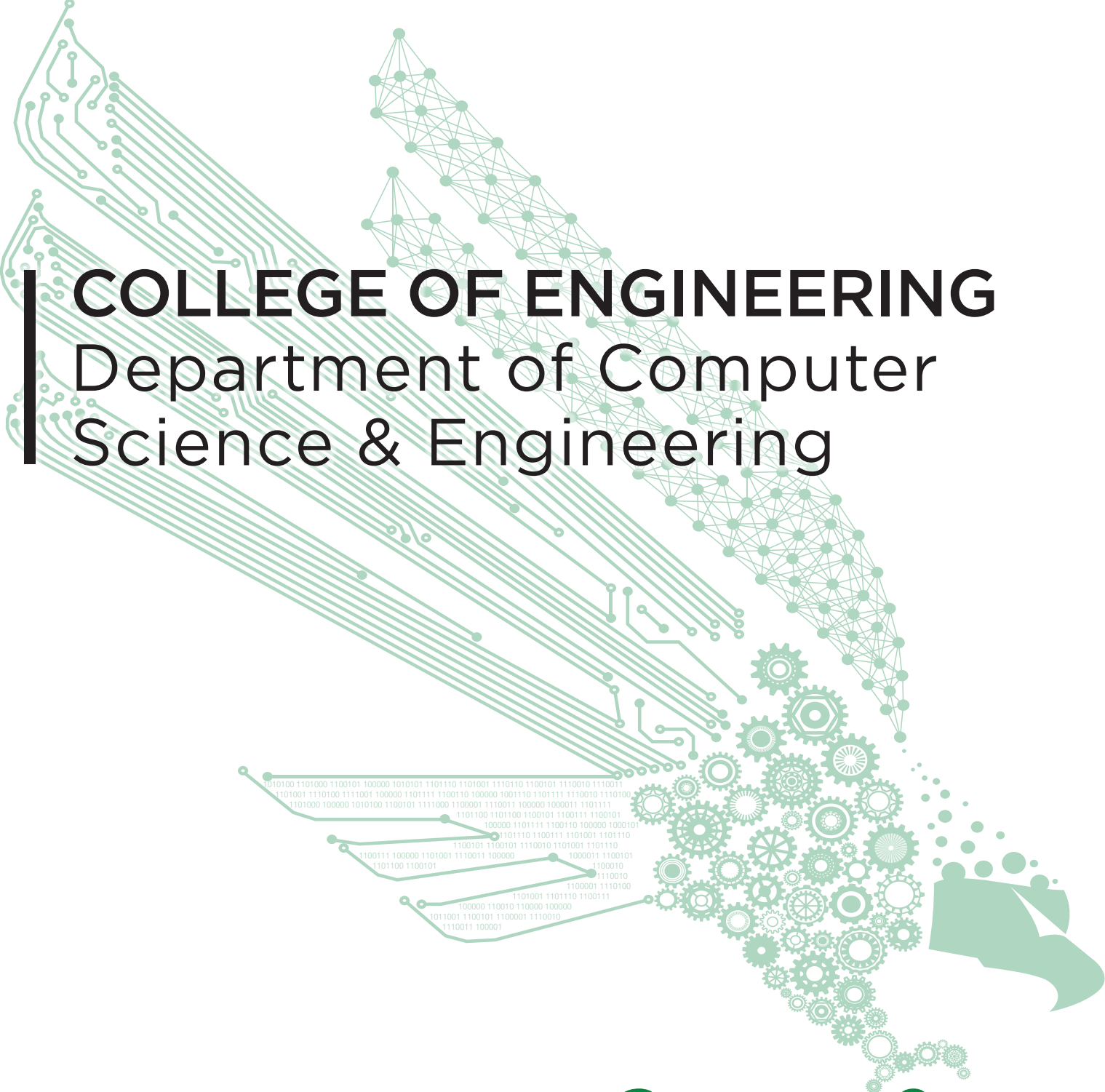




Senior Design Day Spring 2024

A large, abstract graphic in shades of green that forms the shape of the state of Texas. It is composed of various elements: circuit traces on the left, a neural network of nodes and connections in the upper middle, and a cluster of interlocking gears on the right. At the bottom left, there are several lines of binary code (0s and 1s) connected to the circuit traces.

