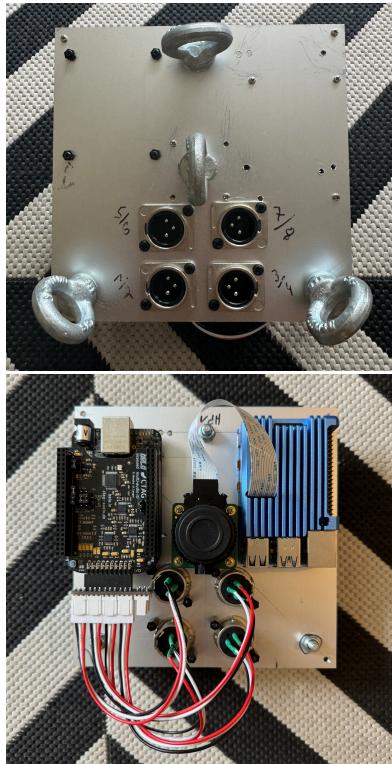


sound installation "swarm of sound" - sommermünze 2024

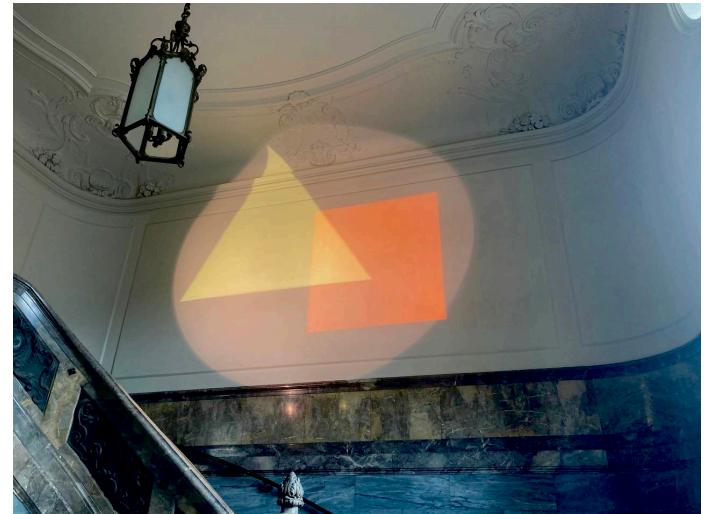
Alte Münze, Berlin



My Bachelor's thesis focused on the conception, development, and realization of an interactive sound installation, "Swarm of Sound". The installation invites participants to immerse themselves in a dynamic auditory environment, where both the sound and its spatial origins are influenced by the movement and collective interactions of those present.

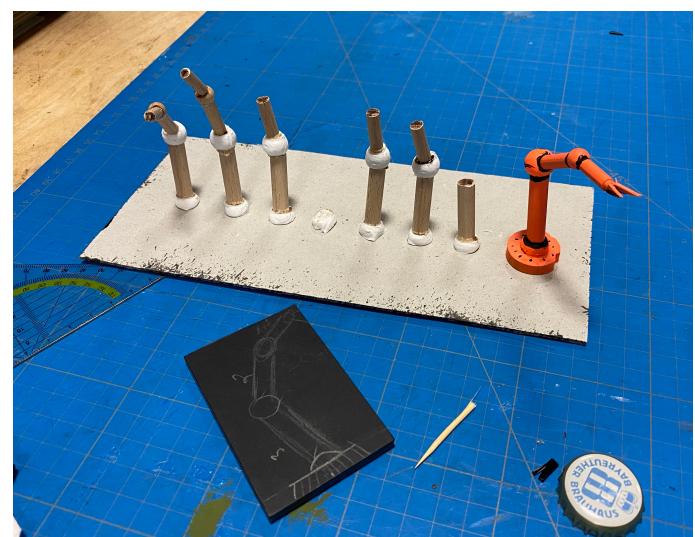
The system operates using two single-board computers. A Raspberry Pi 4 runs a custom camera-based object-tracking algorithm implemented in Python, without relying on deep learning models. Control data is generated through multiple coordinate transformations, converting pixel coordinates to polar and Cartesian coordinates for each tracked object. Sound design, 360-degree panning, and digital-to-analog conversion are handled by the Bela + CTAG sound platform running Pure Data. Communication between the Raspberry Pi and Bela is managed via a TCP/IP network using the UDP transport layer protocol to transmit all control data to Pure Data. For sound reproduction, eight Styrodur boards are equipped with 40-watt RMS exciters powered by an 8-channel Class D amplifier.

