

Rose Kitz

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EDUCATION

Bachelor of Science in Mechanical Engineering, minor Music Engineering (Acoustic Instrument Design) May 2024

Tufts University (Medford, MA) | GPA 3.89, Dean's List all semesters

Activities: 4-yr Varsity XC/T&F (Captain '23-24, Most Improved '23, Green Dot & SAAC Rep, NESCAC All-Sportsmanship '23 & '21, Tufts Sportsmanship Award Nominee '24); Mech. Eng. Undergrad. Teaching Award, Tufts ME ABET Constituency Review Committee; Soc. Women Eng. (Exec. Board 3 years); American Soc. Mech. Eng., Tufts Bike Shop (Student Mechanic)

Relevant Courses: [Musical Ins. Design & Manuf.](#), [Electronic Musical Ins. Design](#), Acoustics, Architectural Acoustics, Psych. of Music, Instruments/Experiments, Design for Fabrication, [Robotics](#), Electronics & Controls, Comp. Sci.; Mechanics; Materials & Mfg.; Eng. Design, Human Factors Eng., Public Speaking

University of Pavia; Pavia, Lombardy, Italy; Tufts-In-Pavia Data Science & Italian Program July 2022

ACOUSTIC TEST & MEASUREMENT EXPERIENCE

LabVIEW Software Engineer, Listen, Inc. – specifics of work is under NDA July 2024 - Present

- Code audio algorithms, virtual instruments, and user interfaces for audio/electroacoustic testing software, SoundCheck
- Develop, test, and debug large-scale LabVIEW software as part of Scrum team, inc. to interface with hardware devices
- Collaborate with DSP, hardware, and support engineers to deliver reliable products with our customers in mind
- Methodically document specs/designs, code, and processes to support cross-company comms. and ensure product quality

Acoustics Effects of Sticking Different-Sized Tubes in a Trumpet Bell ([see docs](#)), Independent Project Spring 2024

- Independently designed and conducted unique acoustic experiment within 2-week deadline, under advisor Chris Rogers

Comparison of Experimental, Analytical, and Numerical Spectrum Analysis ([see docs](#)), Course Project (Indep.) Spring 2024

- Adapted my original LabVIEW spectrum analyzer for multi-trial testing, recording waiting, and confidence interval plotting
- Exhaustively analyzed spectral behavior of wooden ruler and different-material straws, comparing analysis methods

LabVIEW Timbre Synthesizer ([see docs](#)), Course Project (Partner) Spring 2024

- Simulated real acoustic instruments with various waveforms of individual frequency, amplitude, and wave type control
- Live recorded sound to compare to simulated FFT, and coded presets to auto-fill the waveform controls for tested combos.
- Integrated filters, playback of simulated sound, and other user-friendly features, all in a clean, one-page UI

LabVIEW Spectrum Analyzer ([see docs](#)), Course Project (Partner) Spring 2024

- Compared live-recorded sound to loudness meter/safety standards, with note detection & tuning, and FFT/waveform graphs
- Simulated un-achievable/unsafe loudness level ranges (without sound) to explore safety levels & equivalent sounds

Auralization and Room Acoustics Characterization of Crane Room ([see site](#)), Course Project (Group) Spring 2023

- Measured impulse response and calculated room parameters in MATLAB, and listened critically to characterize room
- Recommended improvements to room design based on program/use, and verified changes via auralization and Sabine eq.

