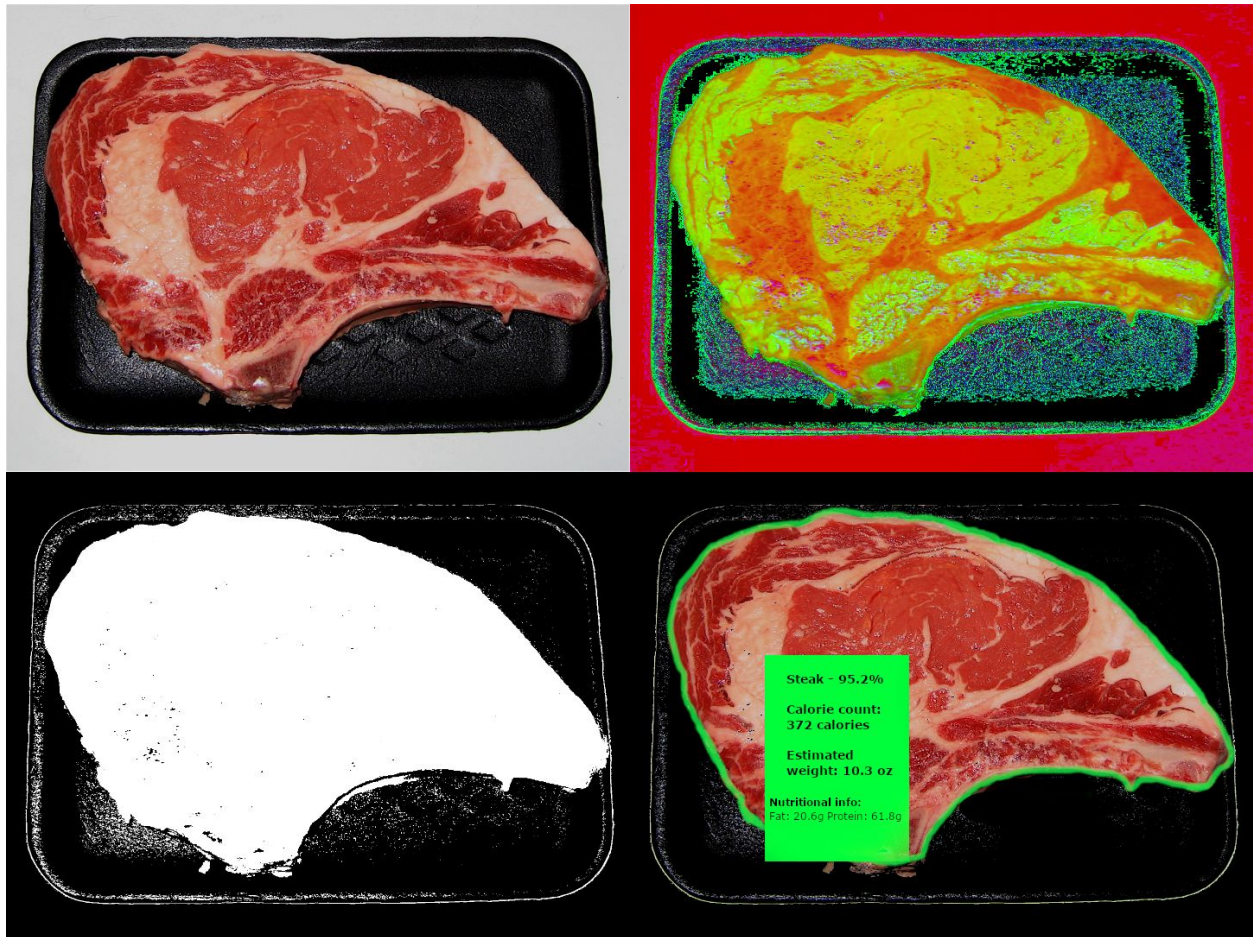


## **CLOAK-D: Calorie Lowering with OAK-D**



## **Saran Bros.**

### **Team members:**

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Collectively, we have worked on a number of artificial intelligence-related projects, both professionally and recreationally:

- Building behavioral representations in *D. Melanogaster* with CNNs ([Talk: Representing Fly Behavior with Recurrent Neural Networks](#))
- Developed a computational model to flag acute kidney injury for physician-assisted prognosis ([Welcome to the akiFlagger documentation! — akiFlagger 0.0.3 documentation](#))
- Created computational models to evaluate ecosystem services

- Winners of the CONRAD Spirit of Innovation Challenge 2018-19 ([Clark High School students win big for invention that curbs vaping](#))
- Designed computer vision tracking software to detect bacterial motility
- Data scientist for Nair lab at Harvard Kennedy School of Public Policy
- Postgraduate associate for Wilson lab at Yale School of Medicine
- Studying computational neuroscience at Vanderbilt University

As a team, we pioneered a project called VapeMate. VapeMate is an app that helps users temper their vaping addiction by displaying the amount they've vaped in a day and their progress over time. Through building this product, we've learned how to effectively integrate behavioral sciences and technology through designing a user interface that helps influence and keep users committed.

### **Problem Statement:**

As the world has taken strides towards increasing nutritional awareness, calorie-counting has become increasingly popular as a means for tracking nutritional information. From mitigating the obesity pandemic to ensuring the elderly meet their nutritional needs, it's clear to see that tracking food can offer crucial health benefits for a variety of people. However, the quality of current calorie-counting apps on the market is far behind the standards of today's technology. Users search for food items through limited, non-unique databases, often yielding inaccurate and conflicting results which further derail users from their goals. However, an app integrated with the OAK-D device would go far beyond the simplistic approach the industry has taken towards dieting.

A holistic approach melding together the OAK-D powerhouse with the easy-to-use interface of an app would allow for many benefits. Rather than having users guess from a long list of similar-looking and sounding foods, the app would simply require the user to take a picture of their meal. By utilizing a pretrained machine learning model, a much more richer description of the nutritional make-up of the food item could be realized. Additionally, by harnessing the spatial depth perception of the OAK-D, 3D information about the food could be integrated into the model's estimate of the size and weight of the food, thereby greatly increasing accuracy of prediction.

Large repositories of per-gram nutritional information and food-recognition CNNs are freely open-sourced and available online. To begin with, the app would integrate these services to generate predictions for nutritional information. We anticipate building a pipeline to integrate new information as more and more users join to build more robust models. From our work on VapeMate, we know the best way to positively influence behavior is through creating a clean, enjoyable experience while iteratively adapting insights from technology to committed users. OAK-D provides for a much slicker solution compared to the current market, it would drastically reduce the amount of human effort required, and when integrated with the app will ultimately provide a much clearer path for people to conquer their dietary goals.