Items

1. Presentation evaluation forms
2. Mid-term reports - due in class Tuesday
3. Carpool drivers needed for tour of Gait & Motion Analysis Lab in Menlo Park – Thursday, February 23rd
4. Passenger signup list in class next Tuesday
Tuesday

Ray Grott, MA, ATP, RET
San Francisco State University

Practical and Appropriate Technology Solutions
Presentation Schedule

1. 4:15 - 4:25 RotaBrake
2. 4:25 - 4:35 Spin a Story
3. 4:35 - 4:45 Piano Pedal
4. 4:45 - 4:55 Accessible Eateries
5. 4:55 - 5:05 KinExpressions!
6. 5:05 - 5:15 Transfer-mations
7. 5:15 - 5:25 Friendly Cane
8. 5:25 - 5:35 Customize the Wheelchair
Wheelchair Brake

**ROTAbreak**: Tyler Haydell, Jai Sajnani, and Mark Murphy

**Project**: Explore designs for a low cost brake design for a manual wheelchair.
ROTAbake

ENGR 110: Perspectives on Assistive Technology, Winter 2011-2012

Team: Universal Braking Solutions (U.B.S)
Jai Sajnani, Mark “Leko” Murphy, Tyler Haydell
Abstract

• Our team is working to develop a universally adaptable wheelchair wheel package that addresses the following:
  – Creating an anti-rollback mechanism that can easily disengage
  – A new parking brake that can be easily activated and sustains consistent performance
  – Implement a retarding brake into wheelchairs
Statement of Problem

• Wheelchair brakes currently on the market are difficult to activate and sensitive to tire size and wear. Anti-rollback mechanisms can not be easily disengaged, and they are separate from the actual brake. Wheelchair users must use the friction between their hands and the handrim as a retarding brake – which beyond being extremely strenuous and tolling, doesn’t provide sufficient braking ability in normal or compromised situations.
Magnitude of Problem We are Addressing

- We are working primarily to create a parking brake that is independent of tire pressure and can be easily activated. Secondarily, we are attempting to develop an anti-rollback mechanism that can be easily activated. We are also working to lessen the force on the user’s hands required to brake the wheelchair.
Interviews

• **Marv Tuttle** – paraplegic; very active; tabs in handrim and lever brake damage hands; as tire wears brakes become less effective; always need hands on both rims; go through bike gloves in a week; wheels = costly; retarding brakes must be convenient

• **Ken** – quadriplegic; less hand function; exposed need for brake to not require much dexterity; again hand hits lever brake; wetness and dustiness make handrim slippery; had anti-rollback device that he didn’t really use – wasn’t convenient; chair must fit through doorways
Statement of Specific Need

• Brake that is easily activated and doesn’t depend upon status of tire.

• Anti-rollback mechanism that can be easily engaged/disengaged.

• Retarding brake that can be easily activated and doesn’t require releasing handrim
Existing solutions

• Commercially Available Designs
  1. Traditional Lever Brakes
  2. Disc Breaks
  3. “Magic Wheels” Gear Breaks
  4. Coaster Breaks
• Limitations of These Solutions
Brainstormed Ideas

• Handrim Device
  – Description: Rod-like device that comes out of fixed axle and would clamp onto handrim
  – Function: retarding brake; potentially a parking brake; could clean handrim
  – Logistics: Activated by bicycle brake type mechanism
  – Cons: Difficult to prototype, would require very sturdy metal that may add weight, activation with cables would be difficult
• **Wheel of fortune idea**
  
  – Description: if pushed forward, wheel would move forward, but if wheel is stationary, tabs would slow down wheel
  
  – Function: retarding brake; eliminate friction from hand when braking
  
  – Logistics: handrim and wheel would exist on different axles; gear-like mechanism would allow generate forward motion if pushed forward, but oppose it if stopped
  
