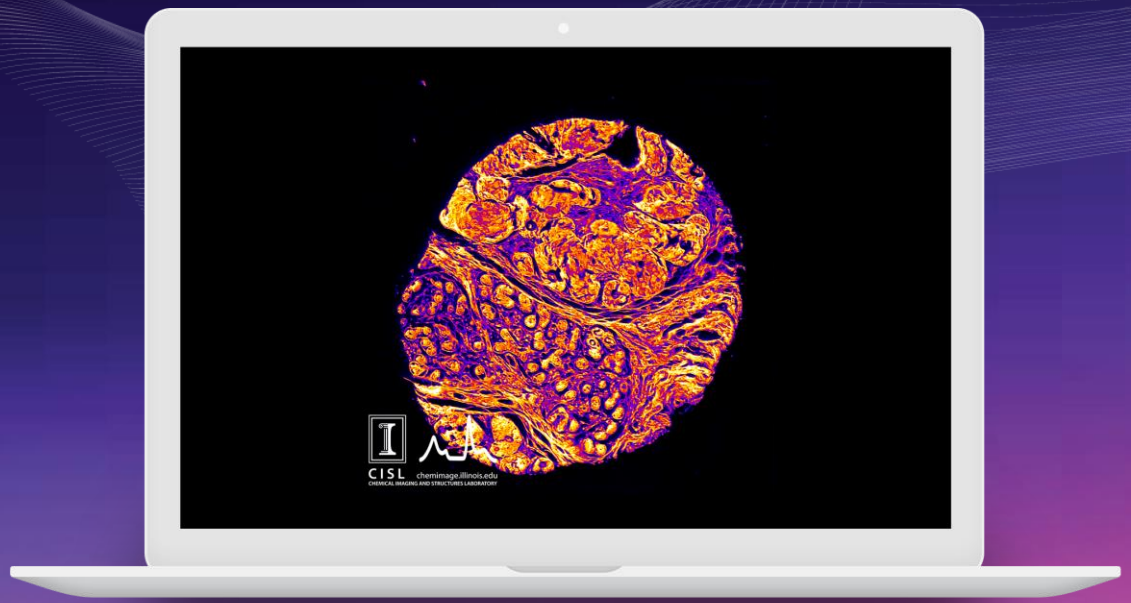
SCiCHART

CASE STUDY



ILLINOIS
UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

Customer

University of Illinois Dept. of Bioengineering, Mechanical Science and Engineering & Electrical Computer Engineering

Industry

Infrared Spectroscopy, Scientific

Realtime Visualization of High Definition Infrared Spectroscopy Data for Diagnostic Tissue Imaging

Realtime Visualization of High Definition Infrared Spectroscopy Data for Diagnostic Tissue Imaging

Requirements

Display accurate real time charts from Fast Infrared Chemical Imaging for high data-sets (1 million points). Collected from a Quantum Cascade Laser (QCL) onto Heatmaps and Line charts for both development and end-user perspectives.

Data & Preconditions

- Data is provided by a custom IR microscope with commercial QCL sources
- Outputs up to 100million data points
- Previous charting was only capable of displaying less than 1% of data points
- To use line annotations to show the cursor position
- Previous charts lacked the flexibility & customization

