

## **Overview of recent technology developments in CT**

Jiang Hsieh, Ph.D.

Cone Beam CT (CBCT) is one of the most recent technical advancements in x-ray computed tomography. The state-of-the-art 64-slice scanners provide isotropic sub-millimeter spatial resolution, significantly improved dose efficiency, large volumetric coverage, and markedly improved temporal resolution. These capabilities open doors to new clinical applications.

This presentation provides an overview of the recent technical advancements in CBCT. The discussion first covers technical challenges that face CBCT, such as detector complexity, electrical and mechanical design, image reconstruction algorithms, dose, and information management.

The second part discusses some of the recent developments in CBCT. These include the advanced dose-reduction techniques, the dual-source CT scanner, more advanced reconstruction algorithms that break the traditional noise vs. dose tradeoffs, larger volume coverage, and dual-energy CT for material decomposition and presentation. If the past 10 years of CT development can be characterized by the “slice-war”, new technology developments are pointing to different directions.

### **Learning Objective:**

1. Overview of the recent technology developments in CBCT.
2. Understand major technical challenges in CBCT development.
3. Explore future directions in CBCT technology.