  – Cons: would not allow for reverse; not a parking brake
Brainstormed Ideas

- **Push in Handrim**
  - Description: pushing inwards on handrims would activate brakes
  - Function: retarding brake, potentially parking brake
  - Logistics: would have to again make handrim semi-independent of wheel (forward motion would correspond to wheel, but not stationary or backwards); handrim would have to have various degrees of freedom
  - Cons: difficult mechanically to create; type of brakes activated by handrim would probably be cable which introduces problems
Brainstormed Ideas

• **Rotawheel crankshaft**
  – Description: utilize existing Rota parking brake but make it more accessible
  – Function: parking brake
  – Logistics: install crankshaft so that parking brake can be activated more easily
  – Cons: does not address retarding brake or anti-rollback mechanism; difficult to design crankshaft that remains upright
Brainstormed Ideas

• **Independent handrim**
  
  – Description: pushing forward on handrim would push wheel forward, but back ward would activate a brake instead of using friction to stop wheel
  
  – Function: retarding brake; potentially parking brake
  
  – Logistics = cons
Selected Idea

• **Coaster Hub Anti Rollback Brake System**
  – Description: Incorporates many of our ideas, including an independent hand rim, variable braking and anti rollback
  – Function: Uses the mechanism found in many 1-speed bikes, called a coaster brake hub. Instead of bike pedals, we attach a handrim
  – Logistics: These coaster brake hubs are commercially available and easy to obtain.
  – Pros: Simple installation, lessens need for custom manufacturing, no friction on hands when applying a braking force
  – Cons: The standard coaster brake hub does not include a parking brake solution
Visualizations

1. Guarded Handrim
2. tv’s device
3. Push-in hand-rim
4. Rota wheel crankshaft
5. Wheel of Fortune wheel - dial hub

- Apply variable braking by rotating hand-rim backward.
- Rotate all the way back to lock (to-do, customize mech for this purpose)

Problem: Going Backwards
Selected Idea

• **Technical Feasibility:** not a totally new concept, simply taking it from a bike and putting it on a wheelchair

• **Engineering Difficulty:** creating an adaptor from the wheel to the chair can be easily done on the lathe.

• **Estimated Cost:** $249, commercially-available package

• **User Acceptance:** after our interviews, this solution seems to solve many of the problems faced by wheelchair users. Implementation looks like a normal wheelchair

• **Safety Considerations:** Our solution is safer than existing wheels because it lessens wear and risk of injury to the hands.
Selected Solution

Axle is rigidly attached to chair

Handrim connects directly to sprocket
Future of Rota brake

- Modify coaster hub to include a parking brake
- Allow coaster hub to easily switch between forward and reverse
- Design and manufacture an adaptor for the coaster hub axle to fit the wheelchair
- User testing and feedback on design
Spin a Story

SuperK:
Krystal Le

Project: Investigate and develop new educational activities appropriate for children with disabilities. This may include mechanical and/or computer software solutions that will provide interactive access for these learners.
Spin a Story

Krystal Le

Resource Area for Teaching (RAFT) Project
• **Background:** Resource Area for Teaching (RAFT) creates hands-on activity kits for students nationally.

• **Problem:** Special education teachers report that they often wish there were more activities focused on children with disabilities.

• **Aim:** Investigate and develop new educational activities appropriate for children with disabilities.
Design Criteria

- Intellectually Stimulating
- Accessible
- Affordable
Overview

• Problem & Unmet Needs
  • Needfinding
  • Existing Solutions

• Brainstormed Design Concepts
• Description of 3 Selected Designs
  • Future Steps
The Problem + Needfinding

Challenges Students with Autism Face
Difficulty Communicating!
Hope Technology School

