

Developing a New Clara/Xavier-based Platform for Real-Time Ultrasound Imaging



Richard Tobias
CEO/CTO

www.cephasonics.com

We Are Cephasonics Ultrasound



256 channel ultrasound

Open AI-enabled Platforms for Ultrasound

- For scientific research expanding the boundaries and uses of ultrasound
- Helping create and deliver innovative new commercial ultrasound imaging solutions

We Are Cephasonics Ultrasound



Ultrasound software platforms

Reimagining Ultrasound

Enabling a revolution in ultrasound-based healthcare support with Xavier, AI and a new approach to designing ultrasound systems

Ultrasound Today

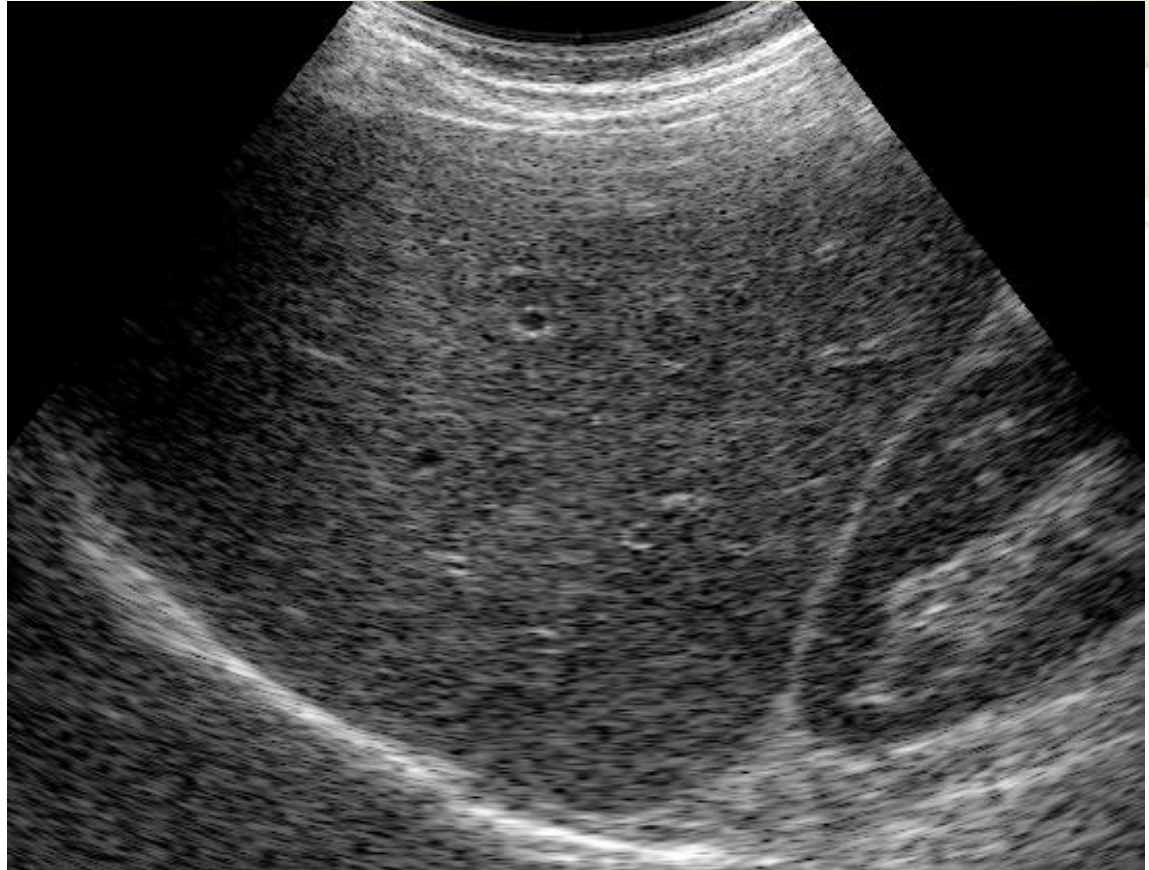


- Visual
- Safe for long-term use
- Requires an expert to interpret
- Passive
- Lots of unused information
- Huge unrealized potential

Anyone know
what this is and
what it means?

