




UNT College of **ENGINEERING**

Senior Design Day 2023

Department of

**COMPUTER SCIENCE
AND ENGINEERING**

Senior Design Day 2023



COMPUTER SCIENCE

Senior Design Day 2023

ABET Course Assessment Tool Team 27

Team Members:

Dylan Windebank, Michael Laymon, Ravi Addaguduru, Joshua Marr

External Sponsors/Mentors:

N/A

Internal Sponsors/Mentors:

Stephanie-Ann Ludi

Abstract:

Each term, students and faculty enter data for each course they are enrolled in/teach in the CSE, IT, CE, and CY departments. Around the time when terms are ending, students are provided a link to a survey that asks how well the courses followed the course outcomes. Instructors can compile that received data to produce reports that are given to the Undergraduate Curriculum Committee and the Undergraduate Coordinator so the courses/departments can be assessed under ABET guidelines. The current system is outdated and hard to maintain. The goal is to create a new system to accommodate the changes with a Next.js frontend, .NET backend, and MySQL database.



The project began Fall 2020 and the previous teams have made great contributions. The previous teams include sudo rm -rf, Team 5, Caffeine Overflow, Segfault Wizards, and Infinite Loop. This project will likely continue after Spring 2023.

Auto Paragraph Bounding Box - Null_biters

Team Members:

- Rachael Carpenter
- Aaron Hogan
- Malcolm Morton
- Tomas Ponce
- Chase Golden

External Sponsors/Mentors:

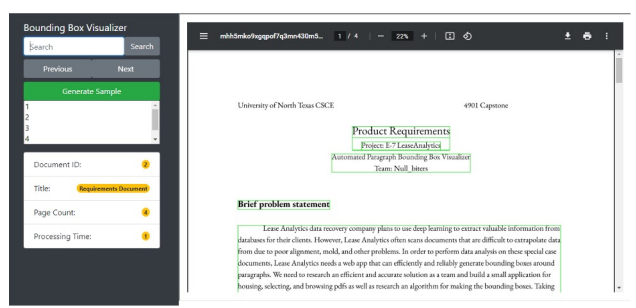
- Lease Analytics
- Jon Kleehammer
- Nathan Sutphen

Internal Sponsors/Mentors:

- None, N/A

Abstract:

The Null_biters team was assigned to create a bounding box algorithm that draws boxes surrounding any paragraphs or sections of text on PDF documents - with reasonable execution time and accuracy. Our algorithm is done by converting PDF pages into images, making the image a B&W color scheme then inverting it, creating & searching for white blobs to draw via dilation & erosion, drawing the bounding boxes around the text in the original image using information from digital image processing, then reverting the image back into a PDF. In addition, the Null_biters team was able to accomplish this by utilizing python code to develop the algorithm and a ruby on rails application to test it on.





Baby Tracker

by Rookie Writers

Team Members:

- Dinh Cao Dat Nguyen
- Jason Luu
- Huy Bui
- Minh Than

External Sponsors/Mentors:

Internal Sponsors/Mentors:

- Dr. Stephanie Ludi, University of North Texas

Abstract:

With the request from doctor Ludi from UNT department of Computer Science and Engineering, we are designing an app that can both run on Android and IOS. Our goal is to create an application to help parents and babysitters to monitor their babies' intake of substance, sleep time and much more. We are using React Native for the UI and UX design and .NET framework and C# for Backend.

Baby Tracker / Time Complexity

Team Members:

- April Eaton
- Colin McCrory
- Kennedy Middlebrooks
- Hung Nguyen
- Cecil Nnodim
- Hien Pham

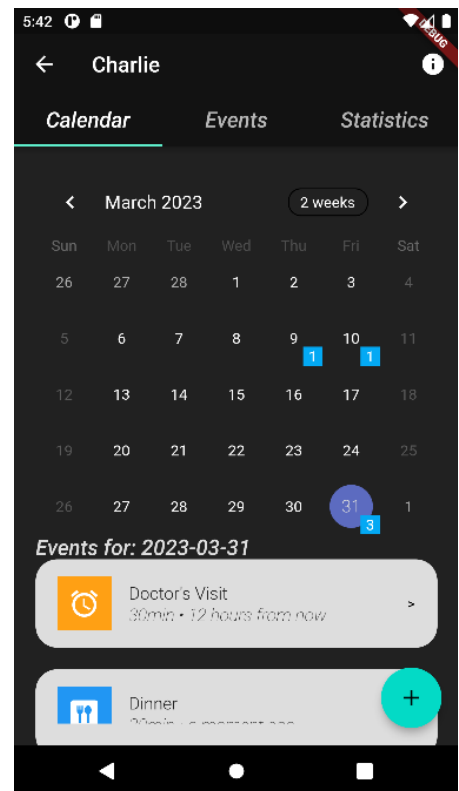
External Sponsors/Mentors:

