

Real time viewing of World Orienteering Championships possible with fast 3D visualization



The 2003 World Orienteering Championships held this August in Switzerland marked a milestone in technological history. For the first time ever, the winning routes were able to be visualized in near real-time with Erdas IMAGINE® VirtualGIS software from Leica Geosystems.

Left: Simone Luder orients herself during the race on the way to the next post on her map. Her route led the Swiss athlete to a gold medal.



Above: The posts and the routes chosen by the three best competitors were visualized in the target area for spectators on the projection screen with the help of Leica Geosystems' Erdas IMAGINE® VirtualGIS.

Below: Posts are interim goals. Here, Marian Davidik from Slovakia checks in. Center: Thierry Gueorgiou, from France, on the way to a gold medal in the classic-distance final.



male and female runners were shown simultaneously in the movie, their different routes were easy to spot in the strategic post-race analysis.

IMAGINE Virtual GIS at the core

As a basis for realizing the 3D visualization with IMAGINE Virtual GIS, MFB-GeoConsulting (www.mfb-geo.com) used a high-resolution digital elevation model (DEM) and the digital orienteering race map (pixel map) on the one hand, and vector data of the routes taken by the runners on the other.

It was a particularly technical challenge to achieve optimum rendering, since the geometry of the 3D scene was constantly changing and therefore had to be permanently recalculated. An organizational challenge resulted from the fact that precise data on the starting point, posts and goal were only announced shortly prior to the start of each of the orienteering races.

For that reason, the corresponding symbols for routes, posts and runners were generated and imported into IMAGINE VirtualGIS and linked within

A great deal is demanded from orienteering runners: in addition to being athletic, they must also have good spatial visualization ability. Only those runners who are able to analyze the task provided and are the fastest to implement it on the ground, can win. The posts that must be passed are stationed in forests, fields and urban areas. How can this be visualized for a large number of spectators and an excited television audience?

Enthusiastic athletes and fans

MFB-GeoConsulting in Messen had a solution that enabled the 3D visualization of the 2003 World Orienteering Championships in near real-time with Leica Geosystems' Erdas IMAGINE® VirtualGIS. Just minutes after the finish line was crossed, the routes of the three best male and female runners were digitalized, played back virtually before the public and partially televised using a high-resolution scale model and the digital orienteering map. Since the three best

the system before the events. That enabled the races to be visualized as they were being run – practically in real-time. The only data that had to be entered at the time of the starting signal were the new, effective geographic coordinates of the starting point, the individual posts and the finish. In order to attain the best possible representations of the terrain and the courses run, the optimum angles and perspectives for viewing the terrain were determined during the race in conjunction with an orienteering specialist. That let both athletes and spectators follow the race exactly and analyze the race after the fact.

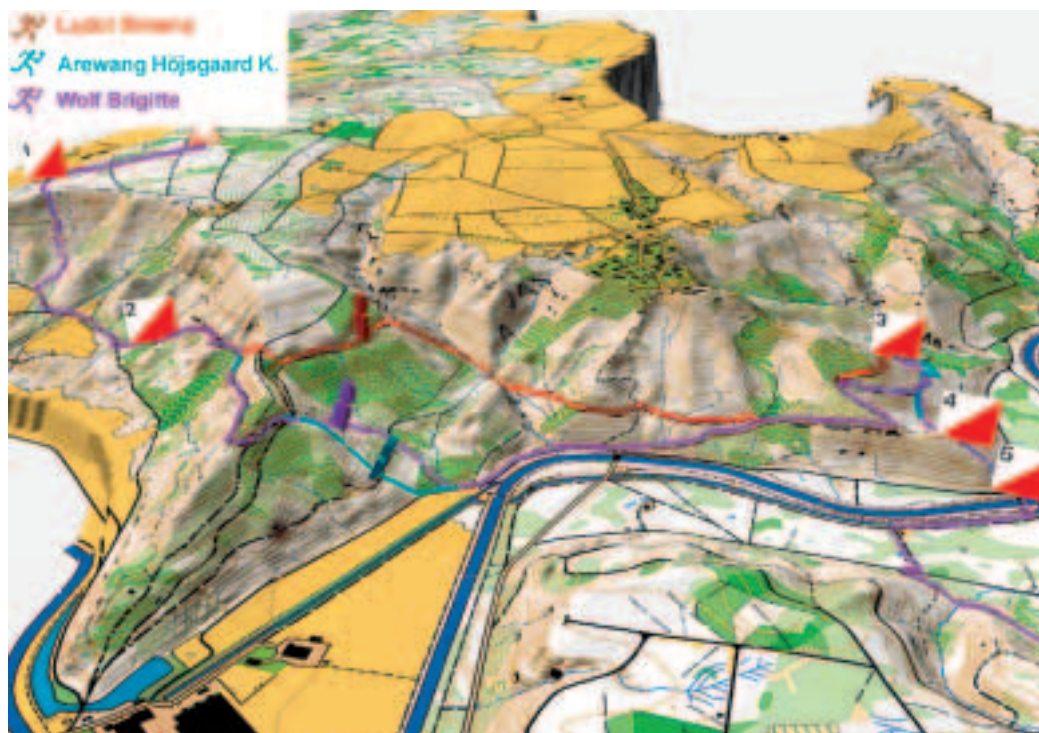
Routes of the best three runners in three dimensions

Just minutes after the finish line was crossed, the routes

“Leica’s Imagine VirtualGIS 3D animation made the most important aspects visible.”

Felix Arnet

of the three best male and female runners were digitalized as ATL files in ASCII format with geographic coordinates and chronological data and then converted into shape files. In order for the race to be compressed down to a few minutes and played back in virtual time, the time base had to be compressed as well. For the route analysis, DTM, digital orienteering map and the shape files (routes run and time information) of the three best runners were integrated and then played back for the audience on a giant



video screen just a few minutes after the finish line was crossed, with parts of the race being broadcast on television. Since the three male and female runners were shown simultaneously in the movie, the different routes they selected were clearly recognizable.

Never before had organizers, athletes, spectators and television viewers been treated to such deep insights into the runners’ strategies and the races.

Felix Arnet from the organizing committee of the 2003 World Orienteering Championships commented: “One particularly positive aspect worth mentioning was the fact that the 3D visualization enabled people to really see how steep the terrain was. The runners’ different competitive strategies were also clearly visible: you could see how the athletes left the post, decided on different routes, ran in their selected directions and then started getting closer and

closer together as they approached the posts. That was really impressive. In general, it can be said that the Leica Imagine animation made the most important aspects of the World Orienteering Championships visible.” It looks as though it’s likely to become a standard at such events.

Michael Baumgartner

Above: The terrain, orienteering symbols and routes run by the top three runners were visualized in three dimensions using Imagine VirtualGIS software. Spectators in the target area were thus able to follow the final victory run of world champion Simone Luder and those of her toughest competitors.

Left: An impressive final sprint from Jamie Stevenson in Rapperswil on Lake Zurich: the Brit was crowned world champion.

Right: He did it – a gold medal! Swiss runner Thomas Bührer won the long-distance race to become world champion. All photos: swiss-image.ch/ Remy Steinegger