COLLEGE OF ENGINEERING

Department of Computer Science & Engineering

COMPUTER SCIENCE
Senior Design Abstracts
Spring 2024

Usability Education Tool

Team Members

Will Witherspoon
Andrew Pamer
Judd Stone
Corey Johnston
Cade Howard

External Sponsors/Mentors

Internal Sponsors/Mentors

Dr. Wajdi Aljedaani

Abstract

The Usability Education Tool is sponsored and directed by Wajdi Aljedaani and is a website designed to teach Nielsen's 10 usability heuristics in an interactive manner. The website allows the user to create an account and track their progress through that account on a statistics page. Featuring curriculum for each of the 10 heuristics as well as a quiz and an interactive activity. The activity is an interactive drag and drop UI builder game. This project uses React, HTML, CSS, Javascript, Next JS, and Node JS for the website. While also utilizing Bootstrap for the UI. To store the data for each user and the user accounts the website utilizes Firebase. Several libraries are pulled in including DND Kit and ReCharts for UI builder functionality.



Data Dynamo

Team Members

Richard Boysen
Dom Argento
Scott Avery
Joshua Hartle
Hoang Thanh Minh Nguyen

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Internal Sponsors/Mentors

Dr. Stephanie Ludi

Abstract

Our group was tasked with creating an educational VR game that teaches the fundamentals of C++ to solve the problem of students having trouble initially getting into learning the programming language. Our game functions as a maze traversal and a high-stakes puzzle solver. For UI and function design, we utilized Unreal Engine 5, taking advantage of their built-in blueprints and design features. We also utilized C++ in our backend functionality. With these systems, we are able to create a working and fun game for all C++ beginners.



Rest'Assured: Finding Handicapped Restrooms

Team Hex

Team Members

Measam Ali
Katia Maldonado
Fabrizio Lopez
Daniel Hughes
Noah Daniels

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Dr. Wajdi Aljedaani

Abstract

Our Objective was to make a web app that can help those with disabilities find restrooms quickly and effectively that can accommodate them. Our web app allows the person to search for restrooms within a radius around their location or address, as well as add restrooms to the app so that they will be visible to other users. The website will not only show where the restroom is but also the route to get there. There will also be reviews set in place to help determine the quality of the bathrooms they select. On the internet, there many websites out there that help people find



Scheduling Assistant

Team Members

Joshua Sterken
Patrick Brzezina
Tejas Sawdekar
Kelvin Nguyen
Ivo Abangma

External Sponsors/Mentors

Internal Sponsors/Mentors

Dr. Wajdi Aljedaani

Abstract

In our fast-paced digital world, effective time management remains a constant challenge for university students and individuals alike. To address this pressing issue, we introduce the “Scheduling Assistant” web application, which is a user-centric solution aimed at optimizing task management, automating repetitive actions, and reducing stress associated with missed deadlines.

Syntax Squad Graph Sonification



Team Members

Brandon Sharp
Cody Walls
Jason Wolfe
Ethan Batres
Alex Kesler

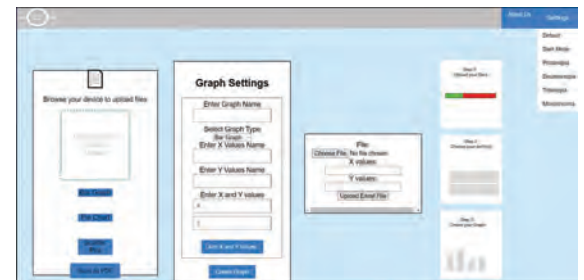
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Dr. Stephanie Ludi

Abstract

The visually impaired are limited in the amount of tools they can use when working data in our current world. Our team strived to create a new tool which would aid the visually impaired when working with graphs. The user will be able to upload their data or input it manually and create different types of graphs all in one page. In order to present the information and data to our target audience we used graph sonification to present the data in a different form. Using sonification, the data is read and used to generate a tone. We wanted to do this project to help a underrepresented part of the world have better access to tools to help them out. Not everyone can afford high subscription based services so we hope our tool can help people in need, for the foreseeable future.