Internal Sponsors/Mentors:

- Stephanie Ludi

Abstract:

Our baby tracker app aims to solve the problem of a new parent's hectic lifestyle preventing them from easily keeping track of their baby's needs. By being simplistic and focused, stuff like adding baby information, events that have happened, or appointments that will happen is very easy. Navigation and customization is intuitive, and the ability to link multiple accounts to a baby means families can keep up without worry.



BrixColor Finder

Team: Lucky 13



Team Members:

- Garrett Prestidge
- Katherine Aquilone
- Manuel Aragon
- Miguel Hernandez
- Shellie Pham
- Muzhda Wahed

External Sponsors/Mentors:

- None

Internal Sponsors/Mentors:

- Dr. Ludi

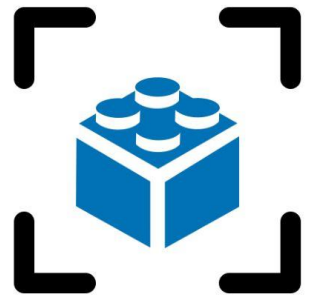
Abstract:

BrixColor Finder is an innovative app that uses machine learning models to empower visually impaired individuals by accurately identifying the color and type of individual LEGO bricks. Developed for both iOS and Android devices, the app enhances the LEGO building experience for users with various visual impairments, promoting inclusivity and fostering social interactions.

While people with visual impairments can enjoy building with LEGOs, challenges in determining brick shape and color may arise due to their impairments. BrixColor Finder addresses these challenges with its unique focus on LEGO brick identification, combined with its use of image recognition technology and LEGO-specific databases. The app is also compatible with phone screen readers, providing a more comprehensive tool for users.

By bridging the accessibility gap in the world of LEGO, BrixColor Finder has the potential to benefit not only visually impaired individuals, but also educators, therapists, and parents working with them.

For our machine learning model that we generated using Teachable Machine, we used an open-source Flutter tutorial project created by Kodeco LLC and integrated it into our project in order to run our model. Here is the URL of the tutorial, but the source code requires a login to access: <https://www.kodeco.com/37077010-tensorflow-lite-tutorial-for-flutter-image-classification>



Brix Color Finder The Missing Semicolon

Team Members:

- Mohammed Abutayyem
- Abdalrahman Alkewaifi
- Massimiliano Celant
- Kulthum Lakha
- Melvin Towo

External Sponsors/Mentors:

N/A

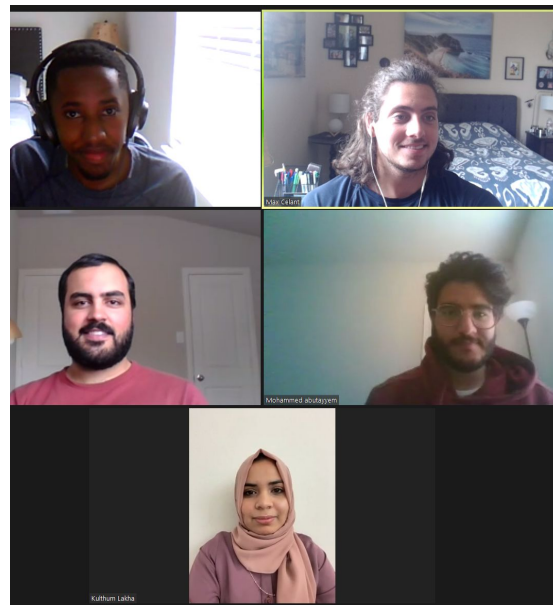
Internal Sponsors/Mentors:

Dr. Stephanie Ludi
Dr. Wajd Aljedaanii

Abstract:

Lego bricks are not only one of the most common toys used by children, but also used by adults who want to unplug from their phones and computers. The bricks come in different sizes and colors that may be hard for visually impaired people to identify.

