# ShopTalk:
Independent Blind Shopping = Verbal Route Directions + Bar Code Scans
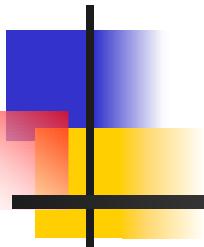
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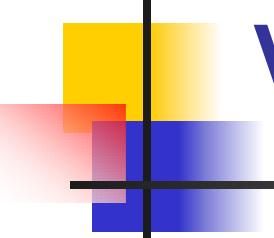
Grocery Shopping for the Visually Impaired

- Grocery shopping is a difficult task
  - Average supermarket has 45,000 products
- Current options
  - At Store
    - Another person must be available
  - Websites
    - Not all websites service local area
    - Delivery is not immediate

ShopTalk

- Verbal instructions guide user
- User Input
  - Numeric keypad
  - Bar code scanner
- Off-the-shelf (OTS) components
- Does not require change to store environment

Keypad

CPU

Backpack
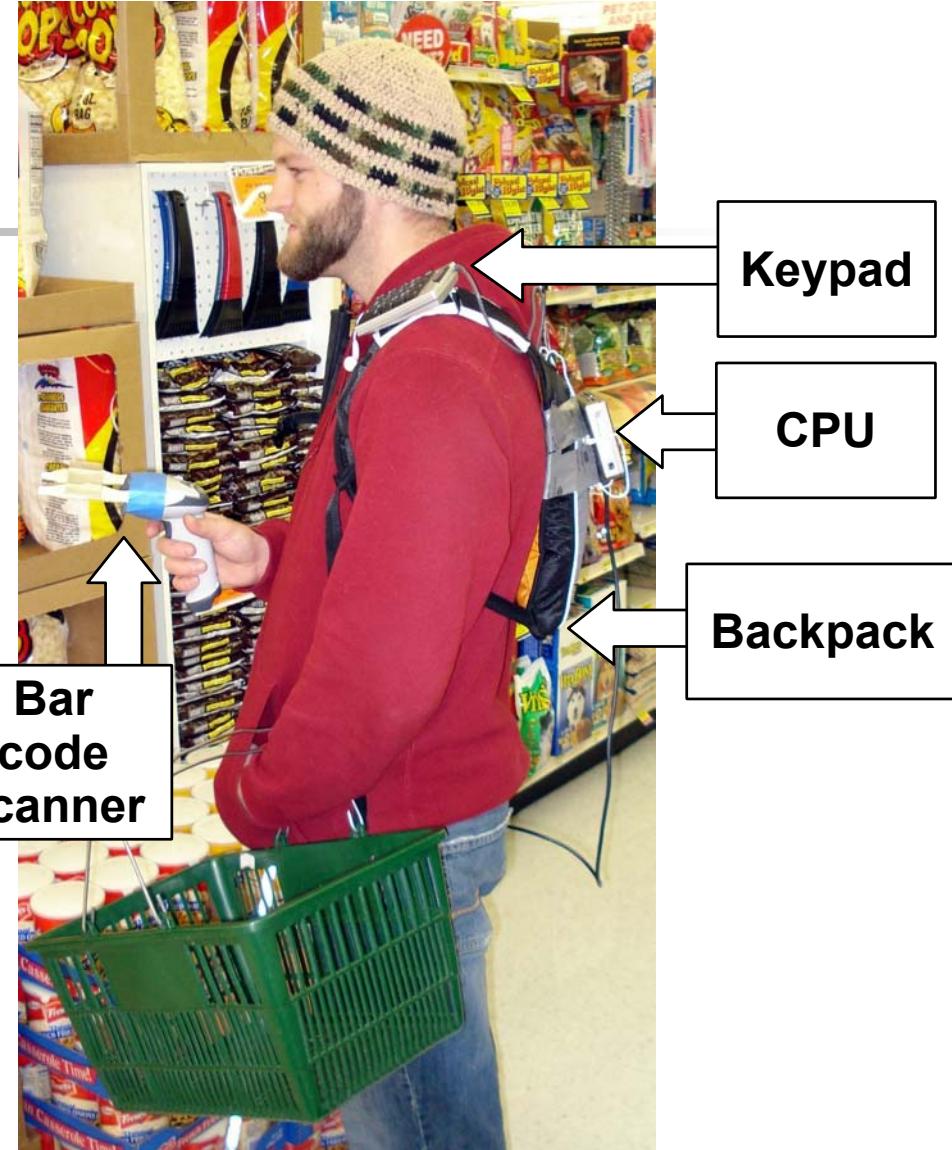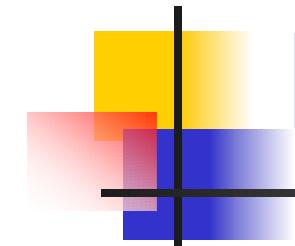
Bar code scanner

