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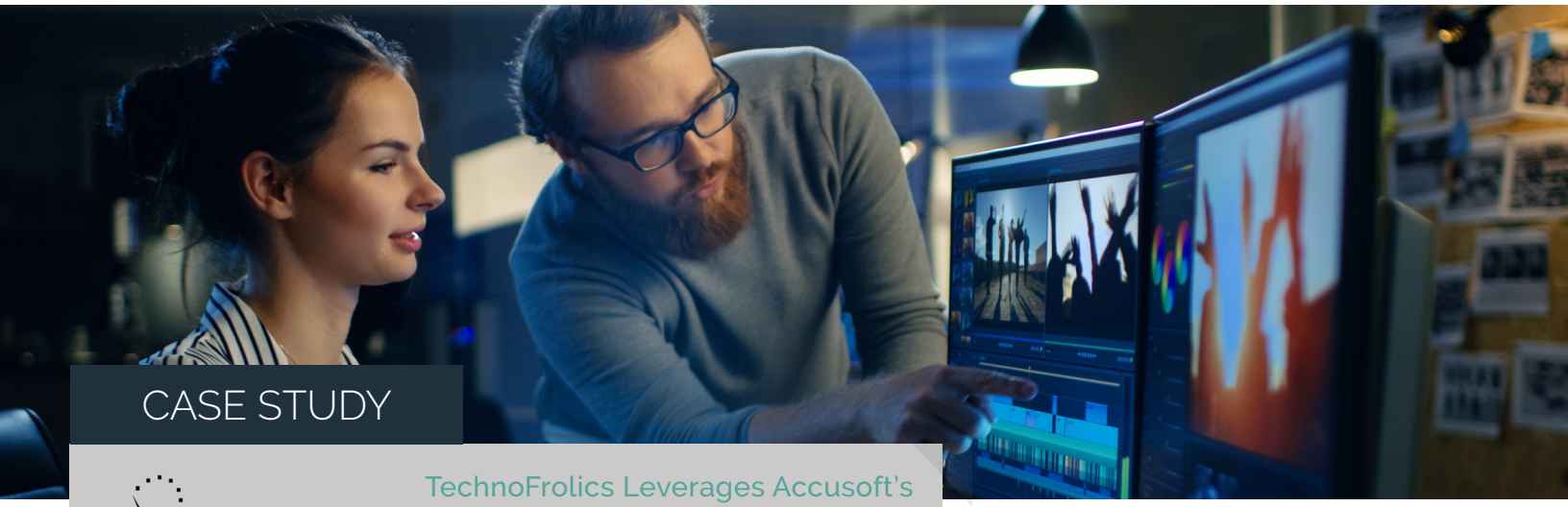

CASE STUDY

TechnoFrolics Leverages Accusoft's Compression & Decompression Technology to Transform Video Into an Interactive Exploration

Video content is an essential form of illustration and expression, whether it be for brand messaging or artistic pursuit. TechnoFrolics' Spin Browser™ system was originally inspired by a simple but profound shift in perspective - from the conventional view of video as a produced, passively watched experience, to that of a vast ocean of imagery, rich in information and data, patterns, and behaviors waiting to be explored.

Overview:

A core TechnoFrolics' exhibit technology, the stainless steel Spin Browser dial combined with FrameGlide software application (FG|SB), enables users to move ultra-fluidly through time and space via interactive traversal of video content.

"Despite video's ubiquity, **there are untapped breadths and depths to the medium that open up when content is viewed not just as a relatively short 'produced experience,'** but also as a beautiful and educational data set, where content provided for exploration can be orders of magnitude longer than the production norm. For example, in a conventional interactive museum exhibit, a video clip might be just 30 seconds long. With an FG|SB installation, it is not uncommon to have many hours' worth of explorable content," remarks David Durlach, Founder and Director of TechnoFrolics.

To be experientially effective, such exploration **requires near-instantaneous response to user interaction** (for example, the turning of the Spin Browser dial), as well as perfect image clarity and "stutter"-free operation. It was here that Accusoft's ultra-fast JPEG decompression and compression algorithms entered the picture.

Challenges:

In practical terms, due to how the human perceptual system works, a fluid experience requires latency between hand motion and movement through video to be very low, ideally no more than 30 milliseconds. Exceeding this threshold must be avoided even when the frame path is determined on the fly, as it is with the FG|SB system vs. the significantly easier task of progressing through content when the frame-order is known ahead of time as it is in normal video play.

With the FG|SB system, video frames may be discontiguous, potentially separated by tens of thousands of frames in the middle, run backwards or forwards, etc. Additionally, amounts of video data to be explored are often enormous - up to millions of frames and many hundreds of gigabytes in size.

> ***"We started using Accusoft's tools decades ago when even simply playing a 640x480 video without 'stutter,' on a typical PC, was a real challenge."***
>
> David Durlach,
> *Founder and Director, TechnoFrolics*

Challenges Continued:

This presented a challenge. TechnoFrolics needed a way to compress and decompress video frames very quickly - and without loss of image quality. Thus, technical requirements included:

- Significant size compression for storage
- Outstanding image quality
- Ability to decompress (and, for live capture, compress) with speed and accuracy
- All this without dependence on prior or future frame content

During the FG|SB system's original development, a search was made to find a very fast codec because typical methods available, even as implemented by major players in the field, were simply too slow.

Results:

TechnoFrolics is now way past 640x480 movies. In a recent installation, they implemented forward and backward motion, as well as simultaneous left/right panning in dual 4400x1200 videos synchronously shot from front/back for a guide-boat rowing interactive museum exhibit. They now also offer live capture systems where users can explore, backwards and forwards, fast and slow, from the inception of filming up to the current moment.

"Accusoft's jpeg decompression code was so much faster than typical implementations that our environment, utilizing their algorithm, was one of the few ways anyone could simply play a 640x480 video smoothly on typical PC hardware of the day - let alone traverse an arbitrary frame path, which Accusoft wonderfully enabled. And when I say "faster", I do not mean by just a few percent - we were talking about (to the best of recollection) more like doubling the speed. It was very significant - both numerically and, most importantly, perceptually," recounts Durlach.

Accusoft's decompression and compression algorithms are key in this context, where **lightning swift compression and decompression are essential in order to continuously compress and stream captured content to disk,** while allowing users, 100% in parallel, to enjoy crystal clear fluid interactive explorations.

The FrameGlide | Spin Browser system provides a unique tool for exploring video, allowing interactive explorations at speeds from stop-frame to +/- 1,000,000 times normal rate, across linear, exponential, and customized temporal pathways. The environment supports 4K and 3D, as well as custom behaviors such as graphical and audio overlays triggered by location, dwell time, and dial traversal speed.

"Accusoft was instrumental in helping make this all happen," summarizes Durlach.

About TechnoFrolics

TechnoFrolics was founded in 1988 by David Durlach and is based in Somerville, Massachusetts. TechnoFrolics' interactive exhibits and artworks combine technology, art, the natural sciences, and play, providing users with memorable experiences of both natural and engineered phenomena. Their installations are in science and children's museums, aquariums, zoos, and nature centers across the globe, as well as having been used at the 2010 Olympic winter games in Vancouver, and by doctors at medical conferences and when performing patient procedures.

About Accusoft

Accusoft is a software development company specializing in content processing, conversion and automation solutions. From out-of-the-box and configurable applications to APIs built for developers, we help organizations solve their most complex content workflow challenges. Our patented solutions enable users to gain insight from content in any format, on any device with greater efficiency, flexibility, and security.