Interior lighting installation - Salon Sophie Charlotte 2022 Berlin-Brandenburg Academy for Science



As part of my lighting design course, I worked in a team of 4 to conceptualize and install interior illumination (hallways/entrance/garden) for this annual event. This year's theme, "Life as a Kaleidoscope," was meant to bring scientists, academics, and artists together to reflect on how life can be measured and shaped. We worked within the tight constraints of a small budget and the limited lighting equipment we were allocated to deliver an impactful experience for participants.

Theater stage design - NYOTAIMORI by SAHRA BERTHIAUME



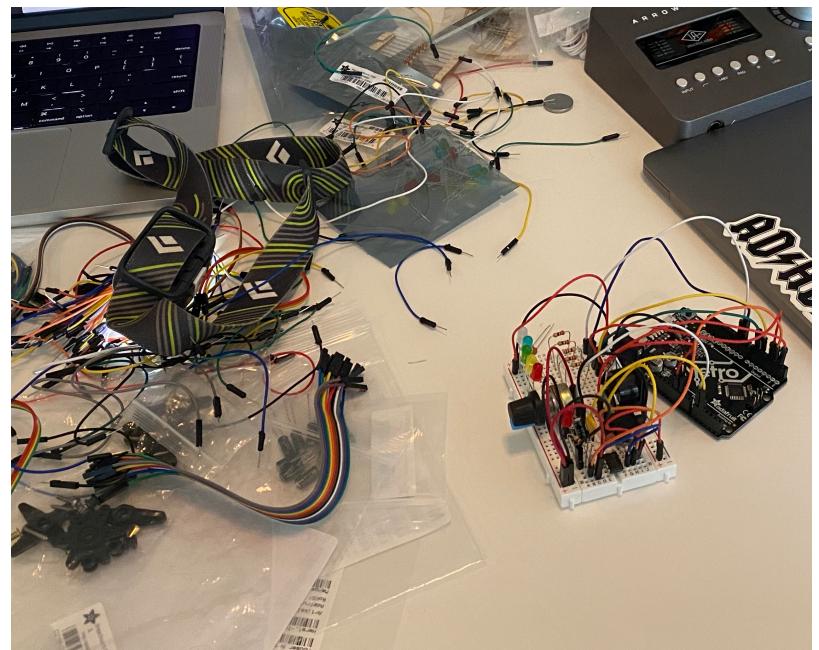
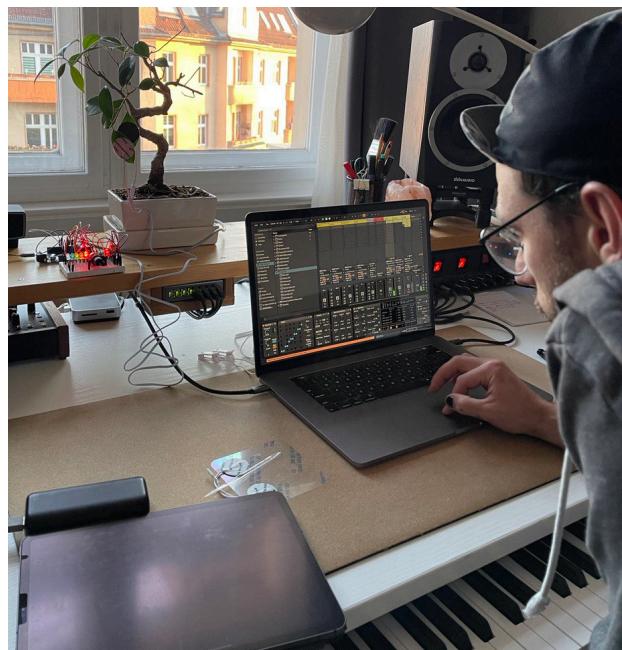
As part of my performance design course, I worked in a group of 4 to develop the stage design and construct a 1:30 stage model. I conceptualized and built the set for one scene. In this scene, the main character, Maude, is transported to a Toyota manufacturing assembly line in Japan through the trunk of car. The play examines the problematic nature of globalization and its consequential exploitation of people through a blending of realism and surrealism. All the worlds within the play are connected by the automobile. To convey the tragic nature of capitalism, I designed a glass coffin to represent the automobile rather than presenting it literally.

