Fall 2023 MakerFest Exhibitor Program

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TABLE #: AMST 1-1

THE CLIMATOPIA GAME: Learning How to Build Resilient Communities.

Course: AMST 398

Makers: *Professor Rachel Willis (American Studies), Sydney Thomas (UNC 2021), Alex Pistiolis (UNC 2021), Karla Cordova & Spring 2020 graduate seminar, Fall 2020, Fall 2021, Spring 2022, and Spring 2023 students in AMST 641, 460H, 398.*

CLIMATOPIA: THE GAME is an innovative fabric game and resource backpack for people aged 10-100. Developed with BeAM and APPLES support, the goal of CLIMATOPIA is to share strategies and resources to help plan for, face, and recover from climate change-enhanced water disasters. These disasters include extreme heat, snowstorms, floods, hurricanes, disease, and wildfires. Students have iteratively designed the website, game rules and strategies, board and bag illustrations, and game pieces. Using BeAM training and facilities, they have collaboratively created all the game pieces, board, and curated resource links to produce the fifth iteration of the game for distribution to non-profit environmental centers in North Carolina.

TABLE #: AMST 1-2

CLIMATOPIA Website

Course: AMST 398

Makers: *Julie Henthorn, Daniel Nance, Miles Lindstrom, and Jason Chay*

The website committee curated and designed webpages in WordPress that they later published on CLIMATOPIA's official website. Information on the website includes biographies of all individuals who have contributed to the game, up-to-date resource links about climate change impacts on vulnerable communities, DIY-templates for making the game at home, and the overall process of the game. Their main goal was to increase accessibility of the website and game to advocate for climate-resilient resources.

TABLE #: AMST 1-3

CLIMATOPIA Card Content, Game Design, and Textiles

Course: AMST 398

Makers: *Tiana Dinham, Shaurik Deshpande, Zizhou Lu, Julia Barnett, and Sydney Van Buren*

Using InDesign, Canva, and help from Richard Aillen Taylor, the Card Content committee designed all the playing cards, including the character, info-quiz, and resource cards. The character cards describe the powers held by the game pieces, which represent federal agencies and non-profit organizations that help with disaster recovery. The info-quiz cards contain easy and hard questions relating to climate disasters and recovery, which give players an opportunity to move along the board. Lastly, the resource cards provide tools and strategies to prepare and protect against climate disasters.

The Game Design committee coordinated all game design elements using Adobe Illustrator. They also assisted in ordering custom fabric designs for printing by Spoonflower. This source enables individuals to order one yard of the fabric, sew the game and resource bags, print cards from the website, and use recycled items for markers to create their own Climatopia game.

The textiles committee learned to sew with prototype material designs. Once comfortable with the machine, they later developed modifications to improve the functionality and efficiency of production. Materials sewn included a double-sided fabric board game, a backpack, and a small bag. The board game displays links and a website GRC code to get more recovery resources. The front side of the backpack displays the logo, details, and credits. The back side contains the game rules. Finally, the small bag displays a table of the game pieces, as well as the game,Äôs website. The small bag was designed to hold all game cards and parts and provide a safe way to transport the game.

TABLE #: AMST 1-4

CLIMATOPIA Community Liaisons and Social Media

Course: AMST 398

Makers: *Gabrielle Atkinson, Karina Samuels, Dashanese Carpio Ventura, and Tikiyah Davis*

The Community Liaison and Social Media committee oversaw all communication to outside partners for playing and distributing the game. They also created an Instagram page with pictures and videos of the design process and community excursions. After attending the UNC Clean Tech Summit 2023, they reached out to all organizations and teachers who showed interest in the game. Additionally, under their leadership, Climatopia presented the game at Kidzu on the 13th-15th of April.

TABLE #: AMST 1-5

CLIMATOPIA Laser Wood and Biodegradable Plastic Piece Design

Course: AMST 398

Makers: *Christopher Harper, Nathaniel Kimberly, Pranav Pinapala*

The Laser Wood and Biodegradable Plastics Committee worked on improving the previous design of game pieces, improving production efficiency, and finishing of parts. They produced a environmentally friendly wooden set of pieces on the laser cutter for playing the game. Additionally, they produced a set of biodegradable plastic pieces. Therefore, those playing the game can choose between wood and plastic. Both sets will be included in the game bag.

TABLE #: AMST 1-6

CLIMATOPIA executive committee

Course: AMST 398

Makers: *Sydney Van Buren, Dashanese Carpio Ventura, and Dr. Rachel Willis*

The Spring 2023 cohort operated under the leadership of the Chief Executive Officer, Dr. Rachel Willis, the Chief Operating Officer, Sydney Van Buren, and the Chief Liaison Officer, Dashanese Carpio Ventura. Dr. Rachel Willis oversaw all operations and finalized all executive decisions. Sydney Van Buren worked on daily class emails and general class communication, organizational material, google drive, and other logistics. Dashanese acted as the spokesperson for all working members and met separately with committees to receive updates.

TABLE #: APPL 1-01

The Garden Shelf

Course: APPL 110

Makers: *Nicholas Chow, Sai Kothapalli, Ashton Beckom*

Our Garden Shelf is a multi-level shelf that automatically waters your plants for you. Our shelf has a slick design that can fit in a small space, even in a dorm room. We used the laser cutter, 3D printer, and Vinyl Cutter. We incorporated plywood, electronics, and acrylic. We learned how to utilize the different technologies and we would like our next iteration to include even more technologies.

TABLE #: APPL 1-02

BabyBox (crib/playplace/toybox)

Course: APPL 110

Makers: *Kelleen Cram, Jerry Zhang, Cooper Klein, Kejia Zhang*

The design concept revolves around a versatile crib equipped with an integrated play area and organizational features. Tailored for families residing in compact spaces with young children, the furniture serves a dual purpose. The fabrication process employs various technologies, such as a laser cutter for crafting the box walls and crib fencing, a 3D printer for creating toys, the slide, crib structure atop the box, as well as hinges and essential hardware. Personalization and decoration are achieved through a vinyl cutter, while textiles and sewing techniques are applied to baby-proof the crib rails, mattress, and showcase organizational elements using repurposed fabric. The project's stretch goals include the incorporation of repurposed items and the integration of functional hardware, enhancing both sustainability and functionality.

TABLE #: APPL 1-03

Self-regulated Greenhouse Prototype

Course: APPL 110

Makers: *Johanna Lohmus, Lucky Anne, Ricky Leng*

We chose to make a prototype of a self-sustaining greenhouse with laser-cut wood, acrylic, vinyl, 3D-printed plastic, and repurposed materials. The purpose of the greenhouse is to allow for plants to be grown in areas that cannot normally sustain plant growth outdoors, such as countries with variable climates or insufficient water. The greenhouse regulates itself by sensing temperature and light to control its components, including a moving door and indoor lighting.

