



Project

Self-Driving Cars

Hardware and Software Tools:

- Machine Learning
- Neural Networks
- Deep Learning
- Neural Networks with Deep Learning
- LIDAR System
- GPS Arrays
- Sensors

Curricular Requirements

- SC.912.CS-CS.1.5 - Represent and understand natural phenomena using modeling and simulation.
- SC.35.CS-CS.2.2 - Describe how computational thinking can be used to solve real life issues in science and engineering.
- ITEEA S3 - Students will develop an understanding of the relationship among technologies and the connections between technology and other fields of study.
- ITEEA S10 - Students will develop an understanding of the role of troubleshooting, research and development, invention and innovation, and experimentation in problem solving
- NGSS Engineering HS-ETS1 Use a computer simulation to model the impact of proposed solutions to a complex real-world problem with numerous criteria and constraints on interactions within and between systems relevant to the problem.

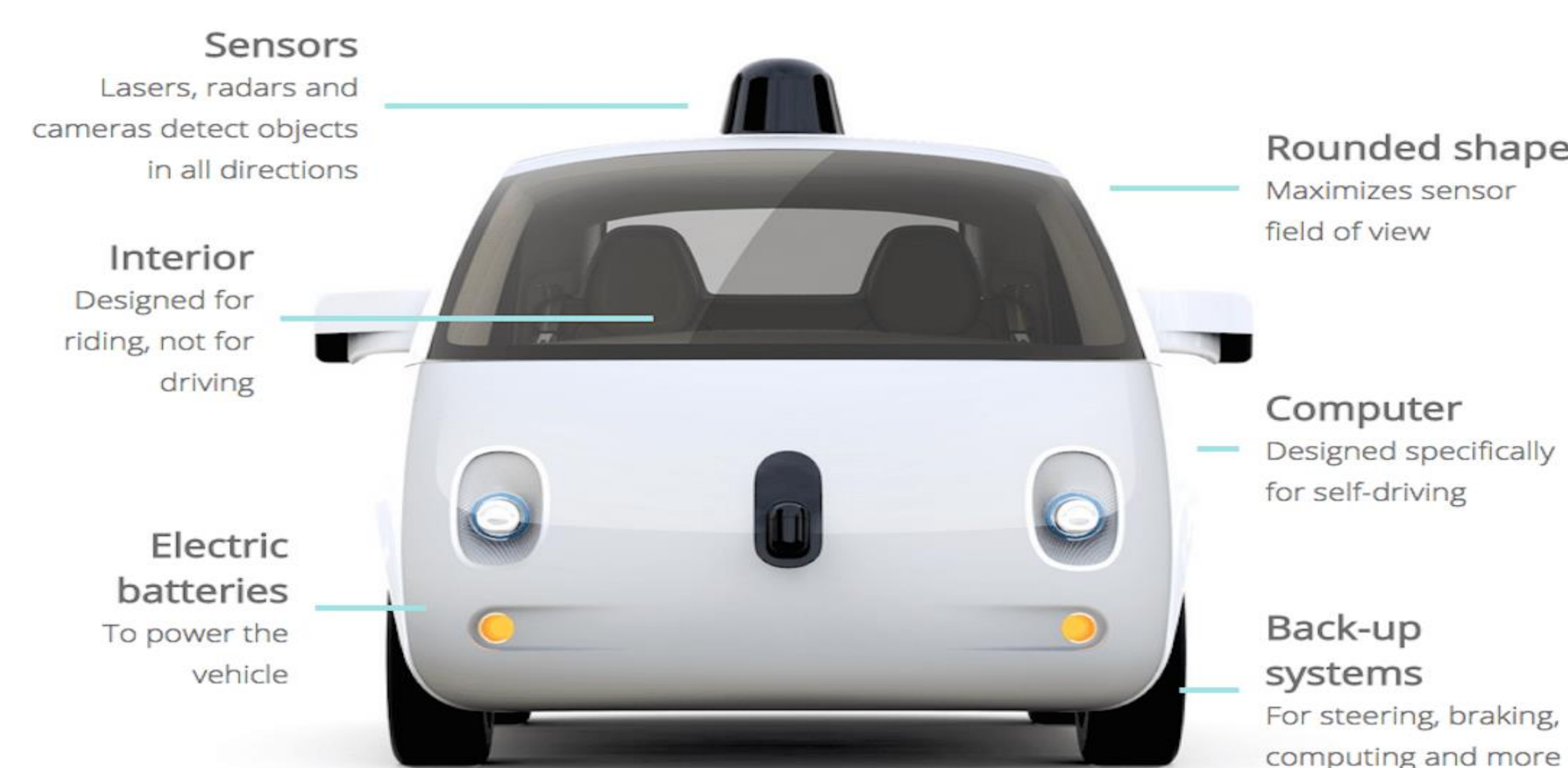
Project Overview

This project is to heighten the students awareness of the futuristic research conducted at the collegiate level. They will be encouraged to think outside the box to solve some of the problems currently being worked on to make self-driving cars safe for all. This will be accomplished through research, discussions, and coding arrays to get a concept of data manipulation. This project will also reinforce the concepts of being object-oriented in huge projects and coming together through collaboration.