- Erlinda Cruz Quintero
  Vocational Education Program Teacher
- Sandra Burke
  Speech Language Pathologist
- Jen and Maisa
  Special Education Teachers
Common Challenges
Existing Solutions
Sensory OVERLOAD!
Brainstorming
• Spelling Games
• Word and Picture Puzzles
• Personalized Workbooks
Prototyping + 3 Designs
Physical Description: A rectangular box with a clear pocket at the top and a series of flashcard holders at the bottom. In this picture, there is a piece of paper in the pocket with the question, “What do you want to do today?” written on it. The three flashcards at the bottom show pictures of a computer, a family running outside, and a mother and daughter sleeping. Each flashcard is accompanied with a word or phrase (“Computer,” “Go outside,” “Sleep”).
Physical Description: A similar picture but with the question, “How are you feeling today instead with different flashcards.
Physical Description: A series of flashcards with different pictures of subjects ("mommy", "house"), verbs ("run", "eat"), and articles/prepositions ("to", "the") pinned with thumbtacks to a cork board. The flashcards are arranged to form sentences.
**Physical Description**: Different pieces of fabric (with stickers on top of them) are lying on a corkboard/storyboard. Some of these stickers are pictures of bears, dancing hippos, penguins, etc.
Future Steps
USER TESTING + REITERATION
Thank You!

Questions after class!
**Piano Pedal**

*Team name:* Ntokozo Bhembe

*Project:* Explore designs that would enable a Menlo Atherton high school student with paralysis to operate the sustain foot pedal on his electronic music keyboard.
Piano Pedal Project

Project Suggestor: Zack & Darci Wentz
Ntokozo Bhembe
Zack “Music and Sports are my two passions”

• Has signed basketball from Lebron James
• Also plays the guitar and enjoys rapping
Project background

- Zack Wentz
- Amazing young man born with acute epidural hematoma (blood clot) along his spinal cord from vertebrae C6 to T4
- Zack has lost use of his body starting
Investigating the Problem

• Zack plays electronic keyboard but has no use of his legs

• He also has no control of his upper body posture due to lack of core muscles
Existing solutions: None

• Zack’s solutions:
  • Tried using his mouth but that didn’t work because he couldn’t fit the entire pedal in his mouth and wanted to sing/rap
  • Has tried to use forehead (very uncomfortable and not practical)
  • Often gets help from his mom/family members to operate the pedal for him
Existing potential solutions:

- Zack has done extensive research
- Switch sip/puff switch
Existing potential solutions:

- AM/FM Radio with tilt switch headset (Model 340) with set of head position headphones
HeadMouse® Extreme
Wireless Head Controlled Mouse

• Uses head movement to move cursor on screen
• Could be adapted as a switch
The problem with these:

• Too expensive to be practical
• Involve “unnatural movement” from use
• Restrict the use of the mouth
• Too complicated
Explored ideas: The pedal

• Understanding the Sustain Pedal
• Just a switch
Explored ideas: Back operated pedal

By rocking back and forth the pedal is operated

Pros
Relatively simple

Cons
Zack has virtually no core muscles
Explored ideas: Mouth operated switch

Operated by pressing switch with teeth by biting

Pros
Simple and small

Cons
Prohibits singing
Explored ideas: Armpit switch

Operated by pressing pedal in between the armpit

Pros
Not as weird and easy to make.
Would be cheap

Cons
Restricts arm range of motion
Explored ideas: Winner

Came out of observations made during visit with Zack for a meeting

Zack has to lean with his left arm to support his torso

Integrate pedal into arm-rest solution
Problems encountered

• Acquiring a piano pedal to take apart and perform a product forensics
• Means to travel and see Zack more often
• Lack of teammates to bounce ideas with
Accessible Eateries

Team name: Nicole Torcolini

Project: Create an accessible database of restaurant menus that can be accessed via a website or a mobile application.
Accessible Eateries

