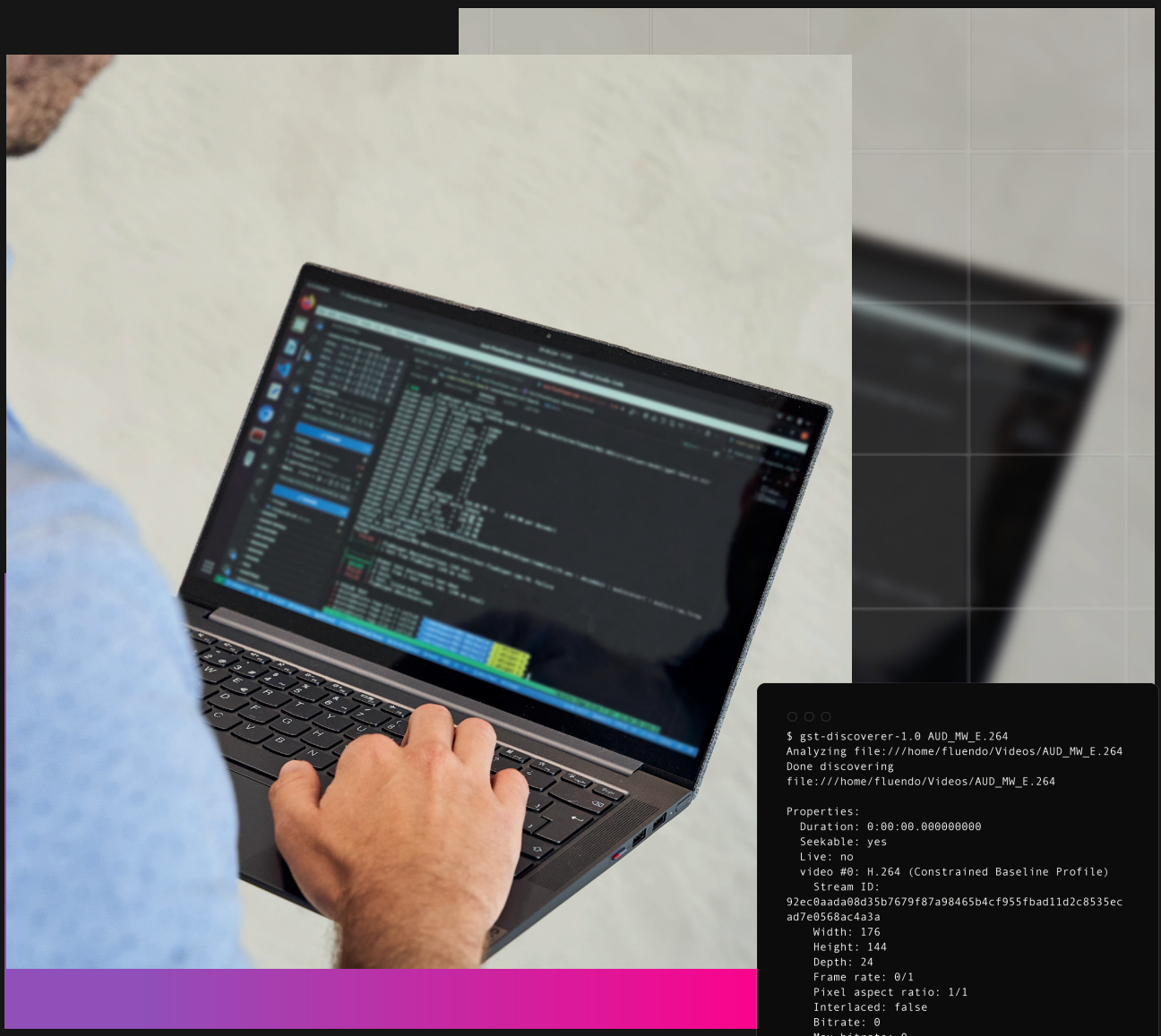
fluendo

Pioneering the future of multimedia

GStreamer experts since 2004



```
$ gst-discoverer-1.0 AUD_MW_E.264
Analyzing file:///home/fluendo/Videos/AUD_MW_E.264
Done discovering
file:///home/fluendo/Videos/AUD_MW_E.264

Properties:
  Duration: 0:00:00.000000000
  Seekable: yes
  Live: no
  video #0: H.264 (Constrained Baseline Profile)
    Stream ID:
92ec0aada08d35b7679f87a98465b4cf955fbad11d2c8535ec
ad7e0568ac4a3a
    Width: 176
    Height: 144
    Depth: 24
    Frame rate: 0/1
    Pixel aspect ratio: 1/1
    Interlaced: false
    Bitrate: 0
    Max bitrate: 0
```