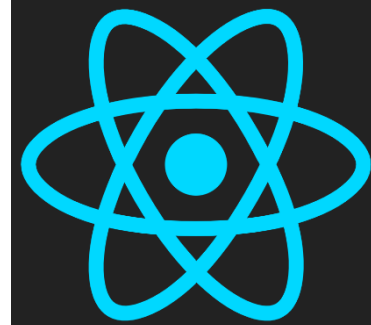
Brix color Finder is an android application that helps visually impaired people identify lego bricks in three easy steps; taking a photo of the block, cropping the photo, and uploading it for processing. The application returns the color and dimensions of the lego brick in text and voice form.



“ codeMe “

Text-to-Code Converter

Team: Full House



Team Members:

Brandon Lopez
Cade Johnson
Sana Alhamad

Ahmed Alrimawi
John (Marshall) Turner

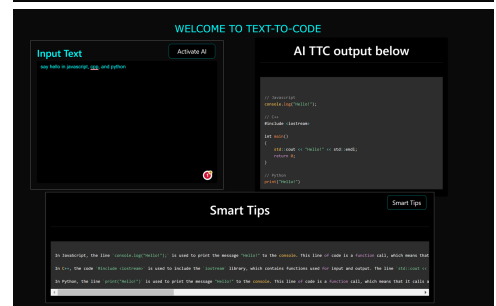
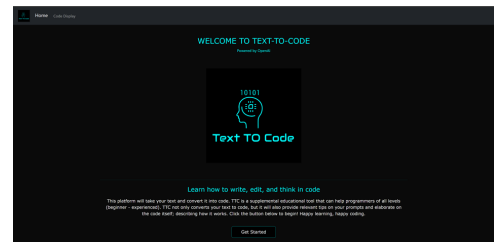
External Sponsors/Mentors:

Internal Sponsors/Mentors:

Wajdi Aljedaani

Abstract:

CodeMe revolutionizes programming education by streamlining the learning experience and helping users overcome coding challenges. Its benefits encompass an intuitive text-to-code translation, making it easier for users to apply programming concepts to actual code, while fostering skill development. The Smart Tips feature offers clear, accessible explanations of code logic and principles, enhancing understanding and promoting deeper comprehension. By encouraging active learning, CodeMe transforms users into informed participants, leading to better retention of programming concepts. Catering to a diverse audience, from beginners to experienced programmers, CodeMe serves as a valuable resource for individuals at various stages of their coding journey. Ultimately, CodeMe empowers users to develop and fortify their programming skills, setting the stage for success in the rapidly evolving world of software development.



CodeStream Studios

Team Members:

- Tyler Adam Martinez, Christopher Gonzales, Jackson Johaneck, Joshua Morgan, Tommy Vu, Henry Peeples, Kyle Sikkema, Isaac Acord

External Sponsors/Mentors:

- CodeStream Studios
- Chandler Lowe
- Emilio Espinosa
- Kyle Foster

Internal Sponsors/Mentors:

Abstract:

CodeStream Studios is a technology-based education company that developed the CodeStream Online Studio, or CSOS. The CSOS editor delivers engaging student experiences in a comprehensive and user-focused environment. Our senior design project focuses on enhancing this editor.

Our senior design team modified the code server by Code (a completely online version of VSCode by Microsoft) repository. We modified the code server to be more kid-friendly by making specific configuration files and the terminal read-only. Students can run their code along with unit tests created by their teacher, allowing them to check the correctness of their code.

Teachers can create unit tests to grade their student's projects automatically. The automatic grading feature aims to streamline the learning process for students while reducing teachers workload.

Overall, our senior design project will improve the quality of education provided by CodeStream Studios and enable teachers and students to have a more engaging, flexible, and efficient learning experience.



CurrenSee

Team Members:

- Gustavo Wences
- Jack Duffield
- Linh Ha
- Bader Shoufi
- Sinikiwe Mapuke

External Sponsors/Mentors:

- n/a

Internal Sponsors/Mentors:

- Stephanie Ludi

Abstract:

Our goal is to contribute ease of life to those who still have cash in their wallet and have a hard time distinguishing between the bills.