Nicole Torcolini
(and Lexia)
<table>
<thead>
<tr>
<th>A La Carte</th>
<th>Combo</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>The Axe</td>
<td>The Billy Erb</td>
<td></td>
</tr>
<tr>
<td>6.25</td>
<td>6.00</td>
<td></td>
</tr>
<tr>
<td>7.25</td>
<td>7.00</td>
<td></td>
</tr>
<tr>
<td>Five ounces of Angus Beef</td>
<td>Free Range Turkey Burger</td>
<td></td>
</tr>
<tr>
<td>Item</td>
<td>A La Carte</td>
<td>Combo</td>
</tr>
<tr>
<td>-----------------------------</td>
<td>------------</td>
<td>--------</td>
</tr>
<tr>
<td>The Axe</td>
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</tr>
<tr>
<td>Five ounces of Angus Beef</td>
<td></td>
<td></td>
</tr>
<tr>
<td>The Billy Erb</td>
<td>6.00</td>
<td>7.00</td>
</tr>
<tr>
<td>Free Range Turkey Burger</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
An Alternative

The Axe
Five ounces of Angus Beef

- A La Carte $6.25
- Combo $7.25

The Billy Erb
Free Range Turkey Burger

- A La Carte $6
- Combo $7
The Website

• http://www.accessibleeateries.com
Social skills for elementary students with Autism Spectrum Disorders

*KinExpressions!:*
   Anna Ly and Hain-Lee Hsueh

**Project:** Explore mechanisms of enhancing social skills for students with Autism.
kinExpressions!
Learning and Applying Emotions with Kinect

Assistive Technology
ENGR 110 | 210
Anna Ly | Hain-Lee Hsueh
Team LDT

Background in ECE and Software Engineering from Cornell. Formally worked for Oracle Enterprise Applications.

Background

Autism Today

- 1 in 110 American children are on the autism spectrum
- More children this year will be diagnosed with autism than with cancer, diabetes or pediatric AIDS COMBINED
- ASD affects 3 million individuals in US / 10 million worldwide

Diagnosis Criteria (DSM-IV)

Qualitative impairment in social interaction as manifested by two of the following:

- Use of nonverbal behaviors
- Failure to develop peer relationships
- Lack of social or emotional reciprocity
- Lack of empathy
Empathy

Pamela Wolfberg  
*SFSU, Associate Professor of Special Education*
- "We stress integrated play *initiated by the children* themselves."
- "We don’t want them to see this as instruction time. We want the situation as *natural and random as possible*”

Michelle Fong  
*Associated Learning & Language Specialists, CCC & SLT*
- "A lot of kids *can't imitate facial expressions*...or sometimes they over-exaggerate so it looks unnatural."
- "The facial teaching tools they have today where you put together faces (eyes, noses and mouths) have parts that don't even look human. The smiles are *angular and look robotic*.”
- "*Play needs to be complex* and they need to be able to transfer it to a natural context. If they do not reach that level, they will continuously be *behind as they grow older*”
Empathy

Sandra, Erlinda, Jen, Maisa
OT / SLT @ Hope Technology School

• "What's frustrating about applications is that sometimes, kids just want **to click on it to get the feedback instead of actually learning**”

• *Sandra:* “One kid once came up really close to me (*stands up against another staff member to illustrate*) and said, “It’s nice to meet you!” and I had to back away to let him know that **he was standing too close.**”

Evelina Liu
Mother of 5 year old boy with autism

• "**Communication is a major problem**...when I ask him a question, he often doesn't answer it and just says whatever happens to be on his mind at the moment."
Define

5-10 year old children with mild to moderate autism need a way to recognize and express both emotions and social nuances because failing to do so may lead to social isolation as well as delayed psychological and educational development.
Existing Solutions

mindreading

Feel Electric

The Transporters

market research
Limitations

• “Glorified Flashcards“
• Unrealistic
• Effective emotion recognition, but no solution for evaluating emotion expression
• Individual learning vs. interpersonal experience
• Not multisensory or kinesthetic
• Gender constraints
Ideation: Initial Brainstorming
Ideation: Design Concepts

Facilitated Group Story Creation (video)

Color-changing Tiles

Interactive Social Story Quest

Music Generation with Blocks (video)
Selected Design: kinExpressions!