TABLE #: APPL 1-04

The Dining Pool Table

Course: APPL 110

Makers: *Justin Li, Arnav Bhatia, James Mccollum*

Introducing The Dining Pool Table, a normal dining table that seamlessly transitions into a stylish pool table, offering a combination of functionality and fun in just one package. We wanted to create a design that offered a two-in-one table for young adults that have limited space inside of their homes and apartments. Pool tables are very large and tend to take up lots of space inside of homes, so we decided to create a piece of furniture that gives users a solution. The sliding top and overall structure of the table is constructed by laser cut plywood, with small pieces of support created using a 3D-printer and a vinyl cutter used for the surface of the pool table.

TABLE #: APPL 1-05

Hand Gesture Car

Course: APPL 110

Makers: *Megan Kopti, HyunJun Ju, JaeGoo Ha, Emmerson Jordan*

Our project is an RC car controlled by a Bluetooth gyroscope. The user holds the gyroscope and when they move their hand, the RC car moves accordingly. The hand gesture car could itself be a toy, or the Bluetooth gyroscope technology could be applied toward moving a larger vehicle or wheelchair.

TABLE #: APPL 1-06

Customizable Desk with Modular Features.

Course: APPL 110

Makers: *Jaitan Singh, Dmytro Vlasenko, Camden Caldwell*

The DNDesk allows users to control their office experience. With a universal attachment technology, the desk lets users connect different tools, backdrops, and technologies they need to be productive. The desk is laser cut and has vinyl stickers for aesthetic purposes. The attachments are 3D printed and laser cut.

TABLE #: APPL 1-07

Mascot head

Course: APPL 110

Makers: *Lama Abed, Bao-Nhi Vu, Megana Duraipandi, Jiawei Cui*

We were thinking of creating an animatronic mascot head. The tools we used were the laser cutter, textiles, 3D printer, and electronics. We learned the iterative process, especially in regard to creating a frame that would universally fit all out members. We also learned about the importance if CAD modeling to ensure an accurate fit. Our next iteration would include more moving parts.

TABLE #: APPL 1-08

Customizable 3D Cat Fidget Toy for College Students with ADHD

Course: APPL 110

Makers: *Cindy Nguyen, Abhilasha Bellapu, Xinze Jiang*

We chose to make a unique 3D cube-shaped fidget toy that resembles a cat. It is designed specifically for college students who suffer from ADHD. The materials and technologies we will be using are the 3D printer, cardboard, laser cutter, the vinyl cutter, and functional hardware like a spring. This innovative fidget toy provides entertainment and tactile stimulation to help students focus and reduce anxiety.

TABLE #: APPL 1-09

Ferris Shelf - Adjustable shelf

Course: APPL 110

Makers: *Connor Basinger, Cecelia Batton, McKayla Pearce*

Our project is a cabinet with revolving shelves to eliminate the problem of being unable to reach things that are too high. This cabinet/pantry allows for better accessibility to the elderly, disabled, and people under average height. It is made out of steel pipes, 3D-printed material, wood, and vinyl.

TABLE #: APPL 1-10

An umbrella functioning lamp with book holder on the base

Course: APPL 110

Makers: *Olivia Eaton, Sarah Kuller, Bella Clucas, Parima Shelat*

My group and I choose our project as it was an idea that we have never heard of, and could be useful. It can function as a two in one book holder with a light for those laying in bed wanting to read a good book. Depending on preference, you are able to dim the light through our “umbrella like mechanism. We utilized the laser cutter, 3D printer and textile tool to make our final project. Through this project, we learned how to execute the training we had throughout the year, and how they can be used together to make a new, inventive object. For our next iteration, we hope to improve the umbrella mechanism to be smoother and easier to use.

TABLE #: APPL 1-11

Automated Bike Turn Signal

Course: APPL 110

Makers: *Chloe Lin, Emily Norman, Runyon Tyler*

We created an automated bike turn signal to assure and increase the safety of bike riders in heavily populated areas. We used a variety of tools including laser cutting, 3D printing, vinyl cutting, and more. We chose this because with rising environmental issues, many people are resorting to bike riding, but that can be difficult in areas such as big cities; not to mention the dangers associated with it. Our hope with this project is to increase the safety of these bike riders and make it more user-friendly to ride around these areas.

TABLE #: APPL 1-12

Solar Cat - Your Sunny Day Friend!

Course: APPL 110

Makers: *Mary Elizabeth Policastro, Alexander Haiss, Khushi Shah, Rohit Thakur*

Our project is a cute little cat that will detect the amount of UV radiation in the area you place the cat in. If there is no sunlight, the cat,Äôs mouth will move to a frowny face. When there there is sunlight, the cat's mouth will move to a smiley face. We incorporated a laser cut structure (plywood), a 3d print mouth, an Arduino breadboard and program to light up the LED eyes and move the mouth, vinyl cut facial features, a solar panel, and acrylic structure around the eyes.

TABLE #: APPL 1-13

Motorized Baby Gate

Course: APPL 110

Makers: *Alana Malone, Abigail Shannon, Sean Murphy, Taylor Llewellyn*

We have decided to make a motorized baby gate that can be operated with floor pedals. It can be annoying and difficult to open a baby gate with your hands full, this makes it much easier and safer. We used plywood and acrylic for the gate, an Arduino and DC motors to operate the gate, a 3D printed box to hold the Arduino, and vinyl stickers for personalization.

TABLE #: APPL 1-14

Courtesy Curtain

Course: APPL 110

Makers: *Camden Mavropoulos, Christina Pickett, Mulang Shi, Anna Brown*

Oftentimes when using dressing rooms in small stores, there is no door. The only separation between you and the world is a thin piece of hanging fabric. To combat this issue, we intend to design a changing room with a fabric door that visually displays the occupancy of the dressing room. Sewing Machine: The door will be made out of fabric, allowing for easy opening and closing, while still conserving space. This fabric will consist of multiple pieces sewed together in a sleek fashion. Laser Cutter: The structural aspect of the design will consist of plywood cut via the laser cutter. This plywood will serve as the foundation to the design, holding the fabric and electronic in place. Electronics: The electronic aspect of this design is two LED lights. They will be used to signify when the room is occupied via the completion of an electrical circuit when the fabric door is closed.

TABLE #: APPL 1-15

BlindSight

Course: APPL 110

Makers: *Sloane Brodie, Anisha Musti, Daniel Ramsgard, Alex Sieni*

The world has left the blind behind. While the 21st century has seen tremendous progress in computation, automation, medicine, energy and more, there has been no change in tools for the blind. Today, the most popular tool for the blind remains the walking stick, an archaic device invented in the mid-fifteenth century, and essentially unchanged since. Such poles aid the blind, yet raise their own issues by comprising the blind's ability to use their hands and make it difficult to navigate everyday terrain. At BlindSight, we've harnessed modern sensor technology and applied it to a fits-all belt that notifies users when they're nearing obstacles. Our team has discovered the power of electronics applied to hardware through our development process; in future iterations, we are excited to add more features to the BlindSight belt that assist the blind in everyday tasks.