Transcribro

Team Members

Ryan Bell

Alexia Cobb

Javier Gutierrez

Nicholas Ingenito

Maksym Petrusa

Farouq Siwoku

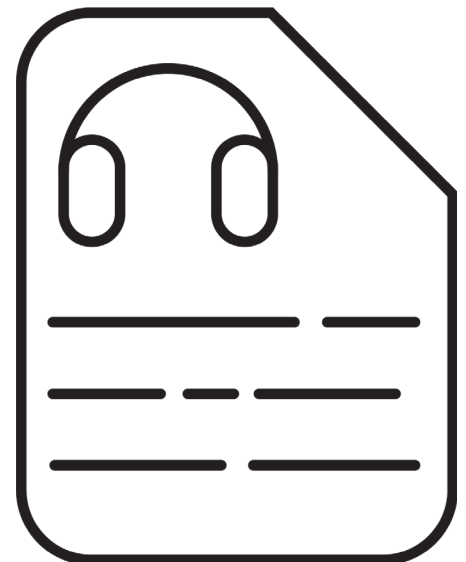
External Sponsors/Mentors

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Dr. Wajdi Aljedaani

Abstract

Transcribro is a web-based tool that was designed to make audio-based media accessible for users that are deaf or hard of hearing. Users can upload a file of a podcast, interview, or any spoken audio and receive a downloadable transcript or alternatively encode subtitles on to a downloadable video. With a focus on accessibility, after generating video subtitles or an audio transcript, users can customize text styles and formatting to meet their preferences. All downloaded files will reflect any changes made. Additionally for audio transcripts, an interactive view can be toggled that will highlight and scroll text in sync with the audio playback. Users have access to media controls to play, pause, or jump to different timestamps by clicking on the text blocks or the audio progress slider. Multiple languages are supported for transcription even for languages different than the original file.



Badge Scouters

Team Members

Nick Wylie
Hersh Krishna
Vikas Karthikeya raja

External Sponsors/Mentors

Internal Sponsors/Mentors

Dr. Stephanie Ludi

Abstract

This project aims to create a centralized web application that not only compiles retired badge requirements, complete with images but also allows for the crowd-sourcing of variations and corrections. This web app will not only benefit current scouts and leaders but also contribute to the preservation and sharing of the Girl Scout legacy.

Waving: From Space to Ocean

Team XR Ocean

Team Members

James Heath
Erin Hook
Chelsey Leung
Zachary Lund
Sean Moulton
Spencer Olson

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Internal Sponsors/Mentors

Dr. Ruth West

Abstract

NASA launched their Plankton, Aerosol, Cloud, ocean Ecosystem mission, PACE, on February 8th, 2024. In celebration, NASA will host an interactive artwork exhibit that will be made in collaboration with teams at the University of North Texas and the University of Maryland (UMD). Our team's goal is to create a reconfigurable and modular input system for audience interaction to drive the visualizations UMD is creating. The final result will be a compelling scientific exhibit that will properly represent the scale and importance of the mission while also keeping the public engaged.

BrixColor Finder

Team Members

Anusha Majeed
Sahardeed Ahmed
Jonathan Collazo
Mahmoud Algharbawi
Vandit Jindal

External Sponsors/Mentors

Internal Sponsors/Mentors

Dr. Stephanie Ludi

Abstract

This project aims to address accessibility challenges by developing an iOS and Android application focused on identifying specific LEGO Mindstorm Blocks within a large pile and isolating individual pieces. The primary goal is to streamline the construction process of Mindstorm Robots, making these projects universally accessible. The project seeks to tackle the scarcity of applications tailored to LEGO Mindstorm sets, particularly for visually impaired individuals. Additionally, it aims to enhance convenience for enthusiasts interested in building various LEGO sets beyond Mindstorm. The mission is to extend accessibility to a broader range of LEGO sets, fostering an inclusive and user-friendly building experience for all users. The project utilizes JavaScript and React Native for the user interface (UI) and Python and Node.js for the backend. By leveraging these technologies and engaging stakeholders effectively, the project aims to deliver an accessible and convenient solution for LEGO enthusiasts, fostering inclusivity and user-friendliness.