Core Concept
• Teaching and practicing emotions with others through facial & gestural recognition and expression using the Microsoft Kinect.

Core Mechanic
• Facial & gestural expressions are modeled
• Players must imitate and match the face
• Players' faces are displayed real-time
• Video Prototype ("MotionEmotion")
kinExpressions!

Technical Feasibility
• Kinect resolution can distinguish facial features
• Numerous SDK's available for development

Engineering Difficulty and Performance
• Processing, filtering, and analyzing data from the Kinect sensor
• Algorithms for matching two facial expressions
• Fidelity of graphics, animation, and texturing (for displaying characters and players' face)
kinExpressions!

Estimated Cost

- Kinect sensor: $150
- Learning resources for Kinect development: $0 - $30?
- License for existing facial recognition algorithms and data: ??

User Acceptance

- Therapists forecast Kinect as the "next big thing"
- Off-the-shelf Kinect games already being used (video)
- Therapists constantly seeking for multisensory tools
Design Considerations

• **HMW** get kids with autism to empathize? (i.e. imagine things from others' perspective?)
  – *Ex: Cars in the cookie bag*

• **HMW** get kids to transfer what they see on the screen
  – *Ex: Child getting a haircut*

• **HMW** convince kids with autism that social rules are important (e.g. picking your nose is bad)

• **HMW** leverage multi-sensory input without inducing sensory overload
Current Activities / Status

• **Underway**
  – Meeting with Director of Developmental Pathways for Kids
  – Participatory design for our current prototype
  – Fleshing out more interaction points
  – Evaluating idea of prototyping a mobile app to demonstrate proof of concept

• **Pending**
  – Obtaining algorithms for facial/emotion recognition
  – Contact with researchers at Microsoft
  – Potential meetings with other researchers in emotion recognition and autism
Challenges

- Difficulty in observing children play groups
- Working with non-typical children
- Strategies for "off-loading" engineering challenges to existing solutions
- Coordinating shared access to a Kinect sensor
## Going Forward

<table>
<thead>
<tr>
<th>Week 7 – Feb 20</th>
<th>Week 8 – Feb 27</th>
<th>Week 9– Mar 1</th>
<th>Week 10 – Mar 8</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Phone conference with researchers from MIT</td>
<td>• Program to display a picture on one side, and a skeletal/face-tracking picture of the player next to it</td>
<td>• User test to see what ideas come out of this kind of set up and interaction</td>
<td>• Continue refining</td>
</tr>
<tr>
<td>• Decide which SDK to use</td>
<td>• Decide on 1-2 key emotions and 2 scenarios for each</td>
<td>• More partic. design</td>
<td>• Explore ideas for multi-player interaction</td>
</tr>
<tr>
<td>• Get up and running with kinect and sdk (sample code)</td>
<td></td>
<td>• Refine prototype to flesh out 2-4 scenarios and game play</td>
<td></td>
</tr>
<tr>
<td>• Get IRB</td>
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</tbody>
</table>
Low Cost Transfer Device

Transfer-mations:
Sofia Rojasova, Nick Akiona, and Rahul Sastry

Project: Explore designs for a low cost transfer device for a wheelchair user.
Transfer-Mations

Nick Akiona, Sofia Rojasova, and Rahul Sastry
Mission Statement

Under guidance from Rotamobility, we aim to create a low cost transfer device that reduces the physical strain of transfers, is portable yet applicable to most situations, and provides a feeling of safety.
Scope of the Problem

- Understand the point-to-point transfer challenges
- [http://www.youtube.com/watch?v=JJWo8FFfjuE#t=0m18s](http://www.youtube.com/watch?v=JJWo8FFfjuE#t=0m18s)
- Understand clinical recommendations for how-to transfer
  - PT/OT endorsement

- ~2.8 million U.S. wheelchair users
- ~10,000 people every year are spinal cord injured
- ~80% of wheelchair users are over 44 years old
Interviews and Needfinding

We interviewed 3 wheelchair users and are in the process of consulting with a PT.