TABLE #: APPL 1-16

Light-Up Christmas Tree Toy

Course: APPL 110

Makers: *Andrej Lozevski, Addie Hart, Arshia Pal, Lily Finkelstein*

Instead of spending up to a few hours setting up and decorating a big Christmas tree in your living room, we built a small Christmas tree that is decorated out-of-the-box, saving valuable time. To make the tree interactive and fun, we added a crank that rotates the tree, turning the Christmas decoration into a Chrismtas toy. Complete with Christmas lights, vinyl ornaments, and festive design, our toy is for those who want to celebrate Christmas with minimal prep time without sacrificing class.

TABLE #: APPL 1-17

Lego Lamp

Course: APPL 110

Makers: *Andrew Galas, Jarissa Molina, Kyle Viteri*

Legos are a popular toy that are fun for all ages, and a lamp that could illuminate light would help people build and unbuild their Lego creations during night hours as well. The types of tools we will use are to include a button, a battery, and a 3D printed form of Legos. In this project, we further learn and utilize inter-disciplinary forms of Beam creation in the form of circuit light and 3d printing.

TABLE #: APPL 1-18

Scale for Weighing Things

Course: APPL 110

Makers: *Briggs Briner, Jake Phillips, Zhihan Gao, Jingxue Liu*

Our group decided to design a scale that can use to weight things. This can be used by anyone that need to know the weight of a thing. We decided to use laser cutting, 3-D printing, and vinyl cutting. The backbone of the scale is made of plywood and cut by laser cutter, there will be a 3-D printed hinge in between the two piece of plywood to make sure they come together and move freely. We decided to have used plates as the scale plates. The plates will be connected to the backbone by yarns. Few weights will be 3-D printed and they weight of each is printed by vinyl cutter and stick to the surface. It,Äôs harder than we thought to make the scale balanced when we created it, and our next goal is to find a way to make the scale more balanced before we put anything on it.

TABLE #: APPL 1-19

The Convertible Dollhouse!

Course: APPL 110

Makers: *Emily Cockman, Paige Pan, Thomas You, Sierra Hullander*

Our group chose to make the convertible dollhouse to provide a more compact play area for children. With the convertible dollhouse, there is no need to have both a toy box and a doll house! With the moving floors and walls, you can both move the walls/floors to the floor to make room for extra toys, and adjust the walls to make any size room you'd like!

TABLE #: APPL 1-20

Frankenstein Candy Dispenser

Course: APPL 110

Makers: *Ella Nichols, Caroline Routh, Rusheek Patel, Jeehong Jung*

We began our project near Halloween, so we chose to make a Halloween themed candy dispenser. We laser cut wood to make the box and used the vinyl cutter and 3D printer to put designs on it. Whie working on this project we learned that using an Arduino was more challenging than we thought it would be. Our next iteration would involve a door to the candy that opens and closes when a button is pressed to control how much candy comes out.

TABLE #: APPL 1-21

Ultimancala

Course: APPL 110

Makers: *Ashley Neall, Mary Doyle, Mridul Uppal, Akshan Sameullah*

The Ultimancala is the ultimate Mancala board game set! Constructed with plywood, this innovative Mancala board features various components to make your gameplay more interactive and organized. Players' marbles - protected within an upcycled bag - designate each player while captivating users. While playing to your heart's content, you can also make your opponent aware of your Mancala victories with the score-keeping box!

TABLE #: APPL 1-22

GoBasket

Course: APPL 110

Makers: *Xi Du, Ziying Song, Cora Vickers, Jackson Scullion*

We introduce the GoBasket, the latest innovation in bike basket technology. We offer a new kind of basket that works with our user's needs in mind. Our basket is designed to GO. It uses quick-release technology to detach from the bike or scooter and go with you. When you're ready to go, just detach the basket from the bike and go. You can also detach the bag from the mount for easy carry or to wash it. You can feel good about using our product because it utilizes repurposed fabrics as a main part of the design.

TABLE #: APPL 1-23

A Tea Lover's Dream Box

Course: APPL 110

Makers: *Isaac Bauer, Emma Rudy Srebnik, Laura Trochanowski, Meitra Kazemi*

Our project is a multi-level tea box that has dividers and labels in the top layer to categorize tea bags and a bottom drawer that has a pouch for loose tea along with storage for other tea related accessories or tools (for example, spoons or strainers). We laser-cut the body of the box along with the acrylic dividers, 3D printed and sewed various accessories for the bottom drawer, and created labels with the vinyl cutter. Through this project, we learned about how diverse the applications of tools such as laser cutters and 3D printers are as well as how to combine hardware with these original cut pieces.

TABLE #: APPL 1-24

Multi-Functional Car Cup Organizer

Course: APPL 110

Makers: *Chuxin Chen, Ziqi Ai, Tyler Jade McMillan, Aryan Shelke*

Our product is a unique solution for drivers seeking efficient and adaptable in-car storage. Inspired by the common challenge of managing space in a vehicle, this project combines 3D printing, laser cutting, and repurposing techniques to maximize the utility of a car's cup holder. The organizer features an extended, stable cup holder, a rotatable bottom for versatile storage, a laser-cut organizer for small items, and a durable 3D-printed clip for secure attachment. Decorative vinyl stickers add a personalized touch. Future iterations would focus on incorporating sustainable materials and enhancing customization options for users.

TABLE #: APPL 1-25

Power Planter

Course: APPL 110

Makers: *Kendall Obara, Claire Kiehl, Claire Macdaid, Jenna Cole*

Lacking a green thumb? Out of space for all your plants? Our Power Plant solves all of your problems when it comes to growing plants. Backed on an acrylic laser cut board, our planter can be hung on any wall. The design is amplified by a 3D sun for light, cloud for water, and pot with removable parts. The interactive display will have sliding and electrical components that are both functional and easy to use.

TABLE #: APPL 1-26

Phone Jail

Course: APPL 110

Makers: *Alexandra Echeverri, Emma Brady, Julie Gu, Donovan Schlekat*

Our intended users are any families who are trying to limit screen time or use taking away as a punishment, or teachers who need to keep distractions out of the classroom. It features a removable cup holder attachment if any individual needs to use it in the car. This is attached by a separate 3D-printed mechanism. The phones themselves are held in slots that are accessible through the top of the box. It will be locked by a small key and lock mechanism with 3D-printed lock hasps. The box will be aesthetically pleasing due to vinyl cut sticker decorations. We will also provide a power bank on the inside so that we can charge phones with it.