True Hue (Color Accessibility App)

Team Members

Tran Anh Thu Nguyen
Nghị Ho
Giang Tran
Hang Tran
Long Nguyen

External Sponsors/Mentors

Internal Sponsors/Mentors

Dr. Wajdi Aljedaani

Abstract

While there are tools out there to help people with color blindness, they often cost a lot and don't offer much in terms of customization. True Hue stands apart as a free tool dedicated to enhancing the digital experiences of color-blind individuals, as well as serving UX/UI designers and those with normal color vision seeking to leverage available resources. This product will be accessible through a web application, empowering users to upload photos and utilize our tool to enhance their visual experiences.

With implemented features like Color Palette, Color Recognition, Color Simulator, and Chatbot Assistant, True Hue makes it easier for individuals to navigate and understand colorful digital content.

Team Members

Carson Barker
Bryce Ellinger
Nil Patel
Logan Camp
Jorge Martinez
Brian Najera

External Sponsors/Mentors

Shield LLC

Internal Sponsors/Mentors

Dr. Wajdi Aljedaani

Abstract

Mass shootings in the United States continue to pose a grave threat to public safety, marked by their unpredictable nature and the urgent need for timely responses. The challenge lies in providing critical information to first responders swiftly, enabling them to locate those in danger and potentially identify the shooter's position. Current response methods often suffer from delays and inefficiencies due to limited real-time information.

To address this issue, our team aims to develop a proof-of-concept app designed to enhance response times during mass shootings. The app will offer real-time location tracking, distinguishing between individuals in danger and potential threats. This will aid with subduing the shooter as quickly as possible to save lives.



Scoutmaster

Team Members

Team Alpha:

Abdal Alkaissi, Daniel Padierna, Joshua Turcotte, Muhammad Umair

Team Cache Overflow:

Bruno Philippon, Inioluwa Ore-ofe Davies, Mitchell Hess, Samayra Rosales

External Sponsors/Mentors

Matthew Muhl

Internal Sponsors/Mentors

Stephanie Ludi

Abstract

Scoutmaster is a free mobile application available on iOS and Android for lovers of movies, TV shows, documentaries, and other forms of digital media. By combining GPS technology with an incredibly extensive media database, users can seek out and visit, or “scout” the shooting locations of their favorite scenes. As long as a user is in range of their desired shooting location, they can easily scout it and add it to their scouting activity.

To explore the intuitive scout map, users can search by title or by location to make scouting as easy as possible. This way, users have the option of scouting their favorite titles, or simply just exploring the shooting locations in their area.

By allowing its users to follow others and view their scouting activity, Scoutmaster also aims to serve as a social media platform to build communities of media lovers, whether they’re film buffs, casual TV watchers, or anything in between.

Though Scoutmaster already has the web’s most comprehensive media database, there is always room for more. Because of this, users can request that titles or shooting locations be added to the database if it’s not there already. Following a request, the Scoutmaster team will review it with a 48-hour guarantee.

MIndLift - A depression companion tool

Team Members

Akash Patel
Austin Hoffman
Hadia Bilal
Shawana Tahseen
Timmy Akundunni

External Sponsors/Mentors

Internal Sponsors/Mentors

Dr. Stephanie Ludi

Abstract

MIndLift is a mobile application designed as a companion tool for individuals facing depression. It provides a safe and supportive environment for self-healing and emotional exploration. It was developed using Dart and Flutter. It focuses on user-centric features e.g., Text classifier(will try to discern the user's emotion from their text), audio analyzer(will try to hear if user is crying or going through a crisis), goal setting and tracking, emotion logging, and emergency contact management. Utilizing a secure and local database(SQLite) and user-permission controls to ensure data security and user privacy. By offering a range of supportive functionalities, the app aims to empower users in their mental health journey, fostering resilience and well-being.

