Nav-Easy.AI

A Web for All: Generative AI Powered Navigation for the Neurodiverse

Team Zenith
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Nishit Bhasin
nbhasi@uw.edu
LinkedIn

Ansh Shah
ansh4@uw.edu
LinkedIn

Sheel Sanghvi
sheels@uw.edu
LinkedIn

Our Sponsor

KARTIK SAWHNEY
Senior Product Manager
Microsoft (AI for Accessibility)
Need for Inclusivity

Why enhance web accessibility for neurodiverse users?
Prevents digital barriers and promotes independence.

Why address cognitive and sensory challenges?
Reduces isolation and enhances access to opportunities.

Why prevent isolation for neurodiverse individuals?
Ensures legal compliance and supports societal inclusion.

Why fulfill legal and moral obligations for equal access?
Builds societal trust and supports community.

Why value societal integrity and community cohesion?
Web Accessibility

7.29 M
Autism Spectrum Disorders (ASD)

8.25 M
Attention Deficit Hyperactivity Disorder (ADHD)

59.4 M
Multiple signs of Dyslexia

96%
Web pages not accessible

50.8 errors
Avg. detectable accessibility errors/home page

98%
Home pages not complying with WCAG 2.1

~ 50%
People with disabilities noting no improvement in web content accessibility

815,600
Accessibility issues found in Fortune 100 company websites
The Challenge

EXPLAINING THE DIFFICULTIES NEURODIVERSE USERS FACE ONLINE AND WHY IT MATTERS.

Information Overload

Navigational Challenges

Text-heavy Content

Distracting Elements

Lack of Customization
NavEasy.AI

NavEasy.ai is an AI-driven voice navigation tool that enables hands-free, conversational access to any webpage for neurodiverse users.

Simply command "NavEasy, help me buy..." and it interprets, searches, filters, and guides you through the process with auto-clicks and voice guidance.
Voice or text commands

Say or type what you need, and it does it for you. No browsing, no clicking, no overload, just convenience.

Audio Product Descriptions

Get detailed descriptions read aloud, making screen readers more effective.

Hands-Free Navigation

NavEasy takes the place of a mouse or keyboard, moving through pages and making selections.

Here’s what Nav-Easy.AI brings to the table
Generative AI Powered Navigation for the Neurodiverse

Focus on inclusivity, user-centered design, and collaboration with stakeholders.

1. Ideation, Problem Identification, and User Research
2. Requirement Gathering, Analysis, and Prototyping
3. Iteration, Development, and Implementation
4. Deployment and Dissemination
Ideation, Problem Identification and User Research

**Ideation and Problem Identification:**
- Recognized accessibility challenges for neurodiverse individuals navigating the web world
- Identified gap in existing solutions targeting specific conditions vs. broad neurodiversity
- Conceptualized AI-driven solution to enhance accessibility without UI modifications

**User Research and Interviews:**
- Collaborated with organizations: DO-IT Center, UW, D-Centre, Huskies for Neurodiverse, Holistic Child Centre
- Conducted extensive user research and interviews (secondary ethnographic research)
- Gathered insights on cognitive overload, distractions, navigation difficulties faced
Requirement Gathering, Analysis, and Prototyping

Vision-Enabled Web Navigation:
- Analyzed research to define key accessibility requirements
- Identified needs: voice commands, simplified content, adaptive displays
- Prioritized features reducing cognitive load and enabling personalization

Prototyping & Iterative Design
- Developed low-fidelity prototypes
- Incorporated feedback from users, experts (CREATE hackathon, CSUNAT conference 2024)
- Iterated to enhance intuitive design, focused content zones, and context-aware presentation
- Evolved from basic text-to-speech to more natural voice (OpenAI API)

Key Features Illustrated
1. Voice-assisted content summary activation area.
2. Input field for navigation commands.
3. Simplified content display with prominent navigation buttons.
System Architecture

Technical Approach:

- Vision-enabled technology for mouse/keyboard control
- Examines annotated browser screenshots at each step
- Employs "ReAct" reasoning and action loop
- Uses Set-of-Marks-like image annotations as UI affordances
- Allows effective interaction with browser-based tools
- Agent architecture with optional LangSmith tracing
  - Inspects and debugs agent's webpage trajectory
**Deployment and Dissemination**

**Implementation:**

- Launched the "NavEasy.ai" solution as a web-based tool accessible to neurodiverse individuals.

- Next step is to create educational materials and provide training resources to support widespread adoption.

- We have scoped our implementation and testing to e commerce webpages and this is further envisioned to be scaled at other webpages.

Throughout the project, our team maintained a focus on inclusivity, user-centered design, iteration, and collaboration with stakeholders.
Optimized Navigation for Enhanced Accessibility - Benefits

Intuitive Interaction Design
Simplified layouts and visual cues aid easy navigation for cognitive ease.

Voice-Enabled Command Interface
Direct voice commands allow seamless section transitions, reducing navigation complexity.

Context-Aware Content Presentation
Adaptive content displays customize based on user interaction, enhancing personalization.

Focused Content Zones
Essential information is highlighted, reducing distractions for users with attention deficits.
Impact of our solution

Direct Content Interaction
- Instantly understand site content

Customized User Controls
- Adapt visuals and text for ease

Streamlined Compliance Pathways
- Meet WCAG standards effortlessly

Neurodiverse Market Engagement
- Engage the neurodiverse community

Error Reduction in Navigation
- Reduce errors with smart commands