TABLE #: APPL 1-27

UNC Chase Dining Hall Themed Board Game

Course: APPL 110

Makers: *Sara Laster, Tal Lucas, Theodore Kuelker, Xiaowen Xie*

We chose to make this project to give alumni a way to reminisce on the “good old days” of going to Chase dining hall with all of their college friends without actually having to go to Chase dining hall. To make this project we used cardboard, plywood, an electronics kit, and a reused filament spool. The tools we used included: a laser cutter, a vinyl cutter, a 3d printer, and an electronics kit. By completing this project we learned the importance of delegating group work. The next iteration would look more professionally made, and it even would include a game box.

TABLE #: APPL 1-28

Eco & Bike "Friendly" Bag Holder

Course: APPL 110

Makers: *Anna Bertz, Zoe Politis, Kenneal Bailey*

The Eco & Bike “Friendly” Bag Holder is a simple solution for the eco-conscious cyclist. Made from earth-friendly materials, this nifty accessory easily clips onto your bike, putting an end to disposable bag waste and car emissions. It’s the no-brainer way to be kind to the planet while you pedal.

TABLE #: APPL 1-29

Themed Color-Changing Lantern

Course: APPL 110

Makers: *Kevin Chen, Harshi Jain, Nidhi Padala, Keyana Gutierrez-Gurule*

This product is a laser-cut wooden, themed lantern that contains a color-changing light, illuminating its surroundings. This themed lantern contains several diverse features and unique designs, such as interlocking hinges, plenty of vinyl cut stickers, and 3d printed mini-figurines that elevate the festivities. The front can also be opened with a handle so you can adjust the light.

TABLE #: APPL 1-30

The Complantion

Course: APPL 110

Makers: *Diya Joshi, Caden Ryan, Christina Borromeo, Yunus Mouline*

We chose to make a self-watering pot, which incorporates the laser cutter, 3d printing, the vinyl cutter, and some hardware. This product is intended for people who tend to be busy but would like to have a green thumb. The hardware, a moisturise sensor will indicate when the soil is dry and needs water. Then a 3D printed accessory will light up (by an LED light), and with a motor and outside supply of water connected to a pipe, the water will travel through the pipe to automatically water the plant.

TABLE #: APPL 1-31

Majestic Modular Mobile

Course: APPL 110

Makers: *Taylor McDermott, Emily Hernandez, Aidan Kim, Gabriela Barros*

We are creating a mobile (the spinning thing that hangs over a baby's crib) and are planning on integrating 3D-printing, laser-cutting, and vinyl stickers. The mobile will be innovative in the sense that the components hanging from the mobile itself will be unique and self-designed. Furthermore, the mobile will include features (such as black-and-white/high contrast hanging components) that cater to the unique fascinations of a baby. Babies will enjoy looking up and playing with the hanging components of the mobile.

TABLE #: APPL 1-32

The KickBack

Course: APPL 110

Makers: *Keven Bahena, Blake Seigler, Jaybron Harvey*

As passionate sneakerheads, we've always wanted a piece of comfortable furniture to complete my house. So we created the KickBack, a revolutionary chair with silhouettes of the Air Jordan 4 as the sides that can recline and light up at the press of a bottom, creating a serene environment. The main structure of the shoe is made up of wood and acrylic cuts, decorated with vinyl cuts, and made functional with Arduino hardware. As our first project, we all learned how to use the various technologies and blend them. Our next iteration would be larger, have more reclining features, and have an implemented speaker.

TABLE #: APPL 1-33

studio ghibli inspired automata

Course: APPL 110

Makers: *Elise Shawen, Amit Ariely, Karissa Hoover, Oluwatumininu Oguntola*

We chose to make a Studio Ghibli-inspired automata due to a mutual admiration for the movies and an interest in making a moving product. We used laser-cut wood, motors, bevel gears, lights, and 3D printing to make the automata box. We learned different aspects of hands-on work, such as the physical creation of a working mechanism, as well as programming in order to make the lighting and automation of the box work. Our next iteration would take the detailing of the box to the next level in order to fully immerse users.

TABLE #: APPL 1-34

a multifuntional phone holder of the bicycle

Course: APPL 110

Makers: *Siyuan Liu, Jiang Wei, Amelia Heide, Jocelyn Johnson*

We found that it was too large and vision-blocked for traditional phone holders. For this project, we used wood and plastic in 3-D printing and the technique of vinyl cutting to finish the project. For the next iteration, we need to make it lighter and smaller and make it with more functions.

TABLE #: APPL 1-35

Wind-up Car

Course: APPL 110

Makers: *Dylan Tilley, Ethan Rayala, Fransaya Sio, La'kivonia Apple*

Our assignment was to make a multi-material product with moving parts. For this, we created a wind-up toy car with functional lights.

TABLE #: APPL 1-36

Cable Organizer Made with Fabric, 3D Printing, and More

Course: APPL 110

Makers: *Shriya Nanugonda, Jacqueline Wu, Noah Davis, Giuliano Finizio*

For our APPL 110 project, we were tasked with leveraging a number of the tools and resources available at BeAM to design and create a solution to a problem. A problem faced by many, not just college students, is the effective organization and transportation of charging cables. So for our project, we have designed a foldable, portable cable organizer using vinyl cutting, sewing, and 3D printing. Our cable organizer will be made from sewn fabric, featuring vinyl cut stickers for aesthetics. The cable holder, and the button the secure the organizer once rolled up, are 3D printed.

TABLE #: APPL 1-37

The Snackable Water Bottle

Course: APPL 110

Makers: *Aryan Verma, Soumil Goyal, Claire Cai, Ruby Atkinson*

For our project, we created a water bottle with compartments for food to take snacks on the go with ease. It can be attached to your bike and unattached to be carried with the user. Our intended users are those who are often on the go and individuals who may need to carry snacks or medications with them for health-related reasons. We used a 3D printer, a laser cutter, and a vinyl cutter to create it.

TABLE #: APPL 1-38

Water Bowl with Refill Alerts for User Notification

Course: APPL 110

Makers: *Mckenzie Akbari, Wells Hollidge, Lauren Kranis, Yuzhe Liu*

What sets our product apart is its focus on accessibility and independence. Our system removes the barrier of visual cues, making tasks that rely on them less challenging for visually impaired individuals and enabling them to take care of their pets with greater autonomy The system's core feature is an audible notification mechanism, triggered by a laser sensor monitoring water levels. The system is composed of two parts: the water bowl that the pets drink out of and a water tank that hovers above the bowl. The tank enables users to fill up the water more conveniently and with reduced frequency.