Macro-Navigation

- Topological Map
  - Store entrance
  - Entrances to aisles
  - Cashier lane
- ShopTalk provides verbal directions at user's request
- User uses own navigation skills
- Scanning a bar code provides error correction
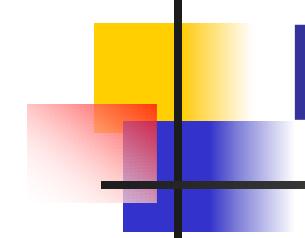
Product Search

- Database of products
- In general area of product, search for exact position of product on shelves
- Shopper uses bar code scanner
- System provides verbal instructions on where to scan next
- Whenever a bar code is scanned, system knows where user is

Modified Bar Code Scanner

Shelf lip

Extensions attached to scanner

OTS bar code scanner
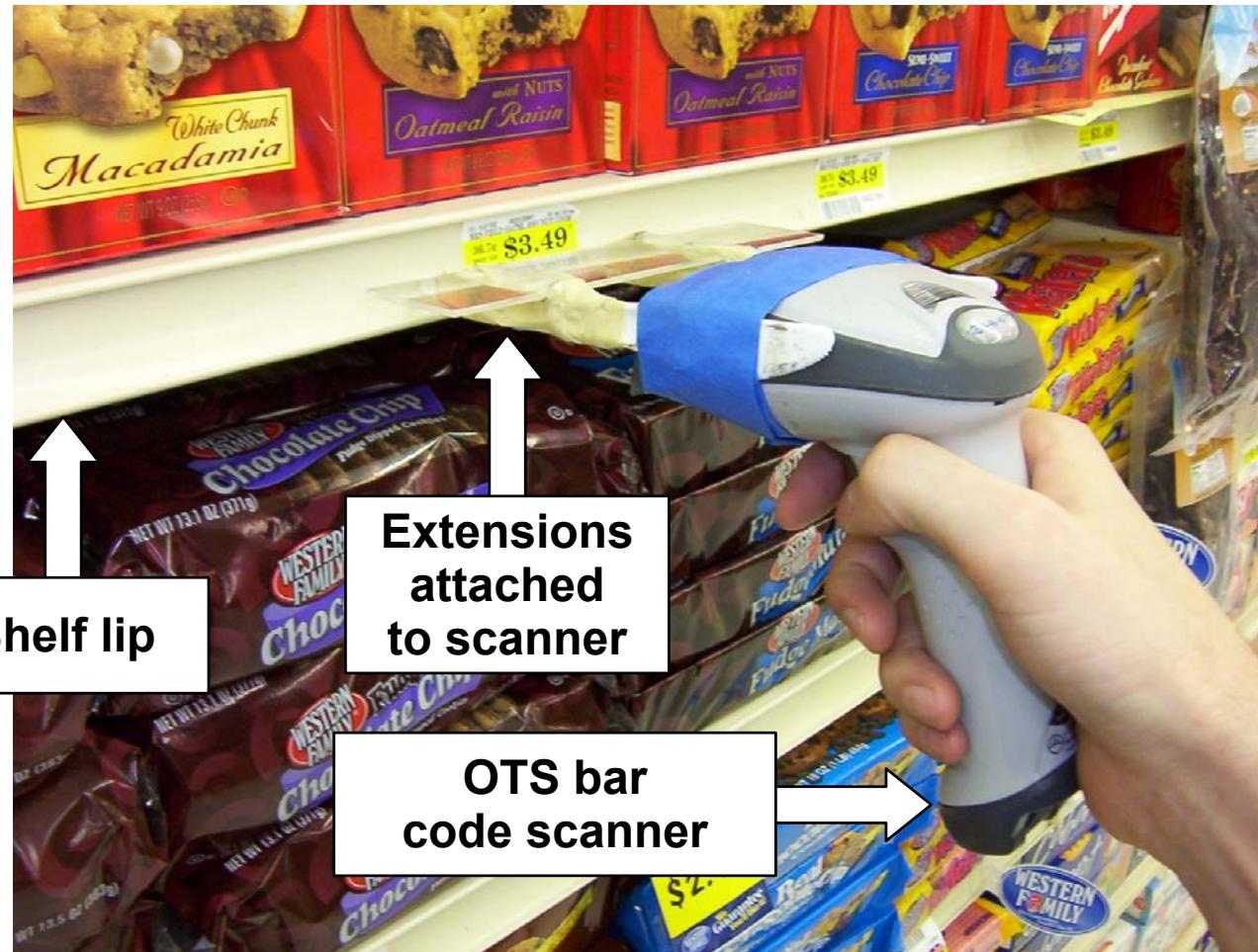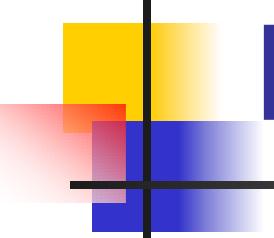
Describing Product Location