Concert stage design - Deichkind



For my design principles course, I worked in a group of 4 to develop a concept and a 1:30 concert stage model for the band, Deichkind. We brainstormed and sketched designs with consideration for the band's aesthetic and edgy lyrics. The band's live performances are chaotic and theatrical so the intent of this design was to provide the band with a "playground" with multiple levels and an interactive platform.

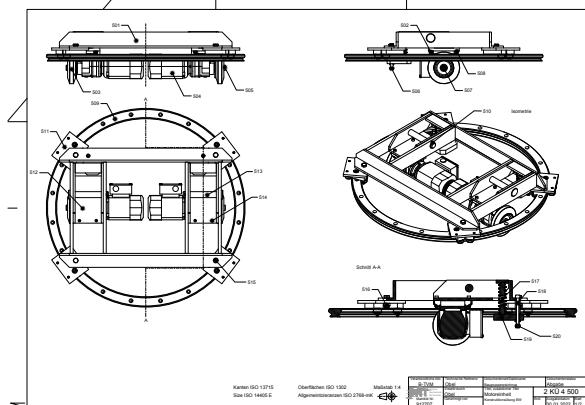
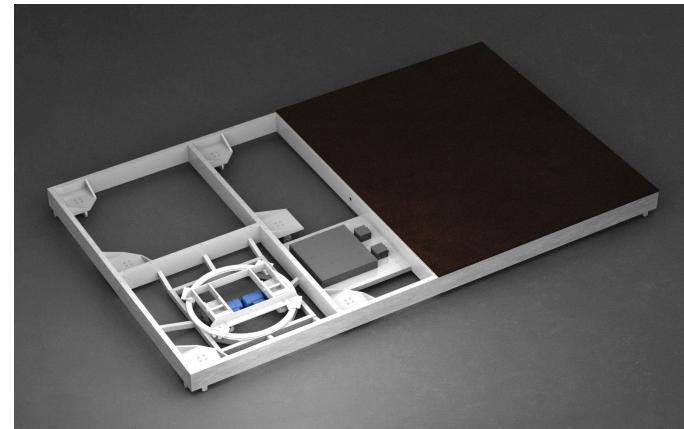
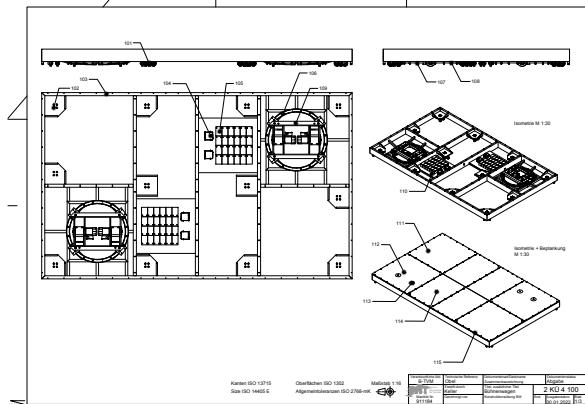
Biodata sonification experimentation



As a personal passion project, I built a biodata sonification device using an arduino microcontroller and electrical components to translate plants' electrical signals into MIDI data to create music. I am experimenting to transform the seemingly erratic electrical signals from the plant into self-generated pleasing musical patterns without further human manipulation.