TABLE #: APPL 1-39

Multifunctional Bike Mount

Course: APPL 110

Makers: *Camila Menendez, Ishan Bheda, Jungbin Choi, Nathaniel Nguyen*

The ROAM mount is a basket-like item that will be able to clip onto the front of any bike and hold the rider's phone, drink, and trash. The drink holder will keep track of the temperature of the beverage and indicate via LED to the user and let them know if their drink has gone cold. The trashcan will also include a swivel door that will stay in place so trash cannot fly out while riding. This product is meant to combine all of a biker's necessities into one, so instead of having a separate phone mount and water bottle holder, it's all in one place! We will be using the 3D printer to create the actual base of the mount, the electronic board to create the temperature sensor, and the vinyl cutter for the logo decals.

TABLE #: APPL 1-40

Sunlamp Clock

Course: APPL 110

Makers: *K. Cabell MacMillan, Caroline Lake, Joserth Salas, Kameron Thomas*

We created a "sunlamp" that slowly increases the output light intensity at a set time in order to wake a person up in a healthier manner than a noise-based alarm clock. It incorporates an Arduino Uno (or similar product) to keep track of time and to control the voltage of the LEDs. The housing is a mix of laser cut wood, acrylic, and PLA to diffuse the light. There is also a clock included in the center made out of an old hard drive, and vinyl cut aesthetic designs.

TABLE #: APPL 1-41

Ultimate Desk Organizer

Course: APPL 110

Makers: *Grant Bennett, Corinne Drabenstott, Enis Sevim, Muhammad Fouly*

Our project is a desk organizer to help the everyday college student. We chose to make the desk organizer because we wanted to create something that we would actually use and something there seemed to be a need for on campus. One thing we learned when making this project was the importance of having multiple designs and to keep on working on the design because there is a good chance that it will not work the first time.

TABLE #: APPL 1-42

Chess Board with Pieces

Course: APPL 110

Makers: *Joshua Dendy, Ethan Stutts, Amy Cherian, Nithya Golla*

We choose to make a chess board with chess pieces so we can play chess at any time. We used a laser cutter to make the chess board, we used a 3d printer to make the chess pieces, and we used a vinyl cutter to make the patterns on the chess board.

TABLE #: APPL 1-43

Cat Basket

Course: APPL 110

Makers: *Chethana Madireddy, Varnika Kasu, Kyle Chan, Monserat Garcia*

This cat basket is a multi-functional attachment to a bike that can serve as a carrier for your cat or hold any objects you need securely when going on a trip. It uses laser-cut wood, 3D-printed latches and a gardener bender, vinyl stickers, and hand-sewn pillows and stuffed cat to bring the idea to life. Our group learned of various tools in BeAM and how to integrate many parts together.

TABLE #: APPL 1-44

Ready! Set! Race Cars!

Course: APPL 110

Makers: *Mya Tharp, Kyle Park, Lydia Stranathan, Alec Hughes*

Our race car track has been made to cater more towards older children who have a soft spot for race cars. We wanted to make this so kids would have something to enjoy while also learning by having to put the puzzle pieces together in order to play with their track. We laser cut our track, 3D printed our cars, and vinyl cut our designs for the cars.

TABLE #: APPL 1-45

Model airplane toy with a Runway

Course: APPL 110

Makers: *Clara Oden, Mackenzie Gilmore, Ziheng Wang, Jiaxing Wang*

The product that we will be creating is a model airplane toy with a runway with which it can "take-off" from. The airplane will be able to insert into the center of the runway so that it can move down it and take-off. The intended user of this project is either airplane enthusiasts or children. If used by airplane enthusiasts, the product can be used as a way to display their favorite airplane models in a unique and interactive way. If used by children, the product can be used as an interactive toy, as it will feature lights and a way to have the airplane take-off. The technologies that we will use to create this project include the laser cutter, the 3D printer, and electronic circuits. The laser cutter will be used to create the runway. The 3D printer will be used to make the model airplane. The electronic circuits will be used to add lights to the edges of the runway. By creating and modeling this project we learned about using different types of materials and tools to create something exciting and unique.

TABLE #: APPL 1-46

Sensitive and Portable Lamp

Course: APPL 110

Makers: *Karen Li, Ananya Kompella, Olivia Cole, Zimu Guan*

We will be creating a square lamp that features designs on 4 sides to allow the light to show through. The lamp can also serve as a timer, intended for those who are busy and don,Äôt have their phone on them but need to set a timer for ex: cooking, studying, etc. This can be helpful to those with sensitive hearing, as the lamp will simply blink when the timer is finished instead of setting off a loud noise. The lamp is also portable, and will be able to be hung up or put on its base. The product is intended for a busy student who is on-the-go most of the time and can utilize the portable and small nature of the product. The usage of a 3D printer, laser cutter and Arduino systems were used to efficiently and successfully make this project.

TABLE #: APPL 1-47

A snoopy wonderland storage box!

Course: APPL 110

Makers: *Reem Fayyad, Ashley Earl, Kasey Smith, Lorelei Byrd*

As the holiday season approaches, we set out to design a versatile device that not only serves multiple functions but also doubles as a decorative centerpiece for every home. Introducing the Snoopy Winter Wonderland Box, a project that brings together the precision of laser cutting, the creativity of 3D printing, the ingenuity of Arduino kits, and the finesse of vinyl cutting. Throughout this journey, our collaborative efforts have taught us valuable lessons in teamwork and efficient project organization, crucial for assembling the various components of this intricate device. Our initial steps involve the creation of Snoopy characters, the box, and the ice rink. Subsequently, our focus will shift to the intricate decorative elements and the incorporation of captivating lights to enhance the festive ambiance. Stay tuned for the next iteration as we bring this holiday masterpiece to life!

TABLE #: GEOG 1-01

A 3D Exploration of the UNC Campus

Course: GEOG 115

Makers: *Tyler McCune, Parker Prysiazniuk, Dries Raets*

Our project is a 3-D printed map of UNC's campus. We chose to create this map because we wanted our subject to involve something relevant and familiar to us as students. Our goal in creating our project was to provide new students and/or people that are unfamiliar with the area with easily comprehensible information about the various locations and buildings in Chapel Hill and to provide the opportunity to learn and interpret the map both visually and tangibly. In completing this project, we learned that there are a multitude of factors to consider when creating a map and choosing how to display data.

TABLE #: GEOG 1-02

Interactive map kit of the United States

Course: GEOG 115

Makers: *Parker McConnell, Eric Rash, Juniper Amaranto, Vahan Dvoyan*

Our goal was to create a map that is both 3D and interactive. In a study published in the National Society of Medicine, researchers found that the senses work together to form memory much more intimately than previously realized, thus proving that a multi-sense approach to learning is beneficial for information retention. The Learning Kit aims to utilize the sense of sight and touch to improve learning and memory retention of the geography, topography, and ecology of the continental United States. We used a mix of 3D printing and laser cutting to create our project.