Team Members

Jack Kempf
Gaige Bigrigg
Ky Vang
Nathan Reed
Matthew Ko

External Sponsors/Mentors

Internal Sponsors/Mentors

Dr. Stephanie Ludi

Abstract

There is a lack of apps capable of helping people with impaired vision search for and locate pieces for LEGO mindstorms sets. The mission of this project is to create a simple, easy-to-understand app that enables users to find these peices and also keep track of them in the app, ran with a Machine Learning model.

Team Members

Zachary Tidwell
Michael Skrzynski
Owen Glasscock
Evan Reyes

External Sponsors/Mentors

Jeff Goke - Digital Cheetah

Internal Sponsors/Mentors

Abstract

In today's rapidly evolving digital landscape, businesses and individuals are inundated with vast amounts of unstructured textual data, ranging from documents, emails, and reports to articles and research papers. Managing, extracting insights from, and efficiently processing this information has become a significant challenge. Manual document processing is time-consuming, error-prone, and often cannot keep up with the sheer volume of data. This project is a document processor that uses ChatGPT AI to analyze a collection of user-uploaded documents and then allows the user to have a conversation about the documents with the tool.

The issue with current solutions to this problem is data and memory limits. Currently, the ChatGPT software has a relatively low token limit. While this limit is acceptable for quick questions and answers, problems arise for questions outside the general scope of knowledge. Furthermore, the pricing model associated with ChatGPT can become prohibitively expensive due to token usage. Our project aims to mitigate this data limit and allow users to ask in-detail questions about their group of documents, while also receiving accurate and detailed answers, at a cost effective price.

Garage Sale Finder

Team Members

Sam Alvizo
Oz Birdett
Reagan Stephens
Ethan Willinger

External Sponsors/Mentors

Internal Sponsors/Mentors

Dr. Stephanie Ludi

Abstract

Garage sales are a great way to acquire goods for low prices, but they are often difficult to find without a car, time for searches, or luck. This web application will solve this issue by reducing barriers for both the garage sale lister and potential customers. The application is designed to help sellers and potential customers connect as quickly as possible. We achieve this through a streamlined garage sale management system and a robust search feature allowing users to find sales that are selling their sought after items.

Team Members

Jimena Romo Cuevas
Audrey Suez-Panama
Tao Tang
Aisha Sulaiman

External Sponsors/Mentors

Internal Sponsors/Mentors

Stephanie Ludi

Abstract

ResearchFinder is a mobile application developed using Flutter, Dart, and Firebase, designed to connect university students with research projects offered by professors. This platform enables students to browse, message, and collaborate with professors, while professors can post projects and engage with interested students. With intuitive search features and messaging capabilities, ResearchFinder streamlines the process of discovering and participating in research opportunities, fostering academic growth within university communities.

SuppliShare

Team Members

Muhammad Ghazi
Logan Rosenbaum
Dewey Holland
Sriram Krishna Kumar

External Sponsors/Mentors

Internal Sponsors/Mentors

Dr. Stephanie Ludi
Saba Jazi

Abstract

In a world where education is key to future success, SuppliShare bridges the gap between educational needs and community resources. Our innovative platform empowers teachers by providing them with essential classroom materials, free of cost, through the generous donations of individuals and businesses. By simplifying the process of giving and receiving supplies, we foster a culture of support and sustainability. Join SuppliShare today - where every contribution paves the way for a brighter educational tomorrow.

Team Members

Britney Perdomo
Luis Alejandro Vargas
Kameron Gulley
Benjamin Tran

External Sponsors/Mentors

Jonathon Doran

Internal Sponsors/Mentors

Abstract

OneNote is a cross-platform note-taking application, built using Python and PyQt, it offers a versatile solution for users on Linux, Mac, and Windows operating systems. This program resembles Microsoft OneNote, and enables users to create, organize, and access notes seamlessly. With its intuitive interface and compatibility across platforms, users can enjoy efficient note-taking.