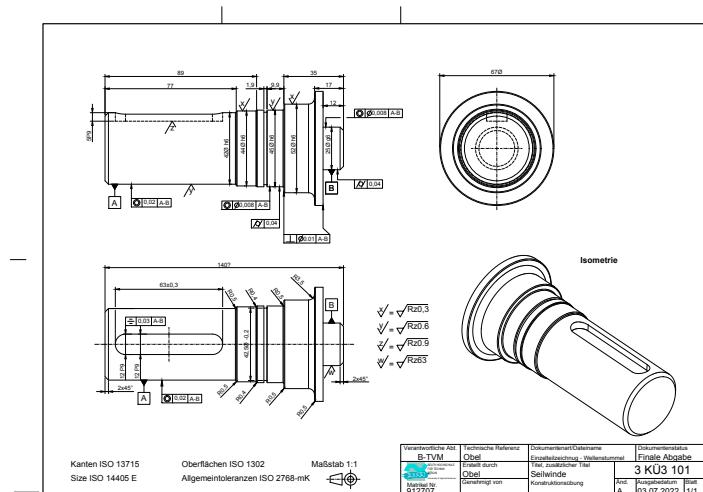
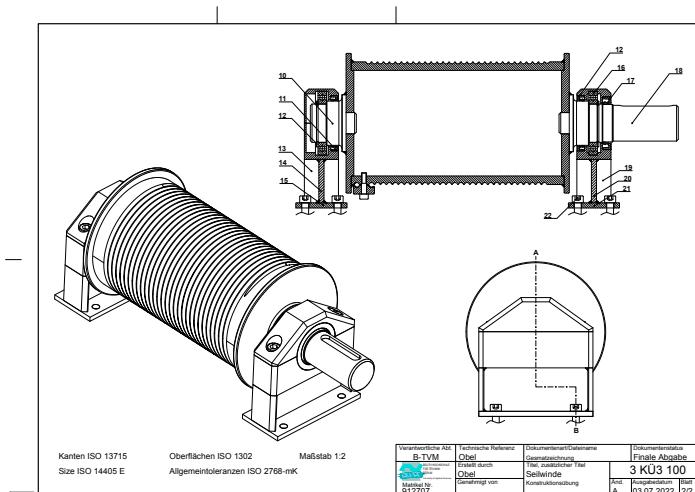


Theater stage cart design with friction drive



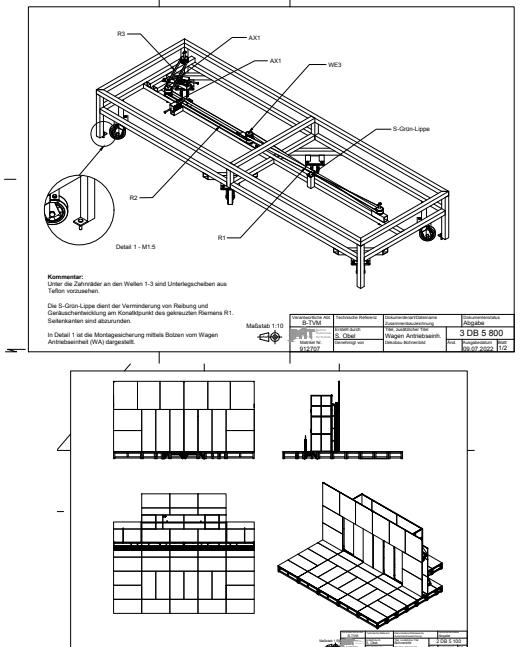
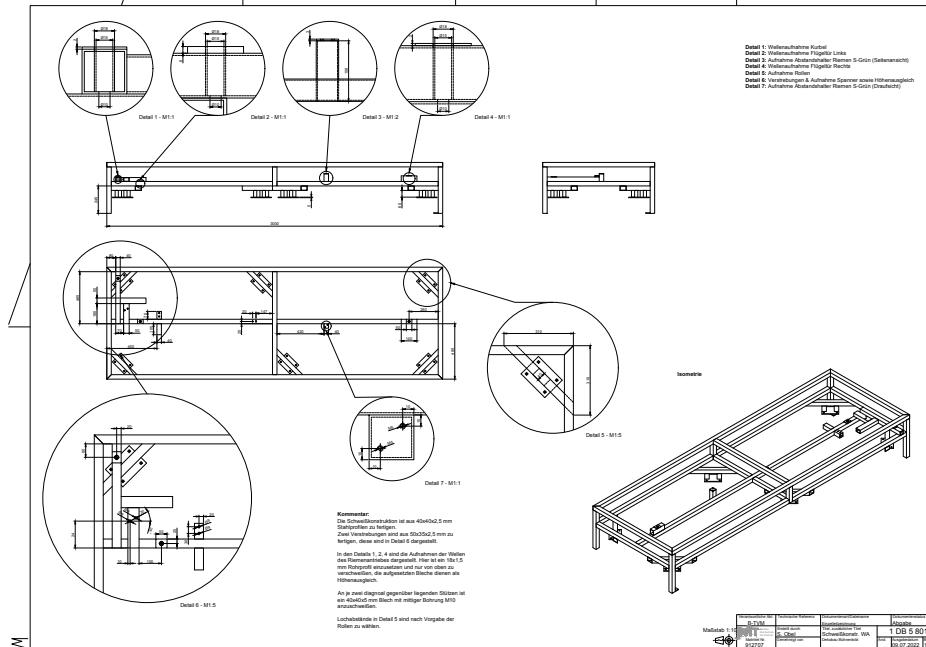
As part of my mechanical engineering 3 course, I was the team lead for a group of 4 to design a motorized stage cart and create 3d model CAD drawings. We had to consider predetermined specifications for the cart's dimensions, load limits, and a required xy 360 degree range of motion. I was responsible for the design and necessary calculations of the motor unit to meet the range of motion specification. I also integrated all the individual designed components by the team into the final 3d model.

