Problem Statement
Maintaining a healthy lifestyle through conscious eating is essential, but keeping track of one’s eating habits can be challenging. To overcome this challenge, we have designed a smart spoon that utilizes sensor integration and computer vision models to monitor and analyze a user’s eating habits.

Background
Spoonified address problems with calorie tracking by integrating calorie tracking technology in the utensils that you use for eating daily - such as a spoon. A smart utensil equipped with integrated sensors identifies the type of food you are consuming and measures the mass of each bite. Employing a scientific, macronutrient-focused approach, it calculates the total caloric intake for each meal, offering valuable insights into your dietary habits. Also, based on the sensors Spoonified will be able to track how fast you are eating - which is an integral part of healthy eating habits and is an area that none of the methods described above focus on or can track.

Objective
The purpose of this device is to develop a smart spoon with advanced features to accurately measure, track, and report a user's eating habits. The device will monitor the frequency and mass of bites within a meal, offering users insights to make informed judgments about their eating patterns.

Architecture of Final Design
Our hardware design philosophy targeted a natural, comfortable enclosure that feels not too different from a regular spoon. We prioritized user’s end experience for the design of the spoon such as placement of the LED, Button, and Camera to not interrupt the flow of a meal. Our user experience approach led us to design a pogo-pin equipped dock which serves as a charging station, making the use cycle familiar and intuitive. This would allow repetitive use without having the user worry about replacing batteries.

Enclosure & UX Design
Our software development communicates back and forth with the Smart Utensil via Bluetooth LE. The app was developed using Android Studio, using native Android Bluetooth libraries. The app communicates with an existing CV ML API and relays image data, receiving recognized food confidence intervals in JSON format.

Software
An application was developed that communicates back and forth with the Smart Utensil via Bluetooth LE. The app was developed using Android Studio, using native Android Bluetooth libraries. The app communicates with an existing CV ML API and relays image data, receiving recognized food confidence intervals in JSON format.

Ethics
Ensuring that the device provides precise and reliable data is essential for maintaining user trust and delivering meaningful insight. Special software design emphasis will be placed on data privacy including protecting client's sensitive health data. The platform will only allow authorized individuals like dietitians, nutritionists, to see a user’s PHI.