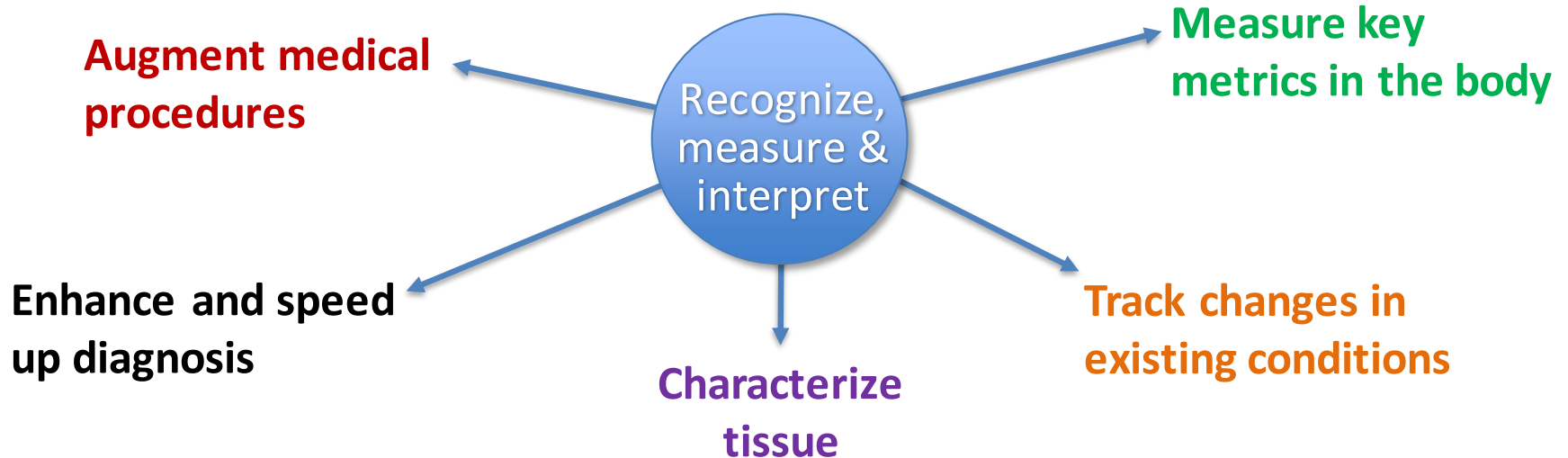


Or this?



What We Really Want From Ultrasound...

Rather than displaying vague grey images, we need the ability to collect and use data in real time:





Cephasonics Ultrasound
Solutions

Let's Imagine a Future of Data-Driven Ultrasound

Ultrasound Augmenting a Surgical Procedure



What if ultrasound systems could assist a surgeon by identifying, locating and measuring specific structures at and around the point of surgery.

Ultrasound Measuring And Tracking Disease Status



What if an ultrasound system could quickly track and measure the status of a patient's condition instantly in the doctors office, an outpatient clinic or even at home.

Ultrasound For Immediate Action in the ICR/ER



What if an ultrasound system could be used to assist in emergency & trauma situations to assess the critical condition of a patient.

We Can't Get There From Here...

(without changing how we approach the problem)

Today:

- We dumb down the data to create an image
- Lots of usable information gets thrown away
- Can't process all the data in real time
- Too hard to use – experts required
- Can't recognize, measure or interpret what it sees

Tomorrow:

#1 – Focus on the Data

Think of ultrasound not as just imaging,
but as data collection and analysis!

Data-driven Ultrasound

Tomorrow:

#1 – Focus on the Data

Everyone talks about AI and ultrasound but, AI is only as good as the data we can collect and use!

Tomorrow:

#2 – Do It In Real Time

Data is only good if you can get it to where
you need it!

Tomorrow:

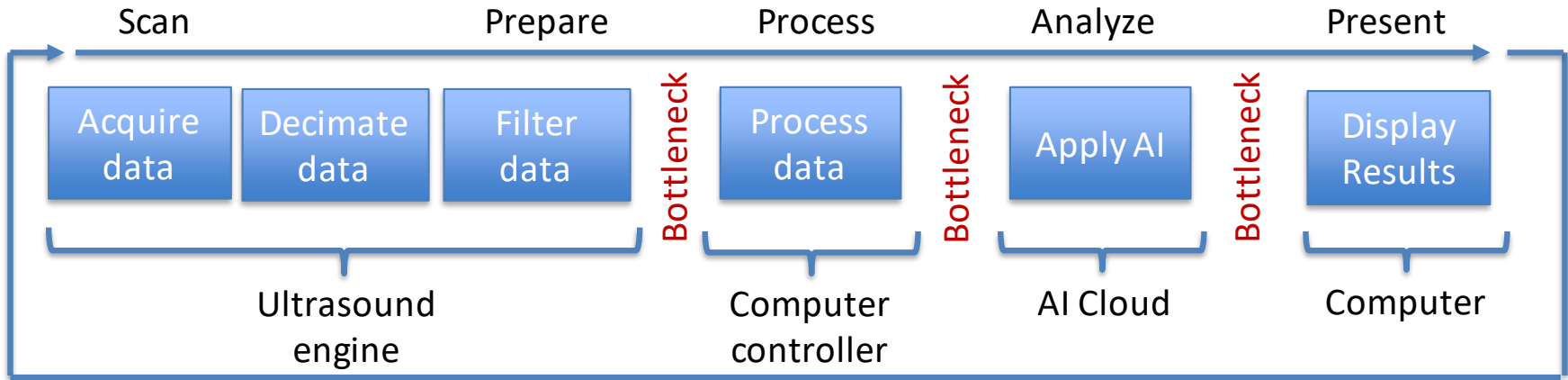
#3 – Move the math closer to the source

A Different Architectural Model

- Do the processing in the ultrasound engine
- Custom designed FPGAs
- Integrate Xavier directly in the data stream
- Dynamically load software into FPGAs and Xavier
- Client-server model for the software
- Move AI processing to Xavier in the engine

Moving to the Source

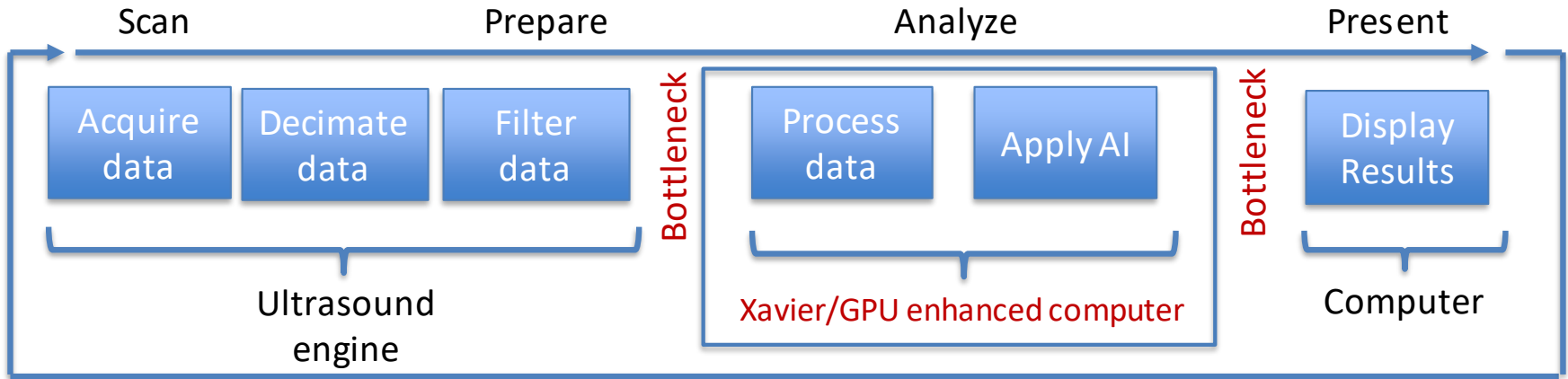
The traditional model – we have to limit the amount of data we can work with