CurrenSee will use a phone camera to identify which bill the user has and then communicate the result to the user via voice.

The target demographic for our product include people who are visually impaired whether they are completely blind or have issues with near sightedness. Another demographic that may benefit from the app are those who are not acquainted with U.S. currency.

Our initiative with this app is to provide a currency reader free of charge that competes with similar apps that are already available but are locked behind an egregious paywall.



Discovery Park Pathfinder



Team Members:

Bret Hogan, Brandon Whitney, Joshua Sweeney, Tyrell Richardson, Juan Silvera, Reese Hyatt, Gareth Dade, Noah VanAlstine, Josepha Taboh, Karxyriah Ashley, Ted Ribiro, Chalieta Audreyliya, Jacob Kevetter

External Sponsors/Mentors:

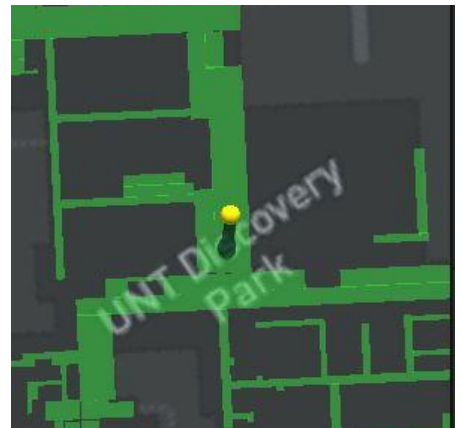
N/A

Internal Sponsors/Mentors:

Dr. Stephanie Ludi

Abstract:

Discovery Park can be challenging to navigate for new students and current students. Due to the layout of the building and the uniformity of rooms and wings, it can take some time to get familiar with Discovery Park. Our goal is to create an application that students can use to navigate through Discovery Park. Using Global Positioning System (GPS) and Augmented Reality (AR), students are guided from their current location to their desired location in Discovery Park. This application is built using the Unity Engine, and pathfinding is done using the A* algorithm. Additional features to the application include a schedule builder and a scavenger hunt.



LEGO Brick Finder

Team Members:

Oriana Borges-Salinas, Ismael Castaneda Villegas, Suzanne Nolba, Dagar Rehan

External Sponsors/Mentors:

None

Internal Sponsors/Mentors:

Dr. Stephanie Ludi

Abstract:

The LEGO Brick Finder app (for iOS) assists visually impaired people in identifying the color and type of LEGO bricks.

An image must contain only one LEGO brick for the app to identify its information accurately.

The information presented on the LEGO is the colors and parts with precise naming (e.g., Dark Green 3024 brick).

In addition, the app is also compatible with Voice Over and Voice Commands, allowing for dynamic interaction with users.

Furthermore, a glossary allows users to index specific bricks per their needs.

LEGO[®] MINDSTORMS[®] Brick Locator

Team 11

Team Members:

- Emmie Abels
- Daniel Koelzer
- Mya Miller
- Lori Keeland

External Sponsors/Mentors:

Internal Sponsors/Mentors:

- Dr. Stephanie Ludi

Abstract:

The LEGO[®] MINDSTORMS[®] Ev3 kits are hands-on cross-curricular STEM solutions for students ages 10 and up. These kits include many small pieces that can be hard for users to identify.

The LEGO[®] MINDSTORMS[®] Brick Locator aims to provide support while building robots in the LEGO[®] MINDSTORMS[®] Education Ev3 Core Set and LEGO[®] MINDSTORMS[®] Education Ev3 Expansion Set. Using machine learning, the app identifies the LEGO[®] bricks and relays the location of the brick to the user. The app makes building the robots more accessible for people who are visually impaired or any user who wants help finding the correct brick.



LML

Team Members:

- Abrielle Williams
- Blake Alvarez
- David Chacon
- Danny Habash
- David Keeter

External Sponsors/Mentors:

Internal Sponsors/Mentors:

- Dr. Stephanie Ludi

Abstract:

The problem we are working towards is fixing the lack of availability of applications that are geared towards LEGO Mindstorm sets in finding bricks for individuals that are visually impaired, as well as easing and providing convenience for people who are interested in building these sets. We are aiming to create an application to aid in finding a specific LEGO Mindstorm Block in a large pile, as well as identify a single specific piece. This would help streamline the building of Mindstorm Robots and make building projects with Mindstorm Blocks accessible to all.



