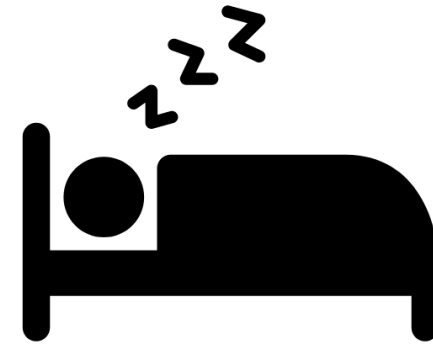


Individual Dietary Monitoring with Technology

Samantha Kleinberg
Stevens Institute of Technology

I have NO financial
disclosure or conflicts
of interests to disclose.



3. What type of milk did you most often use?
Select one only

Full cream/whole	☐	Semi-skimmed	☐
Skimmed	☐	Channel Islands, gold	☐
Dried milk	☐	Soya	☐
Other, specify		None	☐

4. How much milk did you drink each day, including milk with tea, coffee, cereals etc?

None	☐	Three quarters of a pint	☐
Quarter of a pint	☐	One pint	☐
Half a pint	☐	More than one pint	☐

5. Did you usually eat breakfast cereal (excluding porridge and Ready Brek mentioned earlier)?
 Yes ☐ No ☐

If **YES**, which brand and type of breakfast cereal, including muesli, did you usually eat?
List the one or two types most often used

Brand e.g. Kellogg's	Type e.g. cornflakes

6. What kind of fat did you most often use for frying, roasting, grilling etc?
Select one only

Butter	☐	Solid vegetable fat	☐
Lard/dripping	☐	Margarine	☐
Vegetable oil	☐	None	☐

If you used vegetable oil, please give type eg. corn, sunflower

7. What kind of fat did you most often use for baking cakes etc?
Select one only

Butter	☐	Solid vegetable fat	☐
Lard/dripping	☐	Margarine	☐
Vegetable oil	☐	None	☐

If you used margarine, please give name or type eg. Flora, Stork

10. What did you do with the visible fat on your meat?

Ate most of the fat	☐	Ate as little as possible	☐
Ate some of the fat	☐	Did not eat meat	☐

Can we track meals the
way we track steps?

