

Train Trek Intelligence™

Train Crash Leads to Amazing Advances in Model Railroading

To destroy a train is difficult Business. The short story writer, T.E. Lawrence, wrote about such things in his gripping tale "Blowing up a Train". Here he suggested that train destruction was an "exact science" and hard to do. After all a train is big, and made from tons of steel. Yet within seconds, on the brisk wintry morning of December 12, 1988, three huge passenger trains crumpled like fragile paper-Mache toys.

The first, a daily commuter train from south England was sitting at idle only a quarter mile from Chapham Junction, Europe's busiest railway intersection. Alex McClymont, the conductor, was out of his train. He was using a trackside phone to report a faulty signal. It was too late! The conductor watch as an express commuter train from the coast rounded the curve at 60 to 70 miles per hour and smashed into the rear of the stopped train. Only seconds later, a third train, an empty passenger train speeding in the opposite direction, smashed into the wreckage. This was one the most terrible train disasters in European history, killing 33 and injuring more than 110 of the 1,000 passengers involved. Rescue workers labored for hours to free victims crushed by the wreckage. This horrible disaster was the result of a simple signal fault.

A Simple Signal Fault Spells Disaster

The disaster made world news. And worlds away, some three thousand miles to the east, a young engineer read about the tragedy. Danny Rittman, just recently graduated achieved two degrees, one in mechanical engineering, the other in electrical engineering. Since his childhood he had been a Marklin model railroad enthusiast and owned an extensive personal collection of Marklin equipment. With his model collection, Danny had one foot firmly rooted in the analog technology of the day. With his newly earned engineering degree he now had the other planted in the digital technology of the future.

Digital Solutions for Model Railroads Come of Age

With the European train wreck, seeds of an idea were sown. Danny realized that with a computerized digital system the terrible European train wreck need never have occurred. He set out to transform his model railroad system into a digital software system that could simulate real world failures and prevent accidents.

In the beginning, a digital software system was developed as a base for the necessary serial communications. As the system evolved, the capacity to fully control all train operations was perfected. Turn-outs, signals, sensors, cranes, bridges, special-effects, cars, turn tables and other features came under digital control.

Real Time Simulation is Born

The most challenging feature of the program was the ability of the software tool to predict train movements on the layout. This is where real time simulations of real life situations were born. The system had to have the ability to make critical decisions in real time. For example, assuming that one or more trains had a malfunction at the same time, and had to stop, or be rerouted, the software would have to give the right correction to all other routes ... immediately.

In this way, the main goal of the system, accident prevention, could be attained. In case of any stop, due to any reason, the train route would need to be blocked and isolated from the rest of the track layout. Trains that were supposed to pass through that route would be automatically switched to an alternate plan. And if possible, through rerouting and speed adjustments would make their original destination on time. Safety first, destination second.

Simplex Theory is the Heart of the Program

Danny enrolled in a special university math course to learn "Simplex Theory". This training would enable him to create algorithms from mathematical formulas. He would then be able to process continuous input of simultaneous situations like speed, timing, starting, and stopping, for each train in the system. This is the heart of the program. In this way, the system could constantly predict all kinds of events. One, of course, would be the potential accidents. The current program algorithms took years to develop. The program is called Train Trek™. You might say that Train Trek™ sees everything that is happening in your layout as a huge puzzle, and constantly solves this puzzle in millions of ways always keeping in mind the best solutions for the worse case scenarios.

A New Dimension in Model Railroading

Over the years, Train Trek™ has become an incredible tool. After months of real time tests, the latest version has emerged. Today Train Trek™ is a windows application that fully controls a digital model train system. With the fully automatic control feature, the user can create real time simulations. For example, the user can cause one or more trains to stop, and then watch the software handle the situation. In such a case, Train Trek™ will turn switches, activate lights, stop some trains at stations, change routes, and do whatever is necessary to prevent accidents. The more complicated a situation is, the more fun the user can have watching how the program solves "the puzzle". Of course user can choose 'Warning Mode' and then Train Trek™ will alert only.

Artificial Intelligence is introduced to Model Railroading

In case of overloading, or an emergency situation, Train Trek™ might even shut off the entire system. It is an amazing concept, but Train Trek™ is actually a live application that actually learns from experience. As the program operates, it keeps the information in its database for future use. The next time a similar event occurs, Train Trek™ might already be trained to handle this situation. This is the first time a computer's artificial intelligence has been used for model railroad applications.

Other features have been added during the years of development. With one special feature, Expert Engineer™, you set the limits. Here you can simultaneously operate up to seven trains in manual mode from one operations screen, with complete start, stop and speed control for each train. "Communications Control" provides an adjustable "delay factor". This adjusts capabilities to a variety of systems. The system can be adjusted for Pentium based machines (Recommended Pentium III and Higher), and custom CPU's. This feature scales your train's speed for life like performance. The "Inventory Control" option allows the user to record and maintain vital modeling inventory such as locomotives, and professional literature browser.