Meet Me Halfway by Flutterflies

Team Members:

- Amina Opio
- Isabelle Williams
- Jonathan Dominguez
- Ajelet Salinas

External Sponsors/Mentors:

Internal Sponsors/Mentors:

- Dr. Stephanie Ludi

Abstract:

Meet Me Halfway is a mobile app that was created to make meeting up with friends and family easy for both parties involved. With fuel prices rising and time being a valuable resource for many, Meet Me Halfway aims to reduce some of the stress that organizing a meetup may frequently cause.

By the use of location services and GIS technologies, users will be able to input their location into the app and receive an approximate “halfway” point between them and their designated friend. The software can also suggest locations based on what the user wants. Depending on the users needs, the app may suggest various locations, such as a restaurant for meals, an arcade for entertainment, a police station or hospital for emergencies, etc.



MeetMe Halfway / Miners



MEET UP
MOBILE APP

Team Members:

- Bijay Shrestha
- Bipin Bhattraï
- Intisaar Islam
- Samuel Njogo

External Sponsors/Mentors:

Internal Sponsors/Mentors:

- Stephanie Ludi

Abstract:

Our app, aims to provide an efficient and stress-free way for people to arrange meetings with friends, colleagues, or business associates. It eliminates the need for lengthy discussions about where to meet and enables users to quickly find a mutually convenient location. The app uses geolocation data to determine and suggest a list of popular meeting spots equidistant from two distinct locations. Utilizing the user-friendly interface, users can choose from a range of options, including cafes, parks, and other public spaces providing quick and reliable results with just a few taps on the screen.



Neura Studios Web App Kaia & Friends

Team Members:

- Salman Farooq
- Ethan Flute
- Riwaj Mainali
- Kaia Siripanyo

External Sponsors/Mentors:

Neura Studios

Internal Sponsors/Mentors:

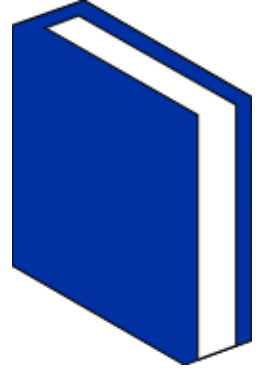
N/A

Abstract:

The Neura Studios Web App is a website designed for the game development company Neuro Studio, which is the team behind “Play Roverse”. The website will showcase the studio’s current and future projects and also function as an application platform for potential game developers.

As the studio currently does not have a single space for it’s games, this web app will serve as an all encompassing brochure that will allow visitors to the site to see many different aspects of the company. These include an about section for the company, photos and videos for showcasing their games, and a contact form.





Open Grader

Team Members:

- Dayton Forehand
- Jackson Welsh
- Jacob Benz
- Julian Garcia-Hernandez
- Kobe Edmond

External Sponsors/Mentors:

- N/A

Internal Sponsors/Mentors:

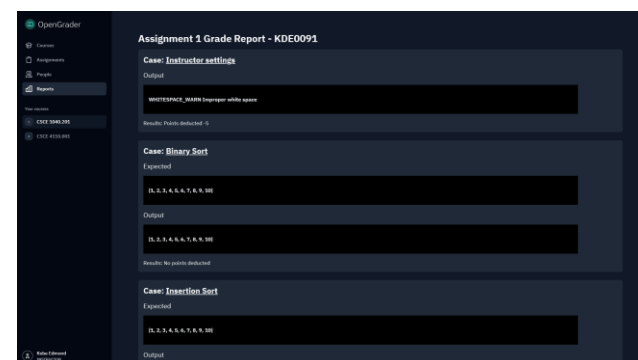
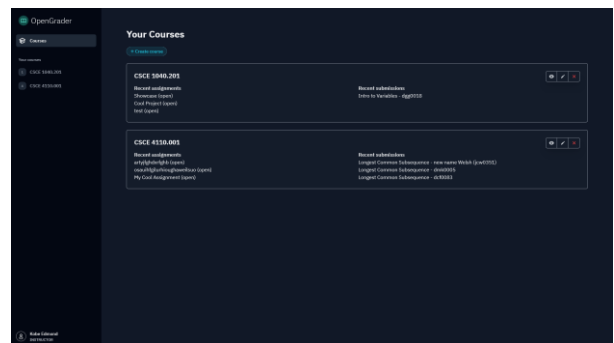
- Dr. Stephanie Ludi

Abstract:

OpenGrader is a web-based tool designed to simplify the task of grading for teachers. The platform allows instructors to automatically assess the code of their students across multiple programming languages such as C/C++, Python, JavaScript, and Java. With OpenGrader, teachers can define multiple test cases for each programming assignment, and the system will automatically run and evaluate the code upon submission.