Steel wire winch design for a theater fly system

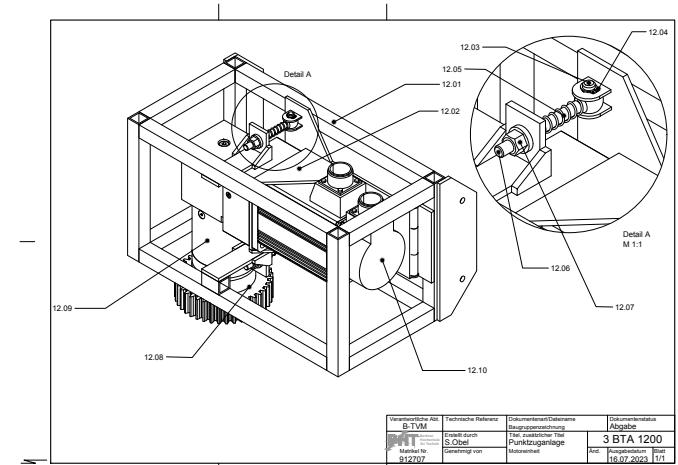
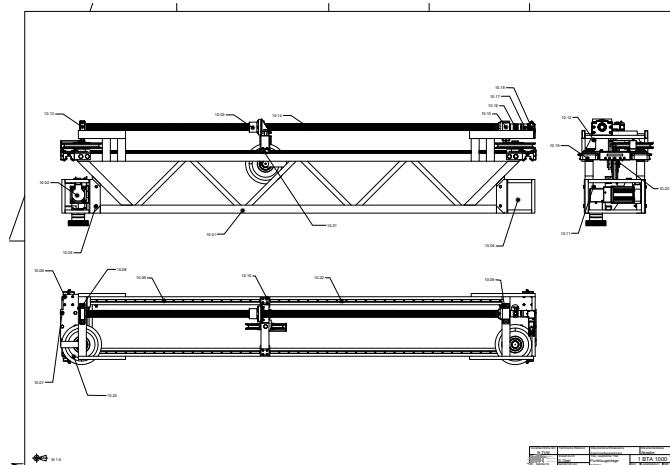


As part of my mechanical engineering 2 course, I designed a steel wire winch for a motorized theater fly system and created 3d CAD drawings. Given specific requirements for wire material, dimension, length, load limits and the individual components' thicknesses, I performed the necessary calculations based on my design concept. One important consideration was ensuring the real-world practicality of manufacturing and ease of on-site assembly of the design.

Workshop drawings for a theater set



As part of my decoration construction class, I worked in a team of 2 to create the workshop drawings for a challenging set design. We designed a proscenium with 6 synchronized sliding doors and hinged doors at the back of the stage for standard theatre walls. I was in charge of designing the hinged doors for back half of the stage. The greatest challenge was perfecting a synchronized opening and closing mechanism for the hinged doors. In my final design, I created a custom steel riser with an integrated belt drive that could be operated next to the door in the backstage area. Two key features were we ensured was that disassembly would not required during the turnover between shows on stage and the design could be combined with standard theater materials, e.g wooden risers.



As part of my mechanical engineering systems class, I designed and dimensioned a automated Point-Pulley System for theatre applications to reach any given point on stage and lift an Entertainment Load Limet of 500 kg. Between 6 Rowes of IPB 600 Steel beams 12 Lifting units schould be deployud with 2 unitet per rowe. To ensure Automated operation movment from left to right handled by Zahnstangen Antrib and Back and vorth with Spindelantrieb.