# Digitally Optimizing the Game of Ultimate Frisbee

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This project was conducted to develop a computer program that could model a situation involving decision making and control over several variables. In this case, the scientist developed a program that would model a game of Ultimate Frisbee in order to determine the optimal control over the variables of lead time, flight time of the Frisbee, and the location the Frisbee is thrown to on the field. The speed of a Frisbee was determined by repeatedly timing the flight of a Frisbee over a distance of 40 and 60 feet and taking the average of these times. This and other information was used in constructing the program. After the completion of the program, data was collected by running the program using lead times zero through five and flight times one through five, collecting 50 coordinate points for each set. The average y-value and null percentage (percentage of situations in which the defensive players covered all possible throwing locations) were taken for each time set and compared. Several trends could be found within the data collected. Smaller combined times yielded lower null percentages, while larger flight times with lead times less than four seconds tended to produce the largest y-value. The results tended to confirm common Ultimate tactics. The data shows that the longer a Frisbee is held on to, the less likely it is a beneficial pass will be completed. In addition, a medium flight time (between three and four seconds) seems to produce the greatest distance down field.

**Awards Won:**