In addition to automatic grading, OpenGrader also generates reports detailing the performance of each student, including their score and any errors or warnings generated during the evaluation process.

OpenGrader provides a robust and user-friendly solution for automating the grading process, freeing up valuable time for teachers to focus on other important aspects of their work.





OpenGym/WAG

Team Members:

- Pearson Davenport
- Leonardo Grimaldo
- Evan Harr
- Sussie Manovapillai
- Alexander Rohrig

External Sponsors/Mentors:

- OpenGym

Internal Sponsors/Mentors:

- Professor Ludi

Abstract:

The motivation for this project is to incorporate object tracking into the usual training regime of basketball players in order to provide them with data that can improve their performance. This includes optical tracking of the basketball for both shot positional data and “makes or misses”. All this data will drive the person’s training as they look back through a database that includes all stats recorded across multiple practice sessions.

OpenNote — CryptoFolks

Team Members:

- Suleiman Sulaimanov
- Zachary Carpenter
- Natalio Castaneda
- Hayden Lauer

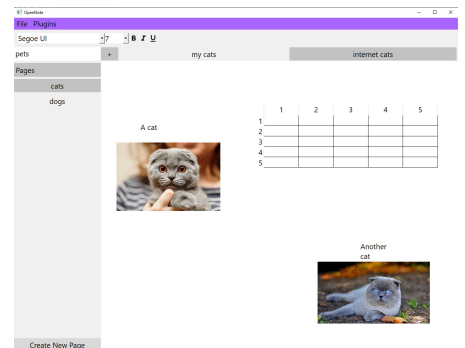
External Sponsors/Mentors:

Internal Sponsors/Mentors:

- Dr. Jonathon Doran

Abstract:

Microsoft's OneNote is a popular application for note-taking. However, being a closed source application, it is practically impossible for the community to make changes or additions to the application. This issue is further amplified by Microsoft's lackluster response to community feedback. Even worse, in recent versions, Microsoft has even removed some features and begun aggressively pushing usage of OneDrive, their cloud storage platform. This raises both privacy and security concerns, as losing your Microsoft account via phishing or data breach grants bad actors' access to all your notebooks. Our solution to these problems is OpenNote, an open-source notetaking application using Python and the PyQt library.



Paw5 - ICTech

Team Members:

- Cody Hogan
- Grae Cathey (Kaitlyn Horton)
- Joshua Thomas
- Noah Johnson

External Sponsors/Mentors:

- None

Internal Sponsors/Mentors:

- Professor: Dr. Stephanie Ludi

Abstract:

As pet owners, we all have an array of applications on our phones to track exercise, diet, vet appointments, and many other things. With all these separate apps, it can be confusing to keep track of things and even tiresome to keep updating things in multiple locations. Paw5 aims to fix this issue by combining these features into a single, all encompassing application.

Paw5 is an app that helps organize all facets of pet ownership, neatly organized into five categories: Health, Map, Community, Services and News. With the app, users will be able to monitor their pets and delve into the pet community around them without having to resort to internet searches. From boarding during travel, finding dog-friendly places to hang out, or even updating your neighbors and friends on information about your pets, Paw5 aims to be the go-to pet app on every pet lovers phone!