• Issues to consider:
  o Cost
  o Material strength
  o Portability
  o Strain injuries
    ▪ Peak strain force
    ▪ Repetitive strain
  o Elevation changes
  o Feeling of security
  o Feeling of independence
  o Family
  o Low profile
Existing Solutions

- Transfer Boards
  - Sliding Transfer Boards
- Transfer Handle
- "Magic Pole"
- Motorized Lift
Brainstorms

- Like rowing machine
- Like back transfer devices
- Foldable stand
- Slide seat
- Swing post
- Swing arm
- Motorized sliding board
- Hydraulic jack
- Strap to move legs
- Adjustable like a car
- Moves legs forward
- Handcots to push off
- Wednesday night wiretaps
Final 3 Candidates

- Swing arm
- Seat Jack
- Transfer Board 2.0
The Swing Arm
Ways to Improve the Slide Board

- Foldable
- Mount to chair when not in use
- Easier for family members
- Magnets
- Pull up handles
- Attach board
- Shape
- Fold down
- One or two legs
- Better adhesive surface
- Pull up handle
- Secure mount to chair
- Grooves to constrain legs
- Only 3

Elevation (like a jack under seat)
- Grooves to constrain legs
- Pull up handle
- Shape
- Tilt
- Make for balance
- Fold down
Best Solution

Add ons:
1. Sliding Seat
2. Folding Stand
3. Mount to wheelchair

[Diagram of a device with a handle, locking mechanism, and various parts labeled as seat, trunk, and board with legs capable of adjusting.]
Next Steps

• Interview with OTs & PTs
• Prototyping
• Concept Evaluation with Actual Users
• More Iterations
The End
Works Cited

• http://www.newdisability.com/wheelchairstatistics.htm
• http://codi.buffalo.edu/graph_based/.demographics/.statistics.htm
Friendly Cane

Team Wombat:  
Nate Wynn and Cindy Au

Project: Explore designs for a light weight cane that can accommodate the weight of its user and easily retract and extend with one hand.
TEAM WOMBAT

PROJECT iCANE

- ENGR 110: Perspectives in Assistive Technology

Midterm presentation
16 Feb 2012
OUR TEAM

CINDY AU
Class of 2013
Major:
Biomechanical Engineering
Hometown:
Bentre, Vietnam

NATE WYNN
Class of 2012
Major:
Mechanical Engineering
Hometown:
Spokane, Washington
PRESENTATION OUTLINE

1. introduction
2. need-finding
3. research
4. our project
5. future work

Midterm presentation
PRESENTATION OUTLINE

1. introduction
2. need-finding
3. research
4. our project
5. future work
Current canes are heavy and awkward to stow when they are not being used, and clumsy to use when both hands are needed - such as when carrying something.

Explore designs for a light weight cane that can accommodate the weight of its user and easily retract and extend with one hand.

1. Effective in addressing users’ need
2. Attractive
3. Low cost
AID DEVICE DEMOGRAPHICS

According to a study completed in 2000:

Just over **6.8 million** Americans living outside of institutions use assistive devices to help them with mobility.

Canes are by far the most widely used mobility devices: **4.8 million** Americans use them.
AGE DEMOGRAPHICS

Cane use in the United States

- Under 18
- 65 and over
- 18-64
According to a survey involved 1000 Canadian seniors aged 70 and older, 7 out of 10 seniors report having a mobility or health issue that reduces their quality of life due to a physical limitation. Yet, 46 percent of those surveyed refuse to use a cane, walker or scooter.
PRESENTATION OUTLINE

1. introduction
2. need-finding
3. research
4. our project
5. future work
NEED-FINDING METHODS