Note-Taker Support Tool

Team Members

Mauro Alvarenga
Trevonne Bridges
William Robertson
David Okoronkwo

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Internal Sponsors/Mentors

Stephanie Ludi

Abstract

The Note-Taker Support Tool seeks to provide a platform that streamlines ADA accommodations to help students receive the support they need in their courses. The tool connects students with accommodations, students who upload their notes to the platform, and professors to form an environment where the needs of students with disabilities are met without the extra hassle for all parties that comes with pairing up individual students.

Badge Scouters

Team Members

Nick Wylie
Hersh Krishna
Vikas Karthikeya raja

External Sponsors/Mentors

Internal Sponsors/Mentors

Dr. Stephanie Ludi

Abstract

This project aims to create a centralized web application that not only compiles retired badge requirements, complete with images but also allows for the crowd-sourcing of variations and corrections. This web app will not only benefit current scouts and leaders but also contribute to the preservation and sharing of the Girl Scout legacy.

Team Members

Aldo Monjaras
Ryker Valnes
Eric Phegley
William Whitten

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Internal Sponsors/Mentors

Jacob Hochstetler

Abstract

In our senior capstone project, we undertook the task of recreating the Envoy router in Go, focusing on essential functionalities such as listeners, routes, clusters, filter chains, and configuration management.

Our implementation revolves around the interaction of listeners, routes, and clusters to efficiently handle incoming requests. Filter chains enhance request processing by allowing for additional tasks, such as TLS inspection. Configuration management is streamlined through YAML file parsing, supporting dynamic updates through autonomous watching of the YAML file.

Request handling and routing are central to our project, encompassing parsing incoming requests, applying routing rules, forwarding requests to backend services with load balancing support, and comprehensive error handling. Our current implementation supports HTTP protocol.

Observability is facilitated through Grafana for comprehensive metric visualization and OpenTelemetry/Zipkin for request tracing, offering insights into router performance and behavior. Stress testing with Vegeta aids in identifying potential weaknesses and areas for improvement, with graphical results enhancing fault detection.

Teams Storm System and AgileMinds

Team Members

AgileMinds: Kaylyn King, Mason Besmer, Aaron Alexander, Dylan Estronza
Storm System: Matthew Rogers, Vincent Alcott, Jakob Edgeworth, Elizabeth Behrend

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Internal Sponsors/Mentors

Dr. Stephanie Ludi

Abstract

The UNT ABET Course Assessment Tool project is a survey system for UNT. Each term, students and faculty enter data for each course they are enrolled in/teach in the CSE department. This data is used to assess the department courses for ABET accreditation. Near the end of the term, students are given a link where they assess their CSE courses based on pre-specified course outcomes. After the course is completed, instructors have data (including attachments) that are provided. Reports are provided to the department Undergrad Curriculum Committee and the Undergraduate Coordinator so that the courses can be assessed according to the course and relevant program outcomes. There is a current system, which is hard to use and hard to maintain. This project aims to replace the old ABET system with a more user-friendly and streamlined one.

Group 17 - Texas Turtles

Team Members

Bikesh Baniya
Sean Moyer
Dinh Thang Nguyen
Ayden Savard

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Internal Sponsors/Mentors

Dr. Stephanie Ludi

Abstract

Our group is developing a Scavenger Hunt Hub that allows users to create their own scavenger hunts as well as play their own and other users' scavenger hunts. We tackled the issue of there not being a general hub where users can create and play scavenger hunts in a streamlined way. Our Scavenger Hunt Hub is a web application that can be accessed through computers and mobile devices, and can be used as long as the user has access to the internet.