ACOUSTIC SYSTEM DESIGN & FABRICATION EXPERIENCE

Brass Soprano Trombone ([see docs](#)), Course Project (Indep.) Spring 2024

- Executed end-to-end planning, design, fabrication, testing, and analysis of brass trombone within four months of school
- Sourced & budgeted materials for <\$140 based on extensive brass manufacturing processes research
- Iterated from a bell, to a slide bugle, and eventually the full trombone, to stay on track with “functional instrument” goal
- Dedicated practice time to learn my instrument and compose a piece to showcase its capabilities

Fabrication Specialist, Nolop FAST Facility (Makerspace) at Tufts University Sep. 2022 – May 2024

- [Welcomed and trained community members](#) to use tools safely & effectively; provided advice in the iterative design process
- Maintained & repaired tools, taking initiative to clean & organize the space, track inventory and facilitate store purchases
- Planned & led semesterly workshops (stained glass, soldering) to invite new students/faculty/staff into the community

Helmholtz Absorber (Design, Fabrication, and Testing), Course Project (Group) Spring 2024

- Led physical design and fabrication of 115-Hz Helmholtz absorber with desired min. attenuation of 3 dBRMS for <\$70
- Collaborated with groupmates to test and analyze the build, with subsequent diagnosis & resolution of absorption failure

Custom F4 Marimba Bar Fabrication & Analysis ([see docs](#)), Course Project (Independent) Fall 2023

ELECTRONIC MUSIC DESIGN EXPERIENCE

The Sledgehammer Kablammer ([featured on TuftsNow](#), [see docs](#)), *Course Project (Group)* **Fall 2023**

- Led hardware, software, sensor integration, and mechanical design for interdisciplinary team to design & build an electronic musical instrument from scratch, while debugging data flow from sensors to MCU to MaxMSP to Reason (DAW) to sound
- Consulted with music and engineering psychology teammates on sound and user interface/interaction design

Future Educational Technologies Lab Intern for Chris Rogers, *Tufts Center for Eng. Education and Outreach* **Jul. – Aug. 2022**

- Researched, programmed, tested, and documented methods for playing MIDI sounds over BLE & USB on the SPIKE Prime hub with MicroPython, enabling students to build wireless, sensor-driven musical instruments with GarageBand
- [Programmed a LEGO trombone](#) to play realistic partials based on ‘air’ & slide control (force & distance sensor)

TESTING/DEBUGGING EXPERIENCE

Systems Test Engineering Intern, *iRobot (Bedford, MA) – specifics of work is under NDA* **May - Aug. 2023**

- Rapidly prototyped test fixture/script, collected data, and analyzed results to inform critical manufacturing decision
- Pivoted quickly to take on full-timer’s extra work, independently adapting old system tests for near-production robot, running tests, and documenting both summary and in-depth results to verify updated design
- In testing, found, reported, and followed to resolution two software bugs on time-sensitive software release
- Communicated with technicians to learn hardware/software testing best practices and use of relevant measurement devices
- Designed, built proof-of-concept, modeled in CREO, and prototyped to-scale modules of a new cost-down test fixture for a new product, consulting with product experts and considering durability, cost, modularity, and usability for technicians

Electronics & Controls, Robotics Learning Assistant, *Tufts University Department of Mech. Eng.* **Sep. – Dec. 2023**

- Enabled students to learn to debug robotic systems, design custom PCBs, and design based on component specifications
- Led lab section and office hours to support software and hardware integration for microcontrollers on both Windows & Mac
- Recognized with award from my department professors for outstanding support of students and teaching contributions

SKILLS

Programming: LabVIEW, Python (NumPy, Matplotlib, Pandas), MATLAB, MicroPython, OpenCV, HTML/CSS, R, Arduino

Software: SoundCheck, MaxMSP, Reason, CATT Acoustic, Audacity, GarageBand, Virtual Audio Cable, KiCad, CREO, Solidworks (FEA), OnShape, Comsol (CFD), OnScale, Perforce, GitHub, Agile/Scrum, Jira & Confluence, Adobe

Electronics: MIDI BLE, PCB design, Raspberry Pi, image processing, soldering, Arduino, soft circuits, garden maintenance systems

Fabrication: soldering, brazing, laser cutting, 3D printing, welding, sheet metal, lathe, mill, water jet, woodworking, design thinking

Music: jazz performance/big band/improvisation (tenor saxophone, clarinet), critical listening, transcription, basic piano

Other: Microsoft Excel/Suite, Google Suite, Slack, Notion, Graphic Design, Proficient Spanish, Conversational Italian