- Aisle
- Side of aisle
- Shelf section
- Shelf
- Product position
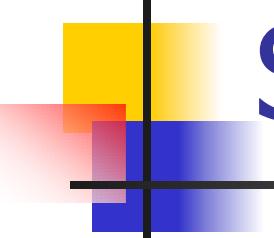
Single Participant Pilot Study

- 1,655 shelf bar codes in one aisle of Lee's Supermarket scanned

- 7 product sets
  - 3 products per product set

- 16 runs completed
  - At least one run for each product set

Results

Distance Walked and Time for each Run
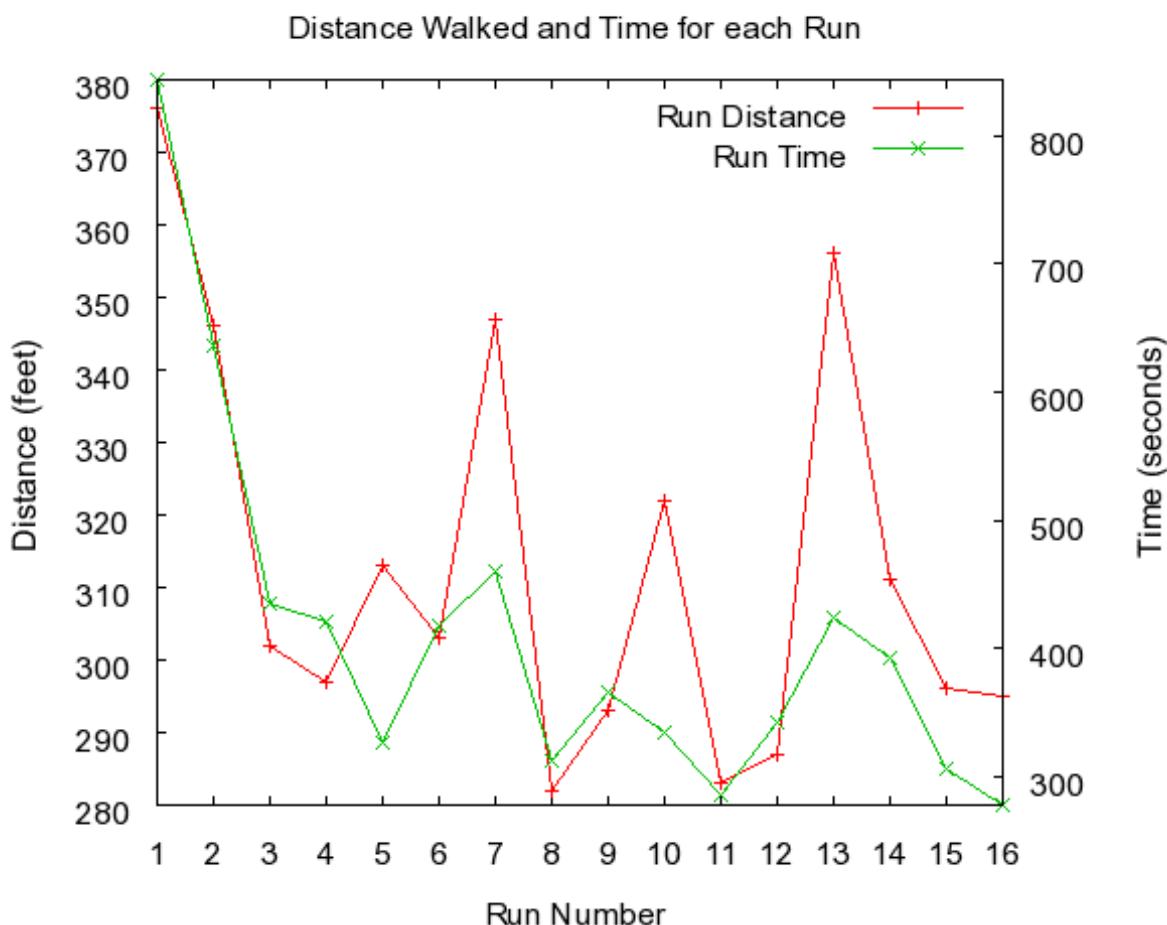
- All runs completed
- All products successfully found.
- Distance visually impaired participant compared favorably with sighted person walking same route.
- Average of 4.2 barcode scans to find individual product.

