

Project Description →

- To develop models to evaluate sounds from HVAC&R equipment
- Current methods of evaluation need improvement
- The engineer can explore system sound design options prior to prototyping

