

Adam Brunner

Individual Contributions

My individual contributions to the Analog & Digital Remote Synthesizer project include working as Project Leader to schedule meeting times and set deadlines for work, lead meetings and take meeting notes, assign tasks to other team members and follow up on progress, and submit all deliverables to be graded as part of the EE/CpE Senior Design courses. In addition to my functions as Project Leader I also took responsibility for performing the analysis, design, and testing for the embedded computing functions of the project, including monitoring and updating of digital controls, configuration of the MCU USB interface to accept and decode MIDI signals, and performing necessary D/A and A/D conversions. I collaborated with my teammates as I progressed with the design, making sure that they were able to work with the parameters my design provided and vice versa.

The aforementioned responsibilities also included to verification of schematic functionality and arrangement of the PCB layout, as well as assisting UA ECE department faculty in the assembly of surface-mount components to the board. I also worked closely with the software manager on our team to interface the remote application that he developed with the embedded components on the synthesizer itself, allowing for remote monitoring and control of various synth parameters. This included the development of WiFi drivers for the embedded system and the configuration of the remote application to transmit and receive data via a WiFi device. Lastly, I oversaw the integration of the various subsystems of the project to produce the final design used for our final demonstration.

Andrew Cihon-Scott

Individual Contributions

I am the Hardware Manager for the Analog & Digital Remote Synthesizer project. I designed the overall hardware architecture for the analog components of the system. This entailed working with the other members of the team, so that I could best understand how the analog hardware could best be designed such that it interfaced correctly with the digital components of the system. I also did the design and analysis for several of the analog subsystems. This included the design of the Voltage Oscillator and associated filter circuitry, the design of the input select circuitry, and volume output circuitry. Additionally, I researched analog methods of creating the reverb effect, as well as methods of vacuum tube amplification.

When it came time to build our synthesizer, Linus and I assembled and tested the hardware subsystems, and worked toward integrating the hardware systems with each other, and the digital potentiometers developed by Adam. This involved constructing the circuits using solder boards, and systemically testing their response utilizing both lab equipment, and an input from a guitar to understand qualitatively how the circuits responded. Finally, I assisted the team in developing some of the software for our synthesizer and developed software to record the output of the synthesizer, to send inputs from the user's computer to the pc, thereby playing recordings back through the synthesizer. The software was also capable of converting a MIDI file into an input the synthesizer could output. Throughout the entire design process, I closely collaborated with other teammates, to ensure compatibility of designs, and to ensure that we all stayed on task. I believe that my contributions were significant, and I greatly helped the team to achieve its goals.

Scott Grisso

Individual Contributions

My contributions to the Analog & Digital Remote Synthesizer project include but are not limited to, working as Software Lead of the team, being the primary programmer on the development of the remote application and helping with the embedded systems programming. Along with working primarily on the remote application and the design and development of the interface and data management, I also offered research, consulting, and advice on the decision of the communications protocols used between the embedded systems and the remote device. To make the project work as a cohesive unit I worked with my teammates to ensure that each individual module of the project would be able to connect, and work together as intended.

When further working on the project, my contributions to the team involved working on the communications, both wireless and wired, between the remote application and the synthesizer. These communications involved working with WiFi Direct as well as other WiFi communications. Another aspect of the communications involved wired communications through serial port communications to allow for easy communications between the remote app host and the synthesizer.

Linus Wright

Individual Work Contributions

My contributions to the Analog + Digital Remote Synthesizer project are primarily in the analog circuitry. I serve as Archivist for our design team, and have the responsibility of saving and maintaining a separate collection of all files for the project in a relatively stable format, as well as taking notes on the team meetings in case the Team Leader's notes are lost or incomplete. My technical tasks included designing and finding appropriate parts for several subsystems, determining which way the signal should flow between all the subsystems, as well as finding the best way to implement a power supply for this project. In regards each of the circuits I did research into which designs were most effective, applied a cost-benefit analysis based on the marketing and engineering requirements we have decided upon, and developed working simulations for each system. Using previous experience, I also offered some insight into various low power communication protocols and worked with our Hardware Lead to develop a working model for both simulating the effects circuits with realistic inputs and estimating the amplitude and frequency range of our input waves.

In the spring semester, I mainly helped my team through building the subsystems themselves and finding workarounds to various problems we encountered before demonstrations. I have built the tone control, reverb driver, and reverb mixer, as well as troubleshooted problems in the original board design to determine what to fix for the final presentation. I am also in charge of testing the final setup once we have everything built and finding solutions to problems we encounter during that step.