AI powered Fridge Assistant:

We aim to innovate the modern day refrigerators by enhancing the current technology with AI and IOT in order to achieve added functionalities. Our goal is to add user-friendly features to the existing refrigerators with a few modifications in order to provide more ease and flexibility to the user.

Technologies being used(so far):

- For Collection of data we used beautiful soap to scrap through three major recipe websites.

- The data is being studied using pandas in python. The algorithm will be based on tokenization of ingredients. The sample data is given below.

	title	ingredients	instructions	picture_link
0	Slow Cooker Chicken and Dumplings	[4 skinless, boneless chicken breast halves AD...	Place the chicken, butter, soup, and onion in ...	55lznCYBbs2mT8BTx6BTkLhynGHzM.S
1	Awesome Slow Cooker Pot Roast	[2 (10.75 ounce) cans condensed cream of mushr...	In a slow cooker, mix cream of mushroom soup, ...	QyrvGdGNMBA2IDdciY0FjKu.77MM0Oe
2	Brown Sugar Meatloaf	[1/2 cup packed brown sugar ADVERTISEMENT, 1/2...	Preheat oven to 350 degrees F (175 degrees C)....	LVW1DI0vtICrpAhNSEQysE9i/7rJG56
3	Best Chocolate Chip Cookies	[1 cup butter, softened ADVERTISEMENT, 1 cup w...	Preheat oven to 350 degrees F (175 degrees C)....	0SO5kdWOV94j6EfAVwMMYRM3yNN8eRi
4	Homemade Mac and Cheese Casserole	[8 ounces whole wheat rotini pasta ADVERTISEME...	Preheat oven to 350 degrees F. Line a 2-quart ...	YCnbhplMgiraW4rUXcybgSEZinSgljm
...	...	...	...	...
125159	Summer Corn Salad	[4 ears fresh corn, 2 heads Belgian endive, 2 ...	Watch how to make this recipe.\nPreheat a gril...	G9XPV1I0nULIbwS76f..0Alq2Dsfl3u
125160	Zucchini Stuffed Tomatoes	[4 large plum tomatoes, Salt and sugar, 1 1/2 ...	Preheat the broiler. Cut the tomatoes in 1/2 c...	nA7V5iQqaFclEQQ0/MKqVdUioieXjPu
125161	Pepper Pasta Quick Cook	[3 tablespoons olive oil, 2 tablespoons unsalt...	Heat the oil and butter in a large skillet ove...	None
125162	Chocolate Cake with Armagnac Ice Cream	[8 ounces butter, 8 ounces bittersweet chocola...	Preheat oven to 350 degrees. On the top half o...	None
125163	Crabby Bisque	[3 (10.5-ounce) cans restaurant-style condense...	Watch how to make this recipe.\nIn a medium sa...	CTfEq6AD/JpKf4ys4awoYB4hpdzgXqm

The data collected has over 125164 recipes currently and will be cleaned for any kind of irregularities present.

- For Developing the app, React native is being used and a sample of the prototype of UI/UX has been attached as a pdf below.

- We will retrieve the ingredients present inside the fridge using computer vision and deep learning assisted algorithms, possibly YOLO, the list will be then sent to a server where we will predict various recipes that can be made out of the list and list them accordingly on the mobile app.

- For alerting of the quantity we can go in two routes, one being getting the data from user on how long any equipment can hold and then recording and inferring in regular time intervals, or making a generalized dataset for various item, example: Milk expires in 1 day.

Features for smart fridge :

- Identification and tracking of food and grocery items present in the fridge along with the duration for which they are stored using object detection, OCR, proximity sensors.

- Sending Alerts on a smartphone app in case frequently stored items are about to get over.

- Send an alert if a particular item is present for an unusually long period. Examples: curd stored over 2 days.

- Visually detect rotten food items, especially vegetables or fruits and alert user through

- Suggest a recipe to the user depending upon the availability of the food items in the fridge

- Voice control (future scope)

- Order the food items automatically with blockchain if that option is enabled by the user in the app. (Future scope)

Challenges to tackle:

- Not all containers are transparent and there can be a problem for flour(just one out of few examples where rice flour corn flour almost look same) unless people are willing to use dedicated containers with distinct colors for each item.

- The moment a fridge is closed, light goes off which will create a problem for visual detection. For this, we might have to take images during the time, the fridge is opened momentarily by the user and then use it as an input during execution.

- ML/DL algorithms seem to require heavy processing so there might arise a need to be deploy these models somewhere remotely off the RPI.

- We will have to think of a suitable design for the fridge itself because placement of components seems challenging and crucial. Also we will need multiple cameras

- Not all food items are stored inside a refrigerator so in the algorithm which will suggest the recipes, we'll require some considerations pertaining to the items that are stored separately.

Technologies :

AIML, IOT, Deep Learning, Data analytics, OpenCV, WEB scrapping, App development.