Project Motivation

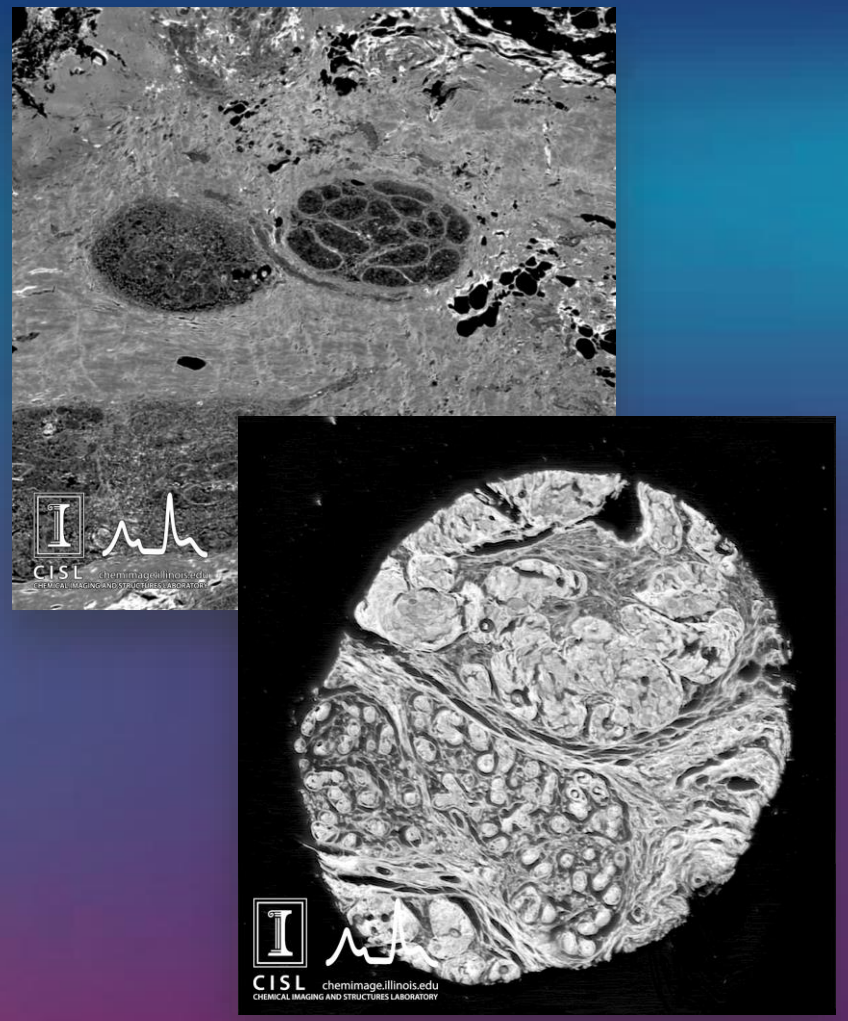
Infrared (IR) spectroscopic imaging systems are powerful tools for visualizing molecular microstructures of a sample without the need for dyes or stains. Table-top Fourier transform Infrared (FT-IR) imaging spectrometers, the current technology can record data efficiently but require scanning the entire spectrum with a low throughput source

The advent of QCL has accelerated IR imaging but results in a different type of instrument, approach and data