 Paw5

Acknowledgments:

Special thanks to our friends and family who helped brainstorm ideas and contributed photos of their pets, as well as our TA, Saba Yousefian Jazi, and Professor, Dr. Stephanie Ludi.

pseudo_coders

Team Members:

- Dennis Byington
- Raven Devore
- Joseph Heffley

External Sponsors/Mentors:

Lease Analytics:

- Tom Agnew, President & CEO
- Jon Kleehammer, Development Lead
- Nathan Sutphen, Senior Developer

Internal Sponsors/Mentors:

- Dr. Stephanie Ludi

Abstract:

Lease Analytics tasked us with building a system that generates bounding boxes around chunks of text on PDF documents. Lease Analytics is building a document management system, and our project is a vital step in their plans of implementing a machine learning algorithm which finds missed opportunities for profit in documents related to oil and gas companies. Our project, Wactz.io, is not the end goal for Lease Analytics, but portions of our project will be integrated into a real web application, which will see business traffic and have real impact on industry. Our project will provide a useful and innovative feature to Lease Analytics' document management system that will hopefully give them an edge over other competing web applications.





RefactoringTutor

Team Members:

- Leif Messinger
- Eric Pasho
- William Rapp
- Austin Carlin
- Jethro Bizumuremyi
- Cadence King

External Sponsors/Mentors:

Internal Sponsors/Mentors:

- Wajdi Aljedaani

Abstract:

The restrictions of the traditional classroom setting lead many young Computer Science students to disregard the cleanliness, maintainability, and readability of their code.

Through informative articles, interactive examples, quizzes, and study playlists, we aim to revolutionize the way refactoring is taught.

Our lessons' interactive code examples are generated by an in-house algorithm. The algorithm separates each potential improvement that could be made to the code, allowing the user to examine each improvement individually. As each improvement is stored individually, the user can examine them in any order they wish.

We display the original and improved code in a side-by-side configuration, allowing users to every combination of improvements themselves to see what changes, without having to navigate back and forth. The user simply hovers over a section of code to see what improvements could be made to that specific section.



Team 25 - *Nobody*

Team Members:

Thijmen Bakker, Michael Laufer, Steven Mathis, Kelsey Porter, Nick Triantos

External Sponsors/Mentors:

N/A

Internal Sponsors/Mentors:

Dr. Stephanie Ludi

Abstract:

Visually impaired gamers have issues playing some of the video games that other gamers enjoy playing. We set out to create a game where the main focus was the visually impaired community. In order to help the visually impaired community play our game, we created an RPG style game where the player can move around the world using spatial sound. On top of that all text in the game has screen reader support so that the player can immerse themselves into the story regardless of level of sight.



Team Brute Force – CloneNote

Team Members:

- Abhiroose, Balayar
- Jofiel, Gomez
- Nazib, Khan
- Jacob, Pham

External Sponsors/Mentors:

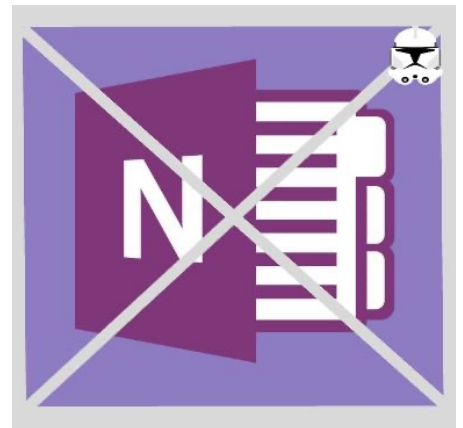
N/A

Internal Sponsors/Mentors:

- Dr. Jonathon Doran

Abstract:

Our project is an open-source desktop application called CloneNote which provides users efficient workflow by implementing a bloat free software with user specific requirements. Dr. Jonathon Doran, our sponsor wanted us to create a OneNote clone that includes everything that makes the free version of OneNote desirable while also including features that are loved in other similar paid applications. CloneNote's innovation comes from it being a cross-platform application that many will have full access to, regardless of their operating system (Windows, iOS, Linux). CloneNote is developed using Python and PyQt5, a GUI toolkit.



Team Five Guys Project Mind-Reader

Team Members:

Zachary Chenausky, Haris Javed, Saad Javed , Clay Lewis, Jigme Rinji

Sherpa

External Sponsors/Mentors:

Internal Sponsors/Mentors:

Dr. Stephanie Ludi

Abstract:

Our goal is to implement accessibility options that enable those who are visually impaired to learn and work in Python with LEGO mindstorms. The tool extends Visual Studio Code's existing accessibility features that will provide a more comprehensive experience for all users.