Content

CONSULTING SERVICES | CASE STUDY

fluendo

→ Video surveillance application: stabilizing and feature improvement

The company is a global leader in advanced security and surveillance technologies to safeguard businesses, schools, municipalities, hospitals, and cities worldwide. It has over 130 employees and generates over $27 million in revenue annually.

About the project

The client's hardware used an application for Windows that was no longer supported, and they decided to use GStreamer to make it a multiplatform (Win, MacOS, Linux) tool. The application's front end was built with C#, with a layer in C/C++, but the system was unstable and had memory leaks and crashes. We got involved in the middle of the development, dividing the project into two phases: **stabilizing the system and adding different features like masking and wrapping.** Our expertise allowed us to test different approaches and get their app working before the product's launch.

Industry
Security and video surveillance

Services
Staff-augmentation | Guidance | Training | Bug-fixing

Technologies
GStreamer | Windows | C++ | D3D11 | Audio codecs | Video codecs | RTSP

What we achieved

1. Provide team's expertise to help develop a **Windows native application** based on GStreamer.
2. Doing a big refactor to **fix bugs** and improve the **performance and stability** of the application.
3. Fluendo provided **GStreamer training** to the client's team to be self-sufficient.

Let's talk!
Jordi Girona, 29. Barcelona, Spain, 08034.
contact@fluendo.com

+34 936 03 42 35
fluendo.com

CONSULTING SERVICES | CASE STUDY

fluendo

→ Digital microscope: video correction algorithms

The company designs electronic and embedded firmware solutions, developing products, components, modules, and systems for its clients. It has over 15 employees and generates over $5 million in revenue annually.

About the project

The client's solution is embedded in a microscope 4K camera. Their Gstreamer pipeline needed some video plugins that fixed both the chromatic aberrations and spatial distortion generated by the system's lenses and digitally reduced the glare in an image.

The project consisted of **creating and implementing a correction block for its execution in the GPU of an Nvidia Jetson**

Industry
Electronic and firmware development services

Services
Guidance

Technologies
GStreamer | Video processing | CUDA | NVIDIA | Jetson

What we achieved

1. Implement and validate with the client of the correction **algorithms in Python.**
2. Implement a **GStreamer plugin** with three elements using the algorithms validated.

Let's talk!
Jordi Girona, 29. Barcelona, Spain, 08034.
contact@fluendo.com

+34 936 03 42 35
fluendo.com

fluendo

→ Drone video: efficient capture in challenging conditions

The company designs and develops specialized drone systems for inspections and cloud portals with data analytic tools to generate reports and geotagged findings with a precise location in 3D asset models. It has over 20 employees and generates over $8 million in revenue annually.

About the project

The client's application allows drones to capture 4k video at 60fps to inspect indoor and hostile environments with little or no ambient light. They detected certain artifacts in the recordings, and the time to capture snapshots was too long. Our expertise allowed us to offer them a **GStreamer-based zero-copy solution that runs on an NVIDIA Jetson.**