TABLE #: GEOG 1-03

Charlotte, NC Current and Future Railroad Developments Interactive Map

Course: GEOG 115

Makers: *Claire Blackman, Skye Southall, Deeya Pathak, Max Neuwirth*

As all members of the group are either familiar with Charlotte or will be moving to Charlotte after graduation, we thought it would be interesting to focus on Charlotte particularly its light rail and other railway systems since that is unique to Charlotte. Our project incorporates 3D printed elements and laser cutter elements as the main components. We learned how to integrate multiple materials to create an interactive map. To utilize this map in rail stations, we would want to adjust the map to a larger size for people to use and adjust some of the materials to be sturdier.

TABLE #: GEOG 1-04

Interactive cartogram map

Course: GEOG 115

Makers: *Jake Terrill, Spencer Lewisohn, Martin Jones*

We made this as a class project to represent several variables in an interactive manner, such that graduated symbols can be physically held and observed. We picked the counties that we did because we all live in those counties. We used cardboard and the laser cutter.

TABLE #: GEOG 1-05

3D Interactive Topographic Map of Princeville, NC Flood Risk

Course: GEOG 115

Makers: *Grace Hanly, Eli Broun, Owen Furlong*

Our project is a 3D topographic map with accurate labels to pinpoint locations of severe flood risk of Princeville, NC, made with the 3D printer and enhanced by supplementary depictions created through the laser cutter, clamps, and the vinyl cutter. Princeville, NC was established initially as “Freedom Hill,” and was first inhabited by freed slaves. According to the 2020 census, Princeville is home to 1,648 residents and is an area severely vulnerable to and affected by heavy rainfall as it lies in a floodplain. Our interactive map aims to visually illustrate how a concentrated population, 1,091.4 people per square mile, is affected by severe events of precipitation, such as Hurricane Floyd in 1999 and Hurricane Florence in 2018. The interactive aspect consists of reenacting rainfall by pouring water on the map. The benefit of the topographic map could be maximized by the addition of buildings on the three-dimensional map, which is a potential following iteration of the map. Overall, the interactive three-dimensional map has clear labeling and elevation differences which aid in a clear depiction of flood risk in Princeville, NC.

TABLE #: GEOG 1-06

Grandfather Mountain State Park: Elevation Levels, Hiking Trails, Campsites, Peaks

Course: GEOG 115

Makers: *Jasmin Alvarez Martinez, Lesli Ramos, Cobi Henry, Ziying Song*

We chose to craft an innovative multi-layered topographical map of Grandfather Mountain State Park to address the limitations of conventional 2D hiking maps. Utilizing a laser cutter, 3D printer, and vinyl cutter, our map provides a tactile, visually intuitive experience for users. The 3D-printed Mile High Swinging Bridge, peaks, and campsites aid navigation. The vinyl trails and state boundaries enhance visual clarity. Valuable insights from this project include user-centric design, technology integration, and effective collaboration. For the next iteration, we aim to conduct user testing, create an interactive digital version, and engage the hiking community to further enhance the map's usability and inclusivity.

TABLE #: GEOG 1-07

Fire Tower Viewshed 3D LED Model

Course: GEOG 115

Makers: *Bruno Francischine, Jacob Concepcion, Zack Hersh*

We wanted to embark on this project because it can be a useful way to visualize viewsheds of real fire towers in Lincoln National Forest. We used the BEAM Makerspace to print our 3D Models, we built these topographic models by creating a DEM, and we used LED 5mm Diodes for the lighting. One thing that we have learned so far is that things are usually not predictable, and success of projects like these requires flexibility and adaptation to both the design and execution of the tasks. Our next iteration would probably be this on a greater scale, with more land coverage and starker differences between elevation points.

TABLE #: GEOG 1-08

Sporting Venues in the Triangle Area

Course: GEOG 115

Makers: *Jake Rogers, Emerson Elgin, Makenna Dominguez*

As 3 student athletes, we wanted to make our final map project one that reflected our shared interest. We choose to make a laser cut, 3d map of professional and collegiate sporting venues in the triangle area highlighting different areas that you can view sports. This is a great model for navigational purposes and tourist purposes. It is also great for the colleges and professional sports teams as it would make a great piece of memorabilia and would illustrate the diverse sporting places around the area.

TABLE #: INDIV 1-01

Showing off my woodworking projects

Makers: *Dylan Edwards*

I chose to make cutting boards because it is a form of art that requires lots of time and patience. I use just about everytool in the woodshop from the CNC machine, miter saw, band saw, and ddrum sander. I learned to make cutting boards from my associates at Home Depot and from youtubers.

TABLE #: INDIV 1-02

A Quilt for my Friend

Makers: *Alex Martin*

I handmade a quilt for my friend Sophia, choosing warm colors and soft textures that represent our friendship, which has become like a cozy quilt for me. Sophia is planning to move across the country after graduation, and it's comforting for me to imagine them enjoying something I made for them even when we are far apart. Over the countless hours it takes to make a quilt, I enjoy reflecting on the role of quilting and sewing in the maker, fine arts, and crafts movements. Quilting is incredibly empowering; this feminine-coded art can be made sustainably and has the ability to keep people warm for generations. It is the product of skill and care that produces an object that is beautiful, sentimental, and can be used in daily life. This is my fifth quilt, and every time I make a new one I improve so much more. The quilt top and batting are made entirely from scrap or thrifted fabrics which I cut, arranged, and assembled along with the backing fabric. I used a sewing machine, scissors, a rotary cutter, knives, pliers, needles, and my hands to make this quilt.

TABLE #: INDIV 1-03

1860s Corset

Makers: *Katherine Craig*

I drafted and constructed an 1860s corset using historical patterns and techniques. In this process I learned how to grade and alter historical patterns to fit a certain silhouette, as well as how to incorporate sewing techniques from the time period (such as hand-embroidered eyelets) into my work. In the process I learned how to use a modern sewing machine to optimize the painfully time-consuming methods of the era. Altogether, this project taught me many skills that will come in handy in other ventures, and provided me with a valuable glimpse into the past of sewing.

TABLE #: INDIV 1-04

Puzz and Lina, a story-book puzzle

Makers: *Francesca Talenti*

Puzz-and-Lina combines my interests in puzzles and illustrated story books. The first couple of iterations were made of birch bark plywood. To make a cheaper, more accessible version I designed a color variant, made of paper and chipboard. Both versions (plywood and chipboard) were cut with a laser cutter. In the process I learned all kinds of registration techniques. The next color iteration would ideally be made on a professional grade printing and die-cutting machine.