Video: Navigating from Aisle to Aisle

Video: Searching for a Product
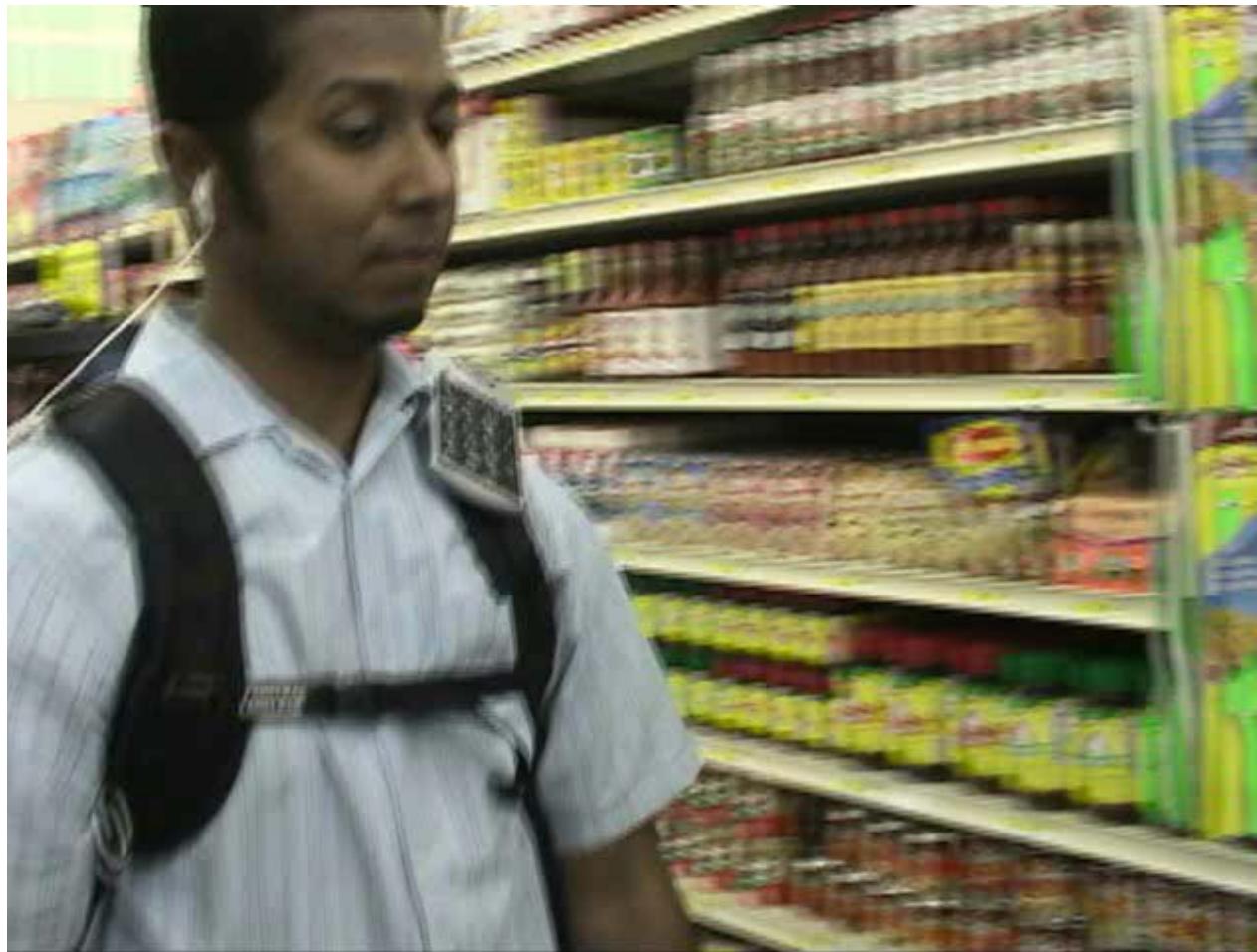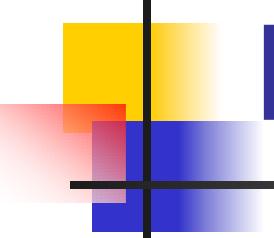
Future Work

- In grocery
  - Already scanned two more aisles
  - Test system with more users over more complex routes
- Test outdoor navigation using only verbal instruction