Adjust and rescan based on results. Then process again

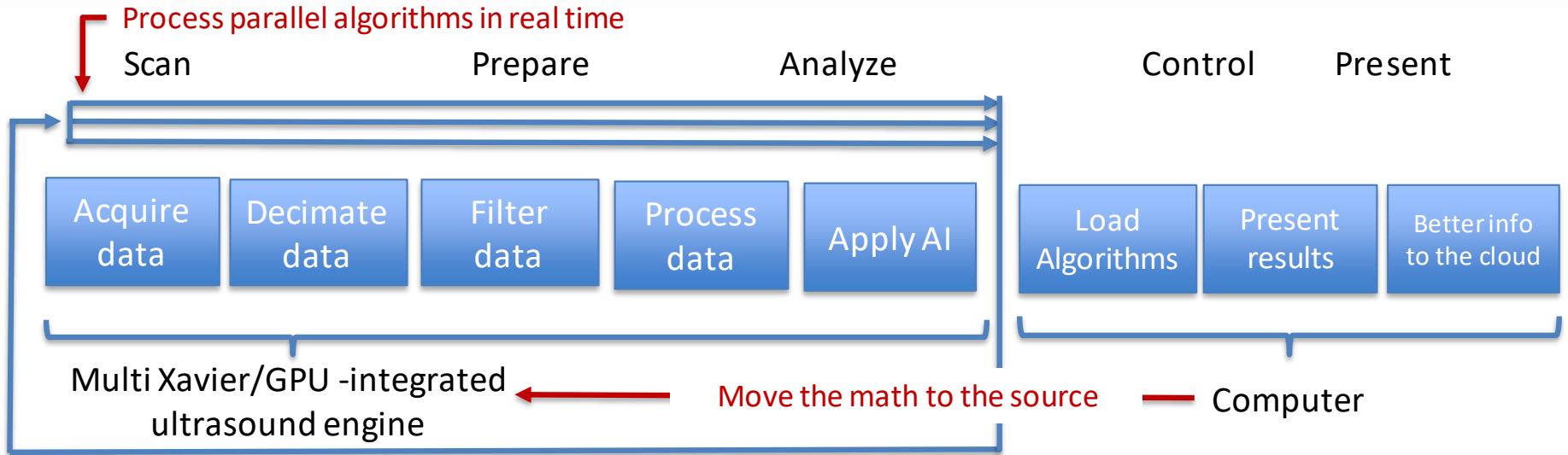
Moving to the Source

First step – use Xavier to augment processing data and building AI models on computer controller

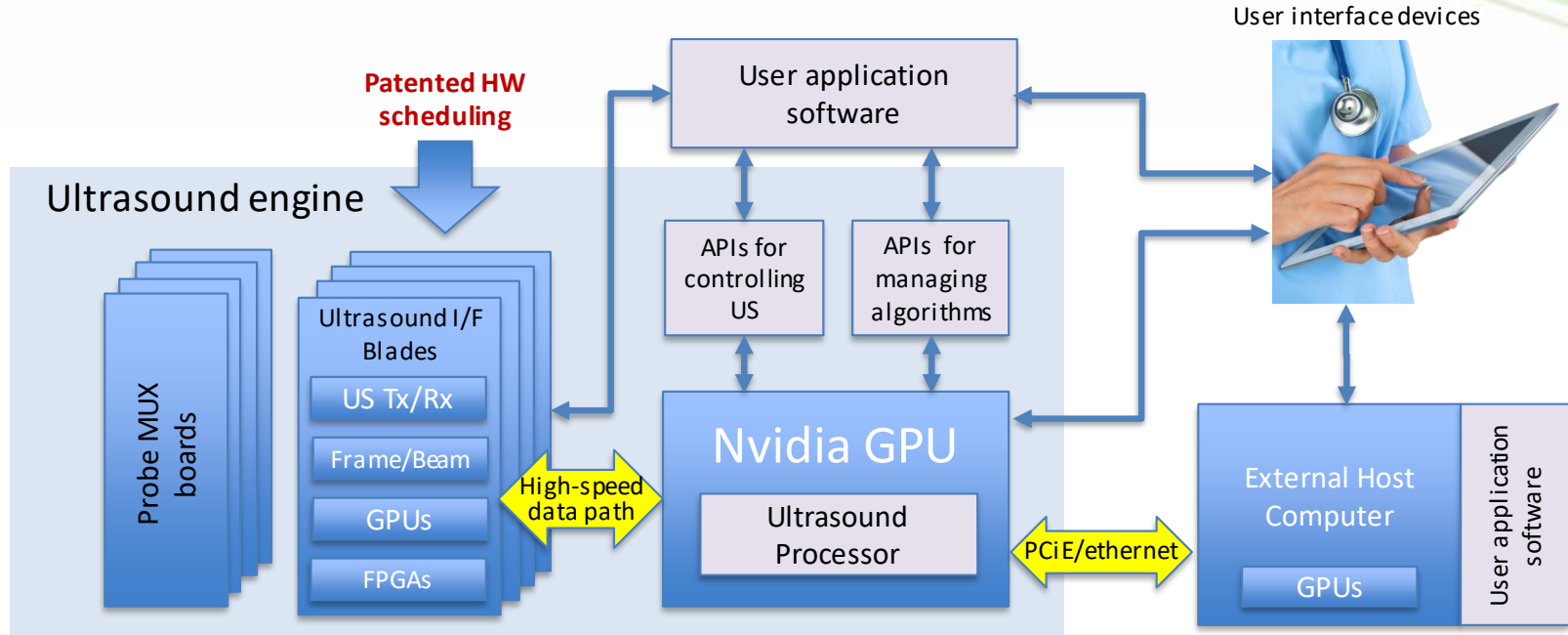


Moving to the Source

The future model – process more data at the source & run parallel algorithms



Next Generation Architectural Approach



Conclusion

An Xavier-powered ultrasound architecture will usher in a new era of ultrasound capabilities and applications in healthcare.

This will allow us to:

- Focus on data and information in **real time**
- **Democratize** ultrasound healthcare products
- Build **smarter** AI-powered systems to recognize, interpret and measure
- Move from a passive imaging to an **active** tool in healthcare
- Help companies build **revolutionary** new ultrasound products



**Cephasonics Ultrasound
Solutions**

Building Smarter Ultrasound

www.cephasonics.com