Through the use of voice commands and aided snippet creation, our extension aims to help new users learn while helping more knowledgeable users to save time. Though our extension will be helpful for sighted people as well, our additions were focused on making the process simpler and quicker for people with visual impairments.

The Visual Studio editor lacks many accessibility features that are required for the visually impaired to work effectively. Our extension is built keeping people with various visual difficulties in consideration, allowing tools to adequately write, edit and debug code. There are not many extensions Visual Studio Code provides that emphasize the needs of such people.





Team Nice Guys: Baby Tracker

Team Members:

- Brandon Castro, Aracely Heredia, Eduardo Garcia, Saul Garay

External Sponsors/Mentors:

- Dr. Stephanie Ludi

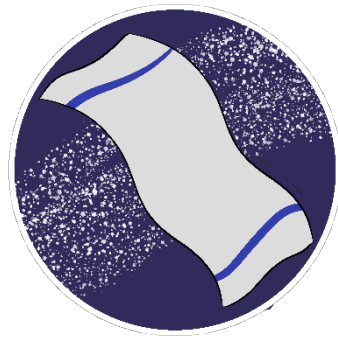
Internal Sponsors/Mentors:

- Dr. Stephanie Ludi

Abstract:

Baby Tracker is an app that will help new and current parents track their baby's health in an easier way. By allowing users to track certain metrics, (sleeping hours, feeding times) parents will be able to see their child grow and see how healthy they are. This will allow parents to track and understand the child's health and make it easier to bring up concerns to doctors during checkups.





Towels Of The Galaxy

Team Members:

- Andrew Jacobson, Henry Legay, Rizwan Laghari, Alan Nguyen, Shijing Guo

External Sponsors/Mentors:

- N/A

Internal Sponsors/Mentors:

- N/A

Abstract:

The goal of this project is to create an application that tracks and displays in a meaningful manner pertinent tasks/information about one or more babies. We need to implement an easy to use application for the average parent, with minimal navigation to track tasks. Additional features required include detailed analysis of user-created tracking instances and an overview of daily inputs with totals of like-instances.

Our team “Towels of the Galaxy” aims to create an easy to use and accessible Baby Tracking Software that gives any parent of an infant child the ability to keep up with their baby’s needs and history in which they can analyze and use to their benefit. We’ve taken careful consideration including conducting studies on other baby trackers as well as conducting interviews with potential users. Each study and interview helped us understand the necessary and quality of life functions of a baby tracker.



UNT Companion App

Team Members:

- Bryan Guzman
- Humza Khan
- Joshua Smith
- Aavinash Doobraj

External Sponsors/Mentors:

Internal Sponsors/Mentors:

- Dr. Wajdi Aljedaani

Abstract:

Entering the University of North Texas can be a challenge for newly arriving freshman, whether students come from the nearby Dallas-Fort Worth, other states like Oklahoma and California, or even halfway across the world. The UNT Companion App aims to help new students ease the transition into this unfamiliar environment featuring: an interactive map of the campus and Denton area; notifications for both UNT and student-hosted events, weather updates, and emergency situations; class tracker; and a forum app. Implemented as a app for both android and IOS devices, everyone from new students and faculty to those returning will be able to discover and familiarize themselves with the University of North Texas and the surrounding Denton Area.



“Wajdi’s Code Refactoring Games!” By Will Code For Food

Team Members:

- Ian Tharp, Colin Fisher, Sakcham Sangroula, Ben Martinez, and Cambry King

External Sponsors/Mentors:

- N/A

Internal Sponsors/Mentors:

- Dr. Wajdi Aljedaani

Abstract:

Our team is funded by Wajdi Aljedaani to develop an educational tool to help with the learning of the topic refactoring. We define code refactoring as improving code step by step while preserving its functionality. This tutoring system will help teach students to refactor functionally correct code. The tutoring system provides automated feedback and layered hints. The overall objective is to allow students who have fundamental programming knowledge to be aware of the qualitative aspects of their programs and teach them how to refactor their programs to make them easier to understand, more efficient, and with the best use of language constructs.

This will be implemented through a web application where students can access their individual data via login and registration. Students are able to track the progress of their learning from their profile dashboard and see visual analytics over their learning. Overall, this application will help provide a fun interactive environment where programmers are able to learn about the benefits and various types of refactoring.





@UNTEngineering

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