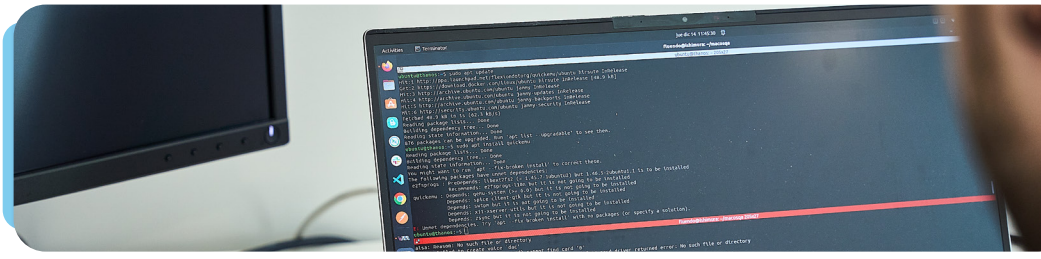
Industry
Inspection drone manufacturing

Services
Bug-fixing

Technologies
GStreamer | H.264 encoder | NVIDIA | Jetson

What we achieved

1. Help the client solve the occasional **freezes and artifacts in the H.264** video that was being saved to the drone's memory card.



Let's talk!
Jordi Girona, 29. Barcelona, Spain, 08034.
contact@fluendo.com

+34 936 03 42 35
fluendo.com

fluendo

→ Surveillance video system: pipeline optimization for zero-copy hardware acceleration

The company builds a modern AI camera system to create safer workplaces and more intelligent operations for every business. It has over 100 employees and generates over $14 million in revenue annually.

About the project

The client develops global hardware and software for video surveillance systems. Their solution uses AI to analyze video flows from multiple IP cameras, which are later aggregated and encoded to their client web application for real-time streaming.

Their encoding/streaming system was based on FFmpeg, but as they switched to GStreamer, they required our help to **perform a deep analysis and suggest possible improvements to their pipelines.** Our expertise in this framework allowed us to **optimize them for NVidia hardware acceleration.**

Industry
Software development

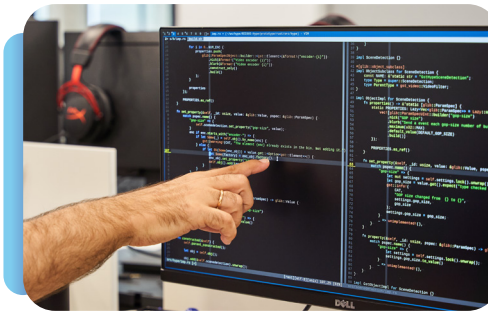
Services
Guidance

Technologies
GStreamer FFmpeg WebRTC NVIDIA

What we achieved

1. Deep analysis of **pipelines and source code.**

2. Proposal of a different architecture to ensure **zero-copy, hardware acceleration,** and interconnection with the **WebRTC streaming protocol.**



Let's talk!
Jordi Girona, 29. Barcelona, Spain, 08034.
contact@fluendo.com

+34 936 03 42 35
fluendo.com

fluendo

→ HbbTV: MPEG-DASH support in an ARM based SoC

The company is one of the biggest chipset vendors for wireless communications, high-definition television, handheld mobile devices, navigation systems, consumer multimedia products, and optical disc drives. It has a revenue of over $16 billion and more than 10,000 workers.

About the project

The client needed to deploy embedded platforms for the TV manufacturing markets and **required a solution for HbbTV 1.5 and 2.0 playback.**

Our expertise in HbbTV and GStreamer allowed us to create a bridge between the platform Audio/Video interfaces and the HbbTV-capable browser.

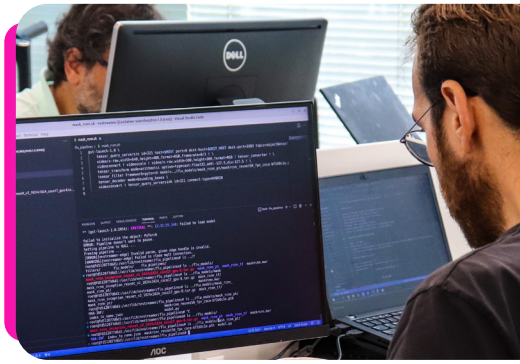
Industry
Hardware manufacturer

Services
Outsourcing

Technologies
MPEG-DASH · Gstreamer · HbbTV · ARM · Linux

What we achieved

1. Design and implementation of an **IPTV streaming standard** for embedded platforms.
2. Usage of custom and proprietary vendor Audio/Video API through the **creation of specific GStreamer plugins.**