1. interviews
2. observation
3. survey
SURVEY PARTICIPANTS

Gender:
- Female: 67%
- Male: 33%

Age:
- 70 or older: 44%
- 60-69: 44%
- 50-59: 11%
Desirable Improvements

<table>
<thead>
<tr>
<th>Improvements</th>
<th>Count (person)</th>
</tr>
</thead>
<tbody>
<tr>
<td>More hand freedom</td>
<td>5</td>
</tr>
<tr>
<td>More comfortable handle</td>
<td>4</td>
</tr>
<tr>
<td>More fashionable</td>
<td>3</td>
</tr>
<tr>
<td>More sturdy</td>
<td>2</td>
</tr>
<tr>
<td>Lighter weight</td>
<td>1</td>
</tr>
<tr>
<td>Add-on functions</td>
<td>1</td>
</tr>
<tr>
<td>Easier transport and storage</td>
<td>1</td>
</tr>
</tbody>
</table>

Midterm presentation
PRESENTATION OUTLINE

1. introduction
2. need-finding
3. research
4. our ideas
5. future work
EXISTING SOLUTIONS

- Adjustable folding cane
- Fiesta Flamingo walking stick
- Self-balance walking stick
- Vital stats stick

Midterm presentation
EXISTING SOLUTIONS

PRODUCT

Adjustable folding cane

DETAILS

- Lightweight anodized aluminum body
- Height adjustments from 31” to 35”
- Can be folded up into four sections to be conveniently stored in a black canvas bag
- Supports up to 250 pounds
- By far the most well-received commercially available product

LIMITATIONS

- Difficult to assemble and to take apart using one hand
- Metal tube body doesn’t look attractive
- Ergonomics
EXISTING SOLUTIONS

PRODUCT

Self-balancing staff

DETAILS

- Consist of a simple hand grip and a weighted bottom
- Stand upright by itself on both even surfaces and slopes
- Hands can be used for other tasks when needed
- Small base to allow easy climbing of stairs
- Nice, clean design

LIMITATIONS

- Not yet commercially available
- Cost - might not be covered by insurance
- Weight - heavy weighted bottom can cause fatigue.
- Can’t be stored in bag
- Difficult to store in car
EXISTING SOLUTIONS

PRODUCT

Fiesta Flamingo Crutch

DETAILS

- Ergonomic
- Simple and aesthetic form
- Shock absorbing
- Height adjustable
- Looks really cool

LIMITATIONS

- Concept only
- Might be difficult to store and carry around
- Seniors who don’t want their cane to look too conspicuous might not find the “fiesta” look to their liking
EXISTING SOLUTIONS

PRODUCT
The Aid

DETAILS

› “The world’s first smart cane”
› Monitor seniors’ pulse, blood pressure and body temperature
› Offer a simple navigation system
› SOS button to alert home location when getting lost
› Won Grand Prize at the Fujitsu’s Design AWARD 2011

LIMITATIONS

› Ergonomics
› Cost
› Storage
PRESENTATION OUTLINE

1. introduction
2. need-finding
3. research
4. our project
5. future work
IDEA
#1

Detachabe magnetic cane segments
IDEA #2

Ergonomic self-standing inverted handle
IDEA
#3

Expandable handle
PROTOTYPE
#1
PROTOTYPE
#1
PROTOTYPE
#1
OUR PROJECT

- ideation
- prototyping
- budgeting
- time management
- aesthetic

Midterm presentation
PRESENTATION OUTLINE

1. introduction
2. need-finding
3. research
4. our ideas
5. future work
E WORK

MAKING THE DESIGN FUNCTIONAL
› Integrate the handle design and the collapsible shaft design
› Have a functional prototype of a collapsible, ergonomic, and free standing cane by the end of the quarter

MAKING THE DESIGN ELEGANT
› Explore ways to improve the aesthetic of the prototype
› Manufacture the new design

QUALITY CHECK
› Usability test
› Refinement
THANK YOU

for your attention
Customize the Wheelchair

Team name: Mia Davis

Project: Explore ways to add a personal aesthetic to wheelchairs.
Fini
Short Break