Higher intensity source provides higher signal per channel

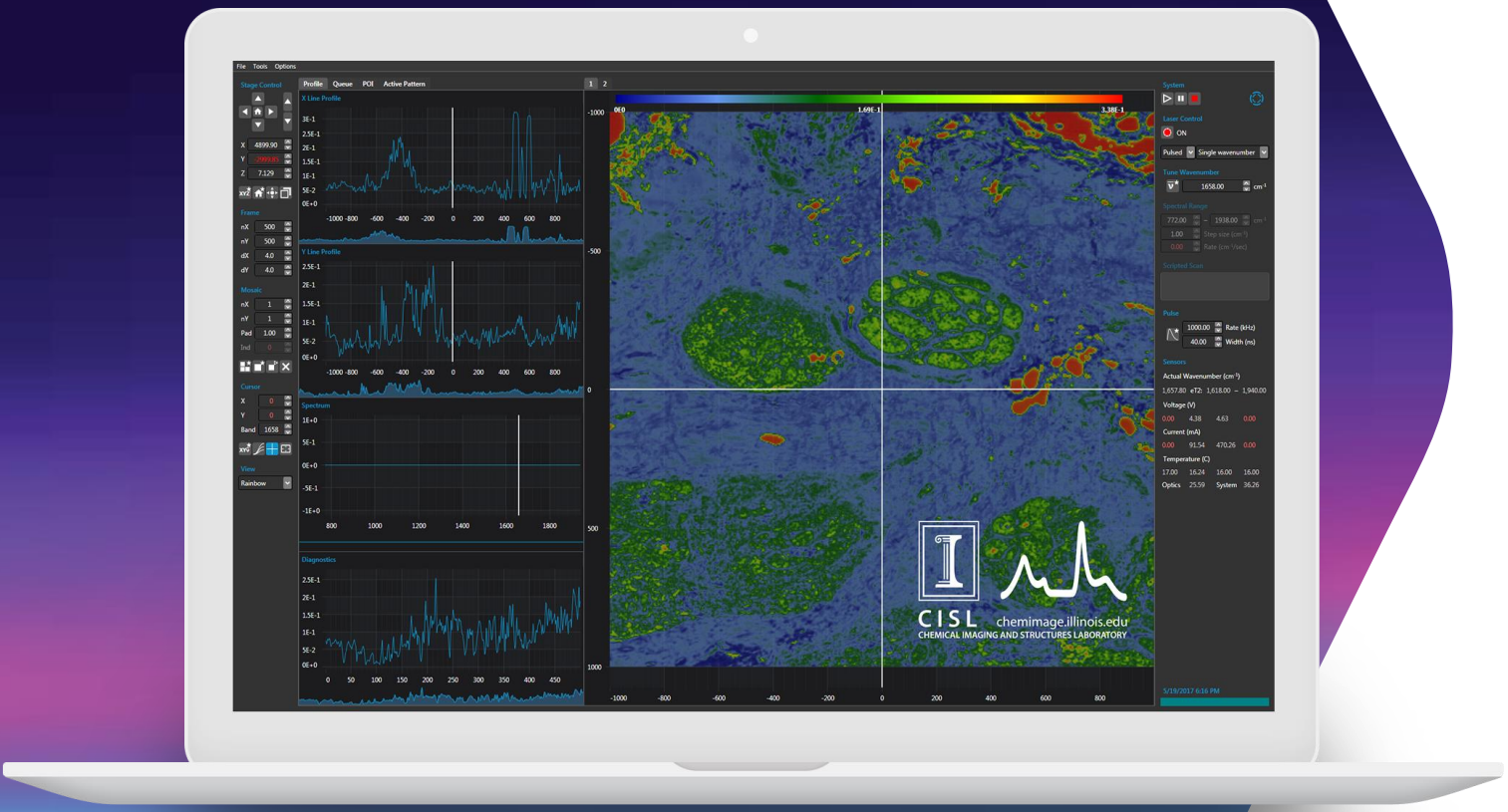
Multiplexed QCL units permit High Definition IR imaging assuming charting can interpret the data sets.

Working on High Definition IR Spectroscopy, the University of Illinois Bioengineering and related departments were aiming to



© 2022 SciChart. All rights reserved.

SciChart.WPF



Demonstrate the spectral and spatial fidelity of their innovative system rivalling FT-IR. Their configuration provided:

- A speedup for equivalent spectral-to-noise ratio compared to the best spectral quality from high-performance linear array systems.
- A 10 fold increase in resolution in relation to pixel size.
- 3-orders of magnitude smaller time per essential spectral frequency in the scanning of large tissue microarrays

Previous iterations of Charting solutions were unable to keep up with the output datasets from the HD array, often in the 100 million data range.

To deal with their Large Datasets in Realtime, their project needed a High Performance Charting solution capable of handling Big Data. With the need to handle 1 million points and store 100 million in the background of a heatmap whilst retaining line annotations for interpretation they turned to SciChart High Performance WPF Charts.

CASE STUDY

© 2022 SciChart. All rights reserved.

ILLINOIS UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

SCICHART

Solution

ILLINOIS
UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

High Performance Charting
SciChart WPF charts were employed to handle 1Million points of data in Realtime whilst maintaining a smooth user interface.

Custom Annotations with SciChart's Rich Core WPF Charting API
Overlaid line annotations to show cursor position and information.

Extensive Charting Examples
No other WPF Charting vendor supplies such comprehensive examples and documentation. Our example suite provided Heatmap and Line charts ready to handle their data sets.

- Displays 1,000,000 points in Heatmaps and Line charts
- Realtime interpretation of Bigdata sets
- Fast and Smooth charts without UI slowdown
- Custom overlaid Annotations

About SciChart

SciChart is a cross-platform WPF, iOS, Android and Xamarin Scientific & Financial Charting Library.

SciChart supports rendering of complex, interactive, real-time charts with many millions of data points for demanding scientific, medical and financial applications and embedded systems that require high performance, rich interaction and smooth updates.

Find out more about SciChart at https://scichart.com

SciChart Ltd
16 Beaufort Court, Admirals Way,
Docklands. E14 9XL. London.
United Kingdom

Web: https://www.scichart.com
Contact us at: sales@scichart.com

© 2022 SciChart. All rights reserved.

SCICHART