Lynx ELMNTS System

Five embedded demonstrations in one portable exhibit

Matthew Gage | Nathan Schaner | Emily Sherry | Brennan Neitzel | Nathaniel Tillery | James Patterson

Grand Valley State University

The project aims to create a portable demonstration system that shows how Lynx software can power real-time graphics, camera tracking, and radio-signal processing. The goal is to give trade-show visitors and customers a hands-on, visual way to understand what the software can do and how it can be applied to defense and aerospace customers.

Automotive Dashboard

Animated vehicle display shows live embedded graphics and continuously changing data.

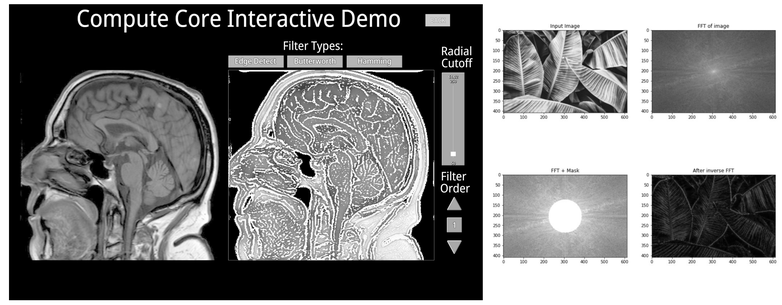
- Animation controller drives display. Renders 3D car and road using GPU

Aviation Demo (IFE)

Plane graphics connect simulated flight data, terrain, and responsive display windows.

- Plane sim and terrain generator feed the UI
- Shows aerospace-style graphics running on GPU

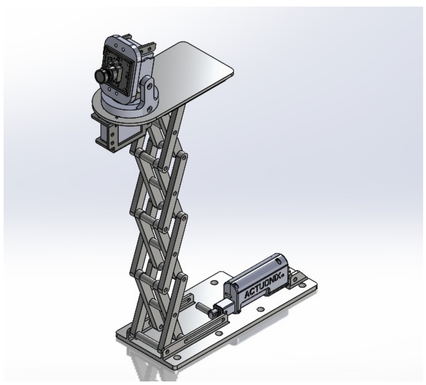
MRI Processing

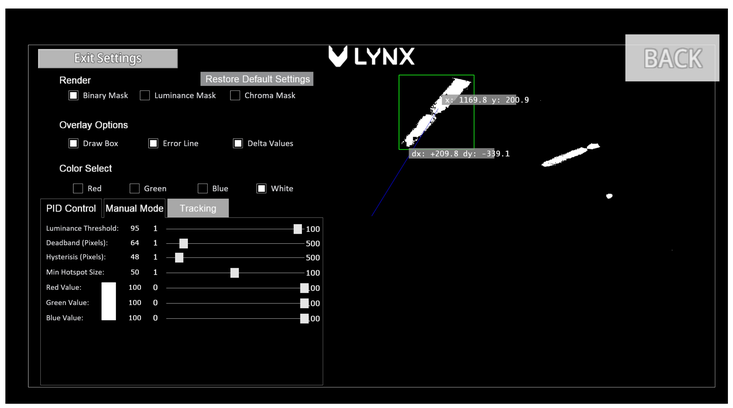


Medical image filtering demonstrates GPU shader visual processing using FFT transforms and filtering.

- 2D FFT pipeline supports Edge detect, Butterworth, and Hamming filters.
- Processed imagery renders to display.

Camera Tracking / Identify



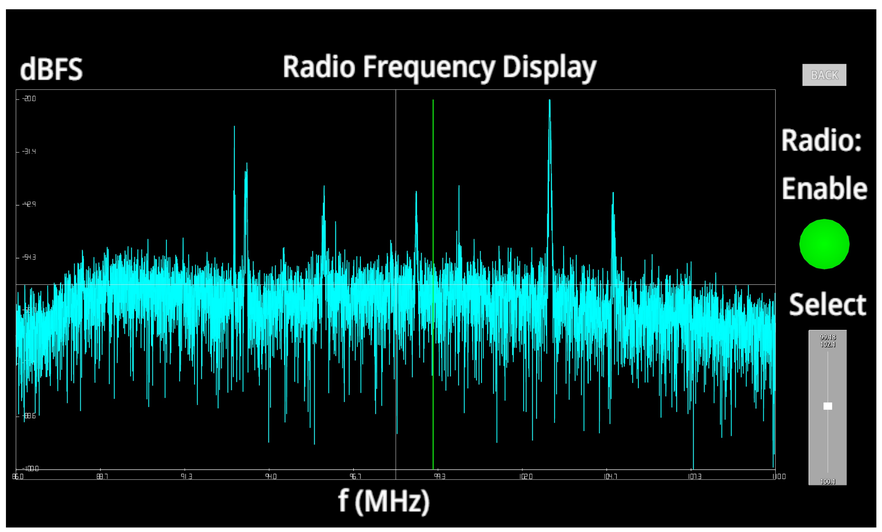


An actuating pan-tilt camera identifies bright targets and can track them with a feedback system.

- Identify mode creates boxes around hot spots based on chroma and luminance values.
- Track mode commands the STM32 motor controller to recenter the target in center of frame.
- PID tuner can be adjusted and tuned in real time to optimize camera tracking response

RF Demo

Software-defined radio data becomes live FM-band power spectral density plot.



- LimeSDR captures FM band, 88-108 MHz IQ data for processing.
- GPU FFT output creates Power Spectral Density Plot and optional radio playback.

Acknowledgments: Lynx Software Technologies, GVSU Padnos College of Engineering, Dr. Brian Krug, and Mark Snyder

ELMNTS = Engineering Low-Cost Modular Technologies System