Name logger by maintaining 2-3 m region to

Psychology, Behaviorism

Name Instructor NameCourse NumberDateMotion IntroductionTheobjective of this lab report is to study the kinematics in two-dimensionalmotion. This includes the relationship between different parameters likedistance, displacement, acceleration and velocity.

We have also proved thatvelocity is time integral of displacement and acceleration is time integral ofvelocity. The better understanding of these quantities was demonstrated throughgraphical analysis. Displacement is defined as an arbitrary parameter that ismeasured when an object changes its distance over time. When this change indisplacement is divided by change in time, it gives velocity. This is vectorquantity and can be calculated by: Equation1 Theoretically, velocity is also arbitrary andchange its position. When this object’s velocity changes within the certaintime frame, this forms acceleration. This change in velocity is defined as isgiven by: Equation2The experiment was carried out by Data loggerby maintaining 2-3 m region to plot position.

We have placed rangefinder at theposition of 0. 5 m away, which sense the position of moving student. We measuredthe distance of 2. 5 m from the detector and marked a location on the floorusing marking tape. The sensor was subjected to the different speed of aperson, which generate different kinematic graphs on a separate word file. DataFollowinggraphical data was fetched during the experiment for different parameters witharbitrary time. DataAnalysis Eachgraph was critically analyzed that were generated through LoggerPro. Figure.

1shows the straight line graph between position and time for average velocity. Since the person is moving in the direction towards the sensor, therefore thedirectional axis is taken as positive. The slope of figure. 1 was found to be 5m/s. Figure 2. Shows the graph between distance and time for constant negativevelocity, so there is transition from 0.

5m to 2. 5m on marking tape. Averagevelocity (V2) is -0. 6 m/s which is negative.

The slope of this trendis also negative. Figure. 3 shows that person is still in his position, sincethere is no change in position with respect to time.

There was no motion from 2. 5mto 0. 5m as a person doesn’t change its position with respect to time. The slopeis 0 m/s. and (V3) is 0m/s. The trend in Figure. 4 first shows nochange in position with respect to time, but increases after 2 seconds.

Thistrend was formed, when a person is delaying the time required to move towardsthe sensor and a person operating the Loggerpro may have switched it prettyearlier. Figure. 5 trend possess curvilinear behavior, there are manydistortions in the velocity and increases after 3 seconds. This shows that aperson has changed different positions at different time intervals. Figure. 6 shows a steady increase and decreasein the position with respect to time. The smallest distance that was coveredduring the interval was 0.

6 m and largest distance was 2. 6 m, marked as B and Arespectively on Figure. 6. For point, A and B average velocity is given by: = -0. 6m/sPoint C on Figure. 3 shows the fastest instantaneousvelocity of a person moving

towards the sensor position, as the trend obtainedshows decrease in positional gradient with a negative slope.

Some errors that we have encountered throughoutthe experiment were:

1. The accuracy of the experiment was limited toa certain position.

2. The person was not still during the course ofmotion and this results in distortion of the Graph. 2 and Graph. 3. 3. The delayed time between graphing and sensingof the position.

4. Human and parallax errors Conclusion Inconclusion, this was an immense learning experience related to physical kinematics. The fundamental principle was made clear through different graphs generatedthrough LoggerPro. Each graph has its own characteristic of the movement. The slopeof this line was calculated for each case. We have found that steeper the slope, the greater the speed of person moving towards and away from the sensor.

If theslope was decreasing, then person moves away from the sensor. There was also acase in which there is no movement through the interval of time, this happened thecase when the slope was almost equaled to zero. System, human and parallax errorswere the main causes of deviations between the actual and experimental values. These can be sort through re-experimentation and take care of mistakes in the secondattempt.