SmrtFridge: IoT-based, User Interaction-Driven Food Item & Quantity Sensing

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## Introduction

- An internet connected fridge to track the identity and quantity
- Tracking using Embedded Systems (IR and optical camera sensors)
- Notify the users about the items needs to be purchased
- Interaction Driven Capture
- Residual Quality Estimation

## Motivation

- Studies on food wastage : 48% due to expired items
- Out of which for 36.5% cases : items were untended

# Existing Implementation Limitations

- Use of Convolutional neural network (CNN) to identify the content level
  inside the transparent containers and glasses
- CNN is trained with various colored plastic/glass bottles, a purely visual sensing approach does not work for non-transparent containers,

# Design Goals and Workflow

- Real life scenario
- Natural interaction between user and fridge
- Identification of Product Labels
- Episode Segmentation
- Item Image Extraction
- Image-based Food Item Recognition
- Residual Food Quantity Estimation

# Prototype

- Visible Light Camera sensor
- IR/Thermal Camera sensor
- Door Contact sensor
- Object Recognition DNN

## Limitations

- No Product Expiration Check
- No Support for Unlabeled Food Items
- Approximate Support for Quantity Estimation
- No Tracking of Specific Item Instances
- Privacy



# Thank You..!