Works Cited

Business Insider (June 14, 2016). Retrieved from <https://www.businessinsider.com/report-10-million-self-driving-cars-will-be-on-the-road-by-2020-2015-5-6>
 Google Images...Retrieved from https://c1.staticflickr.com/6/5777/21798665468_be99997b20_b.jpg
 Google Images...Retrieved from https://c1.staticflickr.com/6/5777/21798665468_be99997b20_b.jpg
 Google Images...Retrieved from https://encrypted-tbn0.gstatic.com/images?q=tbn:ANd9GcThgkE7IH9rYzmvwyMUz_J_p8ZhoxkFe6R6K9f8ef0KzLGakZ2
 Google Images...Retrieved from <https://encrypted-tbn0.gstatic.com/images?q=tbn:ANd9GcQLcc9rvS5AeuZUQYsZKWPNU5rMKCougRIVAlsqbZPOyLbva4H>

Self-Driving Car



Current Safety Needs!

Better Maps	Better Software	Better Sensors	Better Communication	Better Robots

Main Self-Driving Car Activity

Python Code Manipulation

- Slowing the car will be demonstrated
- Change Code to Speed the car up
- Analyze Data to detect anomalies
- Change the code to be object-oriented

Summary

- With all of the research coming together, the cost is still outside the range of the average driver. With the Lidar System, sensors, radars, and GPS Array system, the current cost is \$320,000
- Using all of this information and using just a smart phone, UCF was able to drive a car without a human driver. This brings the cost down to the car plus \$500.00 + the car.

