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
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

- 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