Effect of extreme dependency on computer essay

In the world today, computers are used In every field. Be It a major space exploration or a small chore Like cleaning our room. The use of computers has made our lives easier but at the same time a computer failure can make our lives miserable too. We trust computers more than we trust anything else these days. We use computers to communicate, share personal information, buy goods online, etc. We also trust computers with our safety.

Starting from house alarm systems and other safety vices we have now moved on to using computers to Test Car Crashes. Car crash analysis programs gained wide usage by the late 1 sass but ERA (Applied Research Associates) Personnel in the Silicon Valley Office have been engaged in studying the crash response of vehicles, occupant safety, and right-of-way structures since 1971(ERA Website, ah May). One of the major programs used for this testing is the DYNAMO which was developed at Lawrence Livermore National Laboratory (A Gift of Fire, Abase).

DYNAMO Is a computer simulation program that models the interactions of physical objects on Impact such as vehicle Impacts involving roadside structures such as signs, supports, guardrails and crash cushions. DYNAMO, suitable for solving problems involving rapid change, has had many applications in safety analysis. Laboratory analysts have used DYNAMO to study creditworthiness in a number of vehicle safety studies, where models of complex vehicles impact roadside safety structures and other vehicles, deforming under the impact.

The DYNAMO program uses a technique called the finite-element method where a grid is presupposed on the frame of a car dividing the car into a

finite number of small pieces or elements. The grid is then entered into the program along with data describing the specifications of the materials making up each element such as density, elasticity, etc. While reading the effect of a head-on collision on the structure of the car, the data can be Initialized to represent a crash Into a wall at a specified speed.

The program in return helps compute the force, acceleration, and displacement at each grid point and the stress and strain within each element. Using repairs programs, the simulation produces a picture of the car at intervals after impact. Roger Blight, manager of Tilt's (Texas Transportation Institute) Highway Safety Structures Program, says that computer program is more efficient than traditional crash testing. " The biggest advantage DYNAMO has over traditional crash testing is its cost-effectiveness," He says. With the program, we can look at a variety of scenarios that we typically can't study by traditional crash testing methods. We're often technologically or monetarily limited with what we can do In terms of real-world jesting, but we're not Limited by such constraints on the Website, 25th May). From different angles and speeds without the cost of repairing or replacing the structure or vehicle for each test. The program can be used to simulate various real- world conditions like roadside terrain.

Researchers can also graphically view these impacts from different angles to more fully study how the structure or vehicle reacts. They can delete elements, such as the roof or hood of a car, to see how internal elements are affected during the impact-? an effect that would be difficult to study in n actual crash test. Although it's not feasible to test all of these combinations

in actual tests, simulations allow more design variations to be analyzed without significant additional costs.

The cost of a real crash test can range from $50, 000 to $800, 000. The high figure is for building and testing a unique prototype for a new car design (A Gift of Fire, Abase). With these results, researchers can make adjustments to existing structures or develop improved structures. As safety standards in the transportation industry continually change to reflect new vehicle designs and operating speeds, the simulation program can help find a means for developing improved safety features or upgrading existing roadside structures to meet the new standards.

But still there is a long way to go. The sophistication and accuracy of these models have to be increased so that they better generate what really happens during a crash. Now let's look at the program from a skeptic's point of view and see how accurate and complete the data are that the program inserts. Force and acceleration are basic principles so they are pretty accurate. As for the properties of the materials such as tell, glass, aluminum, etc that is well known too.

But the behavior of some of these materials under abrupt conditions and at a high speed impact is less understood. As for the making up of the car in blocks that can cause some trouble too. As a car is smooth and not made up of blocks so the impact of a smooth object may be different than an impact of an object made up of blocks or grids. These are the only problems that the DYNAMO program is facing right now. If they can fix up these problems then more people would be able to trust their Car Crash Analysis.

As for the computed results that this program generates in comparison to actual crash tests on real cars, the results from the program correspond very closely to data collected in actual crash tests. That is why car crash analysis programs are replacing physical crash testing as a design tool for new cars, but this does not mean that physical crashes are being eliminated completely. Crash design programs are excellent design tools that enable increases in safety with far less development cost. We are putting our trusts in computers to help us make safer cars and at the moment it is doing a really good Job.