans on a baseball field. A program written in Objective-C using Xcode was then created to take in sounds automatically and decipher them before figuring out where each noise originated. The pythagorean theorem principles were used for determining the location of the noise. The program has a 100% call accuracy and can identify noises that are just 2.3 x 10-6 seconds apart, ensuring that even the closest of calls will be easily made.

Awards Won:
Fourth Award of $500
University of Toronto, Faculty of Applied Science &amp
Engineering : First Award - Da Vinci Engineering Enrichment Program (DEEP) Summer Academy