TABLE #: INDIV 1-05

Print Wars: The Force of 3D Printing

Makers: *Eli Fried, Seth Fried, Henry Chen*

Behold as you approach our planet Kamino, where the precision of 3D printing brings the Star Wars universe to life. From wielding a lightsaber to suiting up in clone trooper armor, these life-size relics make the Galaxy Far Far Away feel as close as it gets. May the prints be with you!

TABLE #: INDIV 1-06

a collection of essays

Makers: *Mary Grace Wilkinson*

I have been writing and keeping detailed records of my college experience from day to day this year, and will be presenting my work as an immersive project for makers fest.

TABLE #: INDIV 1-07

Li-Fi - The Next Frontier of Wireless Communication

Makers: *Arya Bharti, Swagat Adhikary, Prajwal Moharana, Pranav Kallem*

Li-Fi, short for Light Fidelity, is an innovative wireless communication technology that uses light waves instead of traditional radio waves for data transmission. Intrigued by the idea of turning everyday light sources into high-speed data transmitters for enhanced efficiency and connectivity, we developed our system using two Arduino boards: one as a transmitter and the other as a receiver. This setup, involving an LED for transmitting light waves and a solar panel for reception, enabled wireless communication between computers without Wi-Fi. Looking ahead, we aim to scale up our Li-Fi technology and consider its integration with existing communication infrastructures to broaden its application and impact.

TABLE #: INDIV 1-08

Custom Antenna & Receiver Unit for Weather Satellite Imagery Reception

Makers: *Nathnael Kahassai*

I chose to modify an existing satellite television dish for the reception of radio signals from polar-orbiting weather satellites. These signals can be processed and decoded to reveal images of the Earth beamed back for meteorologists and radio amateurs' delight. This is made possible at the amateur level by USB software-defined radio receivers that digitally sample analog radio signals allowing for listening to live radio on a computer. Where FM radio reigns between 89 - 108 MHz, at frequencies ~1650 MHz there are real-time signals from orbiting weather satellites. The customized receiver unit replaces the television receiver on the dish, to aim at the small patch of sky the orbiting satellites cover. In making this antenna and receiver unit, components had been 3D printed and fabricated by the metal shop. Additionally, pieces of the antenna wiring had to be soldered using the electronics lab. In the future the integration of the antenna and receiver unit with a Raspberry Pi to handle both the motorized mount control and signal processing, possibly extending to automation.

TABLE #: INDIV 1-09

Skateboard deck press

Makers: *Levi Tox Williams*

Made from some 2x4s, bolts, sheet wood, and two types of foam, my press allows me to turn sheets of maple veneer into a "blank" that is then shaped into a skateboard deck. The first skateboard I made was just a sheet of plywood that I cut to shape, so it wasn't really good. This press has taken the boards I make to the next level by allowing me to incorporate the concave and tails found on typical skateboards. I plan to continue refining the shape of the molds so I can get better geometry in the decks.

TABLE #: INLS 1-01

Delightful Chaos: Anyone Can Make

Course: INLS 690-276

Makers: *Madeleine Roberts*

This multi-modal project leans into a discussion concept from the class "Information Professionals in the Makerspace" - that anyone can be a maker. Prior to taking this class, I did not consider myself a maker; but as the semester continued, my opinion changed. The scene captured in this book nook is me, a happy maker, at home literally and figuratively with new (3D printing, laser cutting) and known (sewing, cross stitching) maker technologies and items around me. The scene is somewhat chaotic, but that reflects my general vibe at home when I am creating, crafting, and writing. My goal is that others can view this scene and realize that they, too, can be makers.

TABLE #: NSCI 3-01

5 senses activity set

Course: NSCI 424

Makers: *Justine Keever, Ava Davis, Ana Diaz, Michelle Tumur, Kejia Li*

This project has been created to teach young children about the neuroscience of the five senses. There is a hands-on activity and a small info sheet for each of the 5 senses. This project has used the 3D printer and the embroidery machine. Future iterations would be more polished versions of each of the activities and a box to keep them all together.

TABLE #: NSCI 3-02

NeuroQuest: A Board Game Teaching the Neuroscience of Memory Through Demonstrations

Course: NSCI 424

Makers: *Husna Kider, Tamera Waters, Ch√© McDowell, Patrick Deloach, Esey Haile*

Neuroscience is not often taught to children, through formal learning or other means, so we strived to create a short, simple way for kids to learn more about the brain. NeuroQuest is a board game that teaches children human memory concepts such as short term memory, long term memory, procedural memory, echoic memory, iconic memory, and more, using interactive demonstrations and mini games. We used chipboard, paper, 3D-printed game tokens, crafting supplies, and other materials for our game and demonstrations. By completing this project, we learned the importance of teaching children about memory so they can form connections and relate neuroscience topics to their own lives.

TABLE #: NSCI 3-03

Action Potential Electrical Puzzle Game

Course: NSCI 424

Makers: *Autumn Griego, Saisha Joshi, Vineeta Pasala, Nick Storch*

Our group made an electrical puzzle game for children ages 8+ to learn about how action potentials pass through a neural network. We used primarily a laser cutter and 3-D printer to make the board and pieces, while using copper tape and LED lights to demonstrate the action potential. As each puzzle piece is added to the board, the next LED light lights up because the circuit up to that light has been completed by the puzzle piece. Our next iteration would include more parts of the neuron involved in action potentials as puzzle pieces.

TABLE #: NSCI 3-04

Neuroscience Board Game

Course: NSCI 424

Makers: *Elizabeth Yates, Graham Williams, Nina Dzidic, Megan Jacobs, Indra Kumar Gottiveeti*

Our group chose to make a board game that teaches kids about neuroscience. We thought that a board game might be an effective way to get kids interested in science while they have fun at the same time. We used a wood board cut with the wood shop materials, paint, blank die, and 3D printed objects. We learned a lot about design and the value of testing while putting this project together. The value of trial and error became very apparent, and we learned so much about how we could improve the design by testing it out with kids. The next iteration would look like a professional game someone could find in a store.

TABLE #: NSCI 3-05

Brain Terrain: Interactive Neuroscience Board Game for Kids

Course: NSCI 424

Makers: *Sophia Hegel, Kristen Guyon, Kathryn Murphy, Yasmeen Elkassem, Shriya Pokala*

Brain Terrain is an interactive board game created for elementary and middle school kids. This activity aims to teach participants about the specific functions of the regions of the brain (frontal lobe, parietal lobe, occipital lobe, temporal lobe, cerebellum, and brainstem) and their applicability to everyday tasks. We created this game as an outreach activity that serves as an introduction to neuroanatomy and function. Participants, which we refer to as “scientists”, move through the game, landing on spaces which ask them to draw a card that contains an interesting fact about the corresponding region and asks them to complete a related challenge. After they complete the challenge, the card will instruct them to move a variable number of spaces forward (1-3 spaces), until a winner reaches the end.