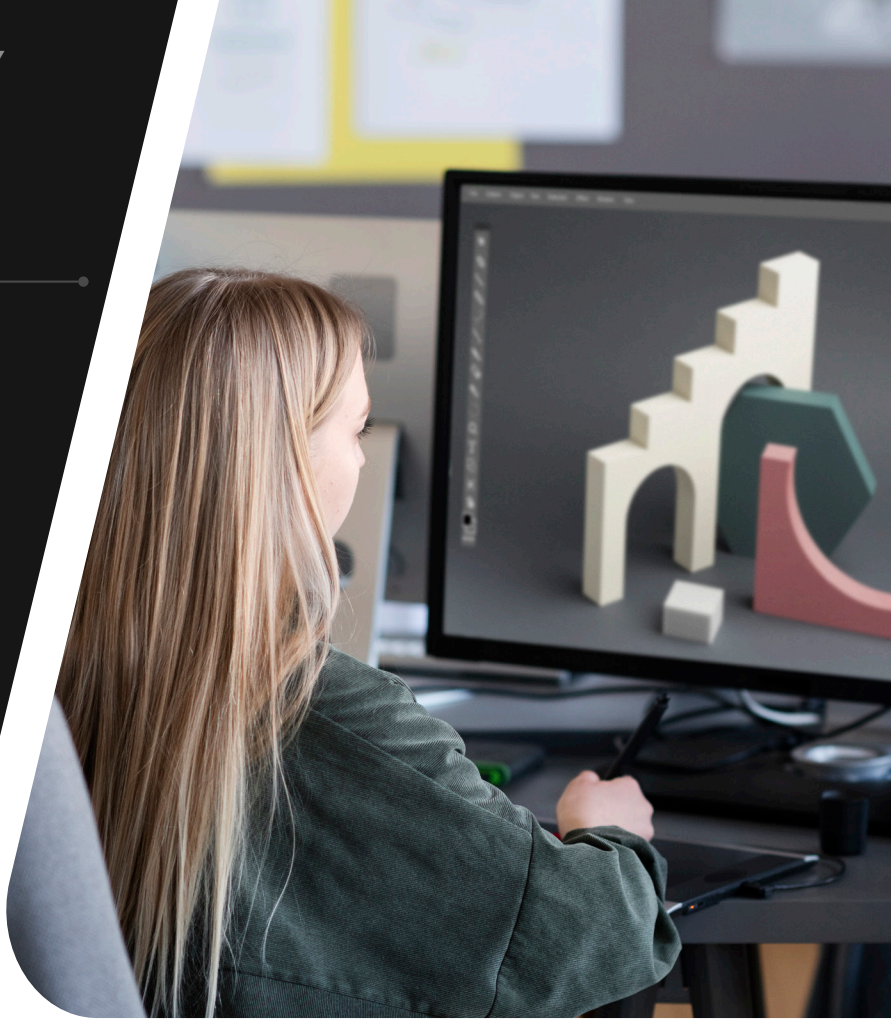
Let's talk!
Jordi Girona, 29. Barcelona, Spain, 08034.
contact@fluendo.com

+34 936 03 42 35
fluendo.com

fluendo

→ 3D modeling software: analysis and optimization

Founded in 2019, the company is the only 3D creation platform integrating social features with powerful design tools to create a fully collaborative user experience. It has over 20 employees and generates over $4 million in revenue annually.



About the project

The client was developing a 3D remote rendering application using CUDA on an NVidia graphic card to generate the 3D scenes. They required us to **optimize their GStreamer system to reduce CPU usage.** Also, the high latency was a problem for a real interactive experience.

With our coding expertise in this framework, we helped them **improve the software's performance to be production-ready.**

Industry
3D modeling software

Services
Guidance | Optimization

Technologies
Gstreamer | NVIDIA | CUDA | Streaming protocol | H.264 encoding

What we achieved

1. Study the client's current implementation and **detect and analyze potential flaws** concerning their encoding/streaming pipeline.

Let's talk!
Jordi Girona, 29. Barcelona, Spain, 08034.
contact@fluendo.com

+34 936 03 42 35
fluendo.com

Stop taking risks.
Start finding **solutions.**

For more information visit fluendo.com