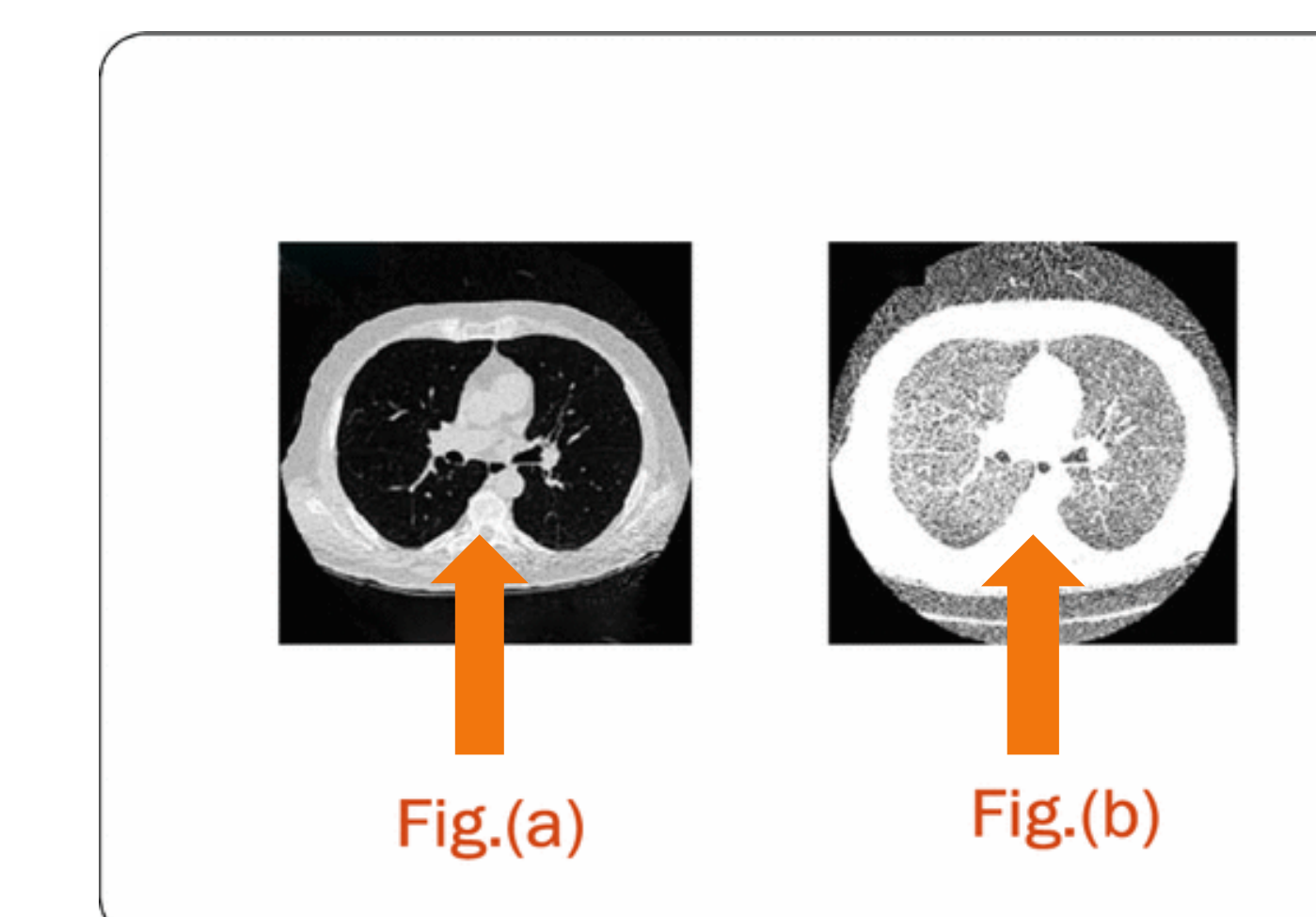
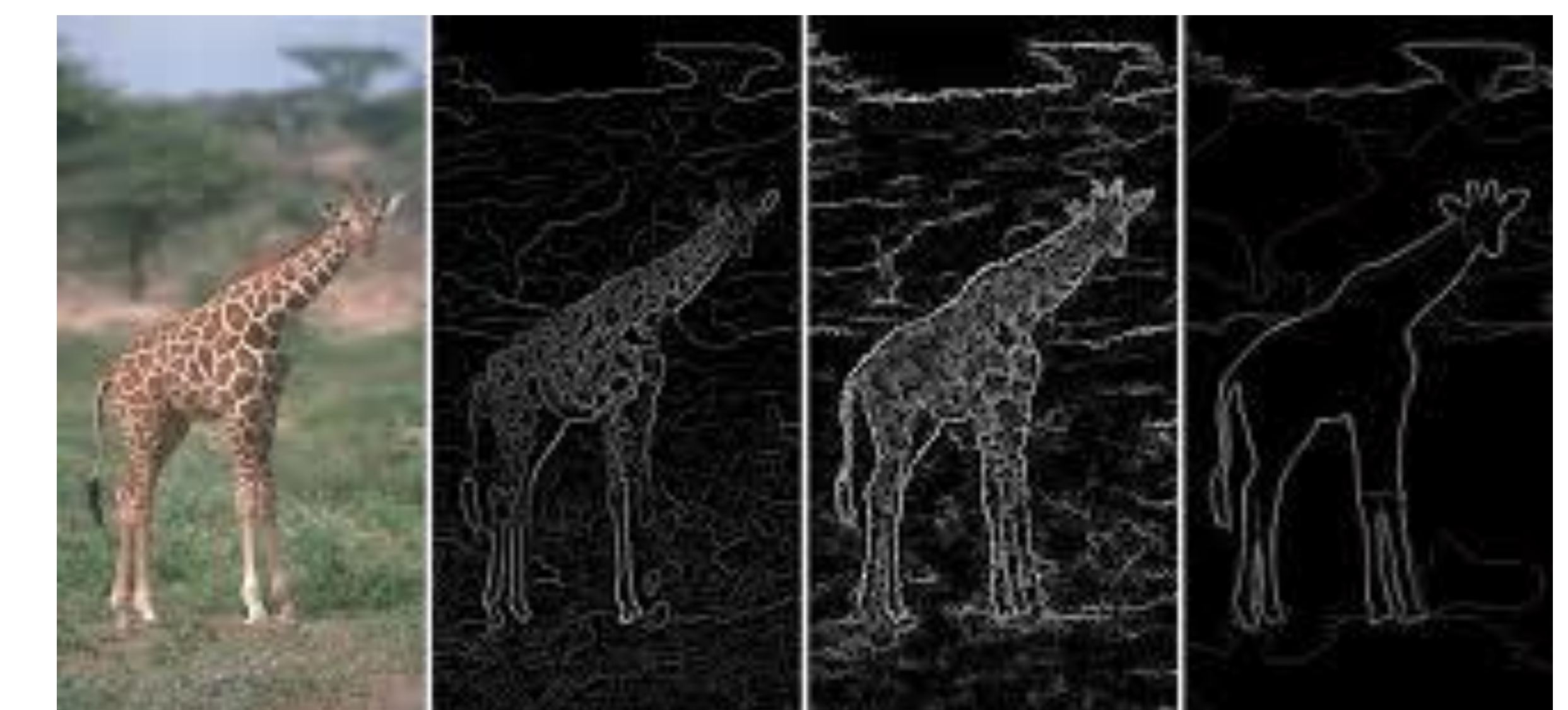
Student Activities

- Lung Cancer Presentation
- Pix Lab Project
- Edge Detection Project
- Pre-Assessment Research
- PowerPoint Introduction of Self-Driving Car (Videos)
- Discussion on machine learning/neural networks/deep learning
- Manipulation of Python Self-Driving Car Code
- Coding arrays pulling in large amounts of data using an object-oriented design
- Post-Assessment
- Quizzes and Tests on Arrays and Object-Oriented design

Related Activity

Lung Cancer Detection

Edge Detection



Use edge detection to get the "gist" (gradient-information stitching) of the surrounding features in reference to the cancer node.