TABLE #: NSCI 3-06

Teaching Neuroscience With a Potential Summing Neuron Model

Course: NSCI 424

Makers: *Brianna Patterson, Varun Indugula, Charles Hall, Shania Mastan, Michael O,ÄôLeary*

Our group created a microcontroller-controlled neuronal model designed for outreach and in-class educational purposes. The model introduces students to the purpose and activity of EPSPs and IPSPs on a neuron, the concept of threshold potential for firing an action potential, spatial and temporal summation, and basic anatomy of a neuron. It primarily involves a 3D-printed model that gives students the option to choose which dendrites and PSPs to add. This mixing and matching allows them to explore the concept of inhibitory vs. excitatory PSPs and what is required to reach threshold potential. We developed this idea based on previous literature suggesting that active, responsive activities for outreach are often the most effective compared to straight lecturing or non-involved activities.

TABLE #: NSCI 4-01

3D Printed Model of SERCA Pump and its Interaction with Novel PAM NDC-1173

Course: NSCI 405

Makers: *Ashley Schaefer, Clara Mellows, Ainsley Cogburn, Sydney Wible*

NDC-1173 acts as a positive allosteric modulator (PAM) to the Sarco/endoplasmic reticulum calcium ATPase Ca2+ pump (SERCA), which is naturally activated by excess calcium and ATP. The SERCA pump plays a role in maintaining calcium homeostasis within the cell by pumping calcium into the ER to remove it from the cytosol. Alzheimer's disease (AD) is a pressing issue due to the fact that it is the primary factor in the progression of dementia. Although AD is extremely prevalent, the treatment options available are very limited and largely ineffective. Since neuronal calcium dysregulation is a common feature in Alzheimer's disease, this PAM is believed to help control cytosolic Ca2+ levels in neurons without as many severe side effects as other calcium inhibitors.

Our project involved designing a 3D-printed model of this interaction of SERCA pump and its interaction with NDC-1173 to allow others to understand positive allosterism as a drug pathway and its pertinence to AD. We developed models using the 3D printing machinery at BeAM over the semester. Through this project, we learned effective modeling skills and how to show complex biological interactions in both an easy-to-understand and accurate way.

Future iterations would include a more accurate depiction of ligand-receptor interactions (more complex shapes to better represent the fit of the ligand into the receptor).

TABLE #: NSCI 4-02

3-D Modeling Drug Binding at the Œ±+Œ≤- Interface of a GABA A Receptor

Course: NSCI 405

Makers: *Melissa Medina, Caroline Hicks, Erica Oake, Sheida Sharghi-Moshtaghin*

We wanted to model CGS 9895, a novel drug, binding to 2 separate sites on the GABA-A receptor. Clinically, this new drug could serve as a GABA-A modulator and produce anxiolytic and anti-epileptic effects. We used 3D-printed filament exclusively from the BeAM Maker's Space to create a model that shows a conformational change upon drug binding. This model will show GABA-A in an open, desensitized, and closed state.

TABLE #: NSCI 4-03

3D model of mGluR4

Course: NSCI 405

Makers: *Paige Cramer, Elise Ray, Meredith Daughtridge, Alina Shcherbakova*

Our project is a 3-Dimensional rendering of a metabotropic glutamate receptor subtype 4. We utilized the UNC Makerspace Ultimaker 3D printer to print our model. The model displays the physical changes in receptor conformation upon binding of a positive allosteric modulator (PAM) and shows how the PAM affects the receptor's physical functionality. The PAM used in this project is ADX88178, a ligand studied by our group extensively throughout the semester. ADX88178 was chosen for its clinical application as a potential treatment for neuromuscular diseases.

TABLE #: NSCI 4-04

Investigating and Modeling the Binding Mechanism between VK4-40 and D3 Receptor

Course: NSCI 405

Makers: *Macy Parmelee, Mohana Mishra, Jessica Sain, Tamera Waters*

Our project is a 3D printed model of the D3 receptor that aims to demonstrate the mechanism of action that occurs when the partial agonist, VK4-40 binds. This novel drug mimics the binding mechanism of cocaine, making it an exciting potential treatment for cocaine use disorder.

TABLE #: NSCI 4-05

3D model showing effect of positive allosteric modulator AMN082 on mGluR7

Course: NSCI 405

Makers: *Rohan Sachdev, Michael Dolschenko, Om Patel*

We made a 3D receptor of the mGluR7 receptor and AMN082 drug to demonstrate the drug interaction with the receptor and illustrate the novel mechanism of the drug. With the help of BeAM Makerspace we made the 3D print of our receptor and drug along with the materials used, such as rope and magnets, to showcase our model interaction properly. To develop this project, we had to research particular receptors and drugs and focused on design sketches several times to build the proper design for the 3D model to print in the BeAM Makerspace.

TABLE #: NSCI 4-06

3D Modeling the Interaction between BMS-986169 and GluN2B

Course: NSCI 405

Makers: *Rohan Kalelkar, Anjali Chandrasekhar, Kenley Yount*

For NSCI 405, we are 3D modeling a drug-receptor interaction that has the potential to be a potent antidepressant. We 3D printed these parts, and they are made out of plastic. This project taught us the details of negative allosteric modulators, and the next iterations would look more accurate and include elements like alpha helices.

TABLE #: NSCI 4-07

3D Model of Sphingosine-1-Phosphate Receptor

Course: NSCI 405

Makers: *Oyeronke Popoola, Hana Kabir, Essie Acquah, Shehzil Abdul Rahim*

The goal of our model is to visualize the mechanism between the sphingosine 1-phosphate 1 receptor, S1P receptor and T cells. Our model will exemplify a perfect fit of the binding between fingolimod and the S1P receptor how the binding to this lymphocyte prevents further inflammatory cell migration to the CNS in the context of multiple sclerosis. We hope this model will help patients suffering from MS, as they are the primary users of this drug. We hope pharmaceutical companies will utilize this model as they would benefit financially from the eventual commercialization of the S1P receptor modulator and drug. The research of the receptor modulator and given drug could lead to other autoimmune conditions being further analyzed and eventually treated for.

TABLE #: NSCI 4-08

Activity of Positive Allosteric Modulator SBI-553 on Neurotensin Receptor 1

Course: NSCI 405

Makers: *Jeremy van Duin, Luke Wykoff, Madison McDowell, Leonardo Alvarez*

This project was done as part of the NSCI 405 Course at UNC in order to have a better understanding of the mechanism of action of a novel drug. Specifically, we modeled the activity of the positive allosteric modulator SBI-553 on neurotensin receptor 1. This model was 3-D printed using UNC's BeAM Makerspace using designs made with Tinkercad. NTSR1 is being researched in relation to substance/alcohol use disorder. The use of NTSR1 modulation is primarily focused on due to its importance in consummatory behaviors and dopamine pathways of the brain.