Tool to Help Blind Students Program Lego Mindstorms Robots in Python by The Spam Artists

Team Members

Kelsee Villareal
Kevin Gautier
Alex Tomjack
Bryan Tang

External Sponsors/Mentors

Internal Sponsors/Mentors

Dr. Stephanie Ludi

Abstract

Mind Reader is a Visual Studio Code extension tailored to support visually impaired students in Python programming with LEGO Mindstorms robots. The goal of Mind Reader is to extend Visual Studio Code's pre-existing accessibility functions. Visual Studio Code currently offers a multitude of accessibility functions including high-contrasting themes and screen reader support. Still, it lacks accessibility options to make programming simple for people with visual impairments. With the use of Mind Reader, users are offered more extensive functions including a voice-to-text server, a customizable line highlighter, an option to read aloud errors and warnings, and much more. Furthermore, Mind Reader makes connecting and communicating with LEGO MindStorms hubs convenient and simple. By addressing the needs of the visually impaired community, Mind Reader overall promotes inclusivity and equal opportunity within the computer science field.

Teachers Aid by Team United

Team Members

Nikhil Luthra
Prem Adhikari
Charan Niroula
Sinjeena Khadka
Diwash Dhungana

External Sponsors/Mentors

Internal Sponsors/Mentors

Dr. Stephanie Ludi
Saba Yousefian Jazi

Abstract

In response to the financial challenges faced by teachers in providing classroom supplies, our senior design project presents “Teachers Aid” - an application designed to provide resources for the teachers within the educational community. Teachers Aid serves as a comprehensive platform where individuals, businesses, and educational institutions can contribute supplies ranging from basic craft materials, stationaries, to essential classroom furnitures.

Through various features, users can effortlessly browse available resources around their areas and claim items relevant to their teaching needs. Teachers Aid aims to alleviate financial strain on educators while promoting sustainability through reuse of unused materials.

Furthermore, the app creates a collaborative network among educators helping them create a good learning environment through shared resources. Teachers Aid is an application that has the potential too help revolutionize resource accessibility and adapt collaboration within educational landscape with its objectives and functionalities.



AccessibleU by Wicked Lieutenants

Team Members

Michael Cutbirth
Dahn Lam
Michelle Bianco
Henry Iraheta
Femi Thompson

External Sponsors/Mentors

Internal Sponsors/Mentors

Dr. Stephanie Ludi

Abstract

As students embark on their journey through higher education, it is essential to ensure that accessibility considerations are at the forefront of promoting transparency and inclusiveness across institutions. Therefore, we have created a cutting-edge website that enables students to discuss the accessibility features and challenges of various colleges and universities.

Our website will be an interactive platform for students to share insights, exchange experiences, and confidently advocate for inclusive practices in higher education. Key features include user-friendly forums, directories of colleges with accessibility ratings and reviews, curated resources on disability services and accommodations, and user-generated testimonials and success stories.

By cultivating a supportive online community and promoting dialogue around accessibility issues, our website aims to amplify student voices and raise awareness about accessibility challenges in higher education. Furthermore, it seeks to drive positive change within college campuses by encouraging collaborative efforts and collective advocacy. Through such efforts, students can successfully contribute to creating more inclusive and equitable learning environments for all individuals, regardless of their background or abilities.

Thank you to Lauren Bradford for her help with the website accessibility.



Team Members

Melis Tasatmaz
Andy McDowall
Sufyan Arshad
Aryan Patel

External Sponsors/Mentors

Internal Sponsors/Mentors

Dr. Jacob Holchstetler
Dr. Stephanie Ludi

Abstract

Fossil is a simplified, user centered Mastodon client designed to enhance the users experience of interacting with social networks. In an era where social media platforms often prioritize use engagement over user well-being, Fossil takes a different approach by focusing on simplicity, user control, and allows the platform to make choices by the user for the user.

The client offers interface that prioritizes essential features while minimizing distractions. Users can effortlessly navigate their timelines, interact with posts, and engage in conversations without feeling overwhelmed by unnecessary clutter. Additionally, the implementation of accessibility settings aims to form a inclusive enviornment for all users. Overall, Fossil's minimalist design ensures smooth and intuitive browsing experience while allowing users to focus on what truly matters most: meaningful interactions with others.



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