Amft et al. 2005, 2009

Amft et al. 2009

Päßler & Wolf-Joachim Fischer 2011

Cheng et al. 2013

Thomaz et al. 2013

Fontana et al. 2014, 2015

Dong et al. 2014

Rahman et al. 2014

Thomaz et al. 2015

Bedri et al. 2015

When

Rahman et al. 2015

Ramos-Garcia et al. 2015

Zhang et al. 2016

Merck et al. 2016

Mirtchouk et al. 2017

Chun et al. 2018

Bi et al. 2018

Audio, Motion, Image, Multimodal

When

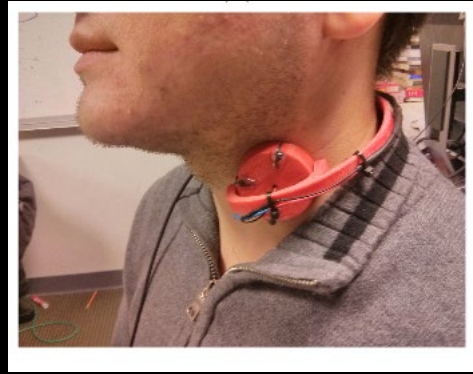
What

Audio

all in lab



Yatani & Truong 2012
2 foods



Rahman et al. 2014
4 foods



Amft & Tröster 2009
19 foods

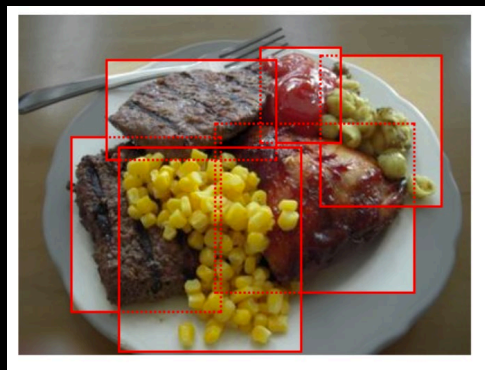
Motion

wrist
calorie estimate

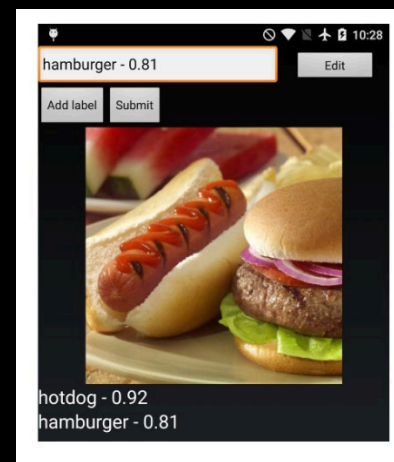


Shen et al. 2016

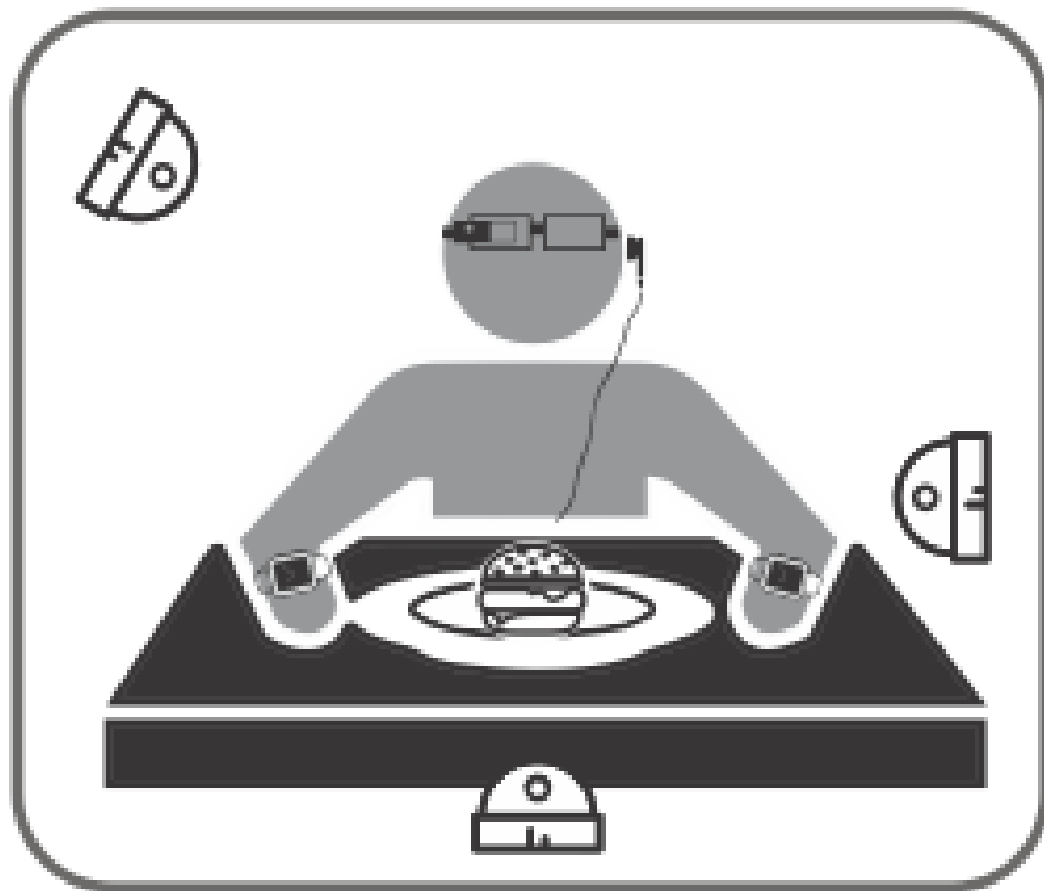
Images



Noronha et al. 2011
Crowdworkers



Myers et al. 2015
Deep learning + menu



Lab



Free living

Accuracy: food type

Lab: 83.3% Mirtchouk et al. Ubicomp 2016

Training on lab+FL Mirtchouk et al. MLHC 2019

Free living: 83.1%

Lab: 88.0%

When

What

Why

How



11:00am
Chicken
Salad
Rice

Why eat now?

Why eat these foods?

Will they finish the meal?

Who are they eating with?

How are they feeling?



watermelon



soup



pasta, shrimp



beef, rice



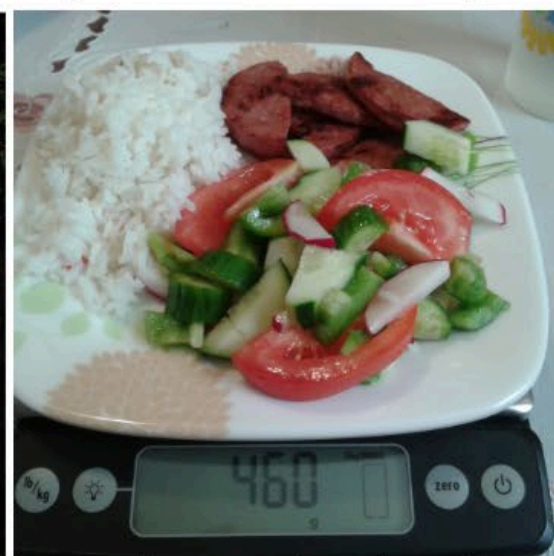
fries



salad



pizza



pork, salad, rice



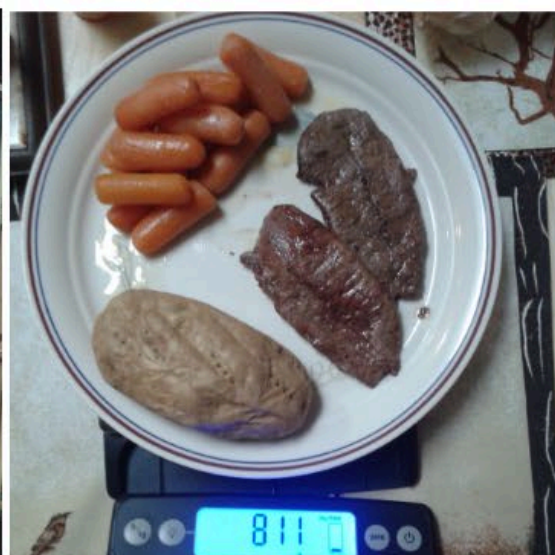
banana



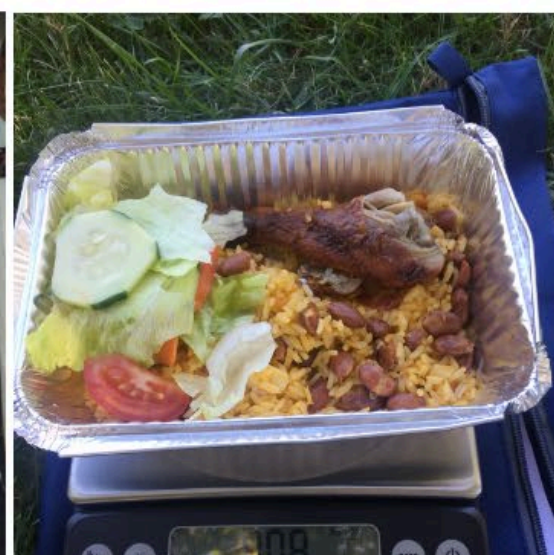
ice cream



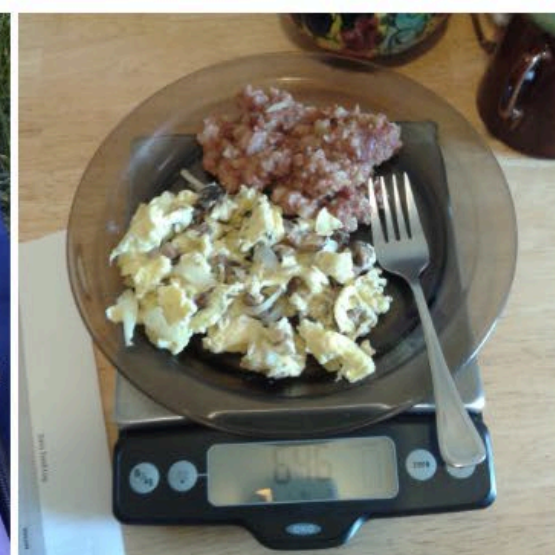
cookies



steak, potato,
carrot



chicken, salad,
rice



egg, hash



salad

Generalizability





Health
+AILab

Funded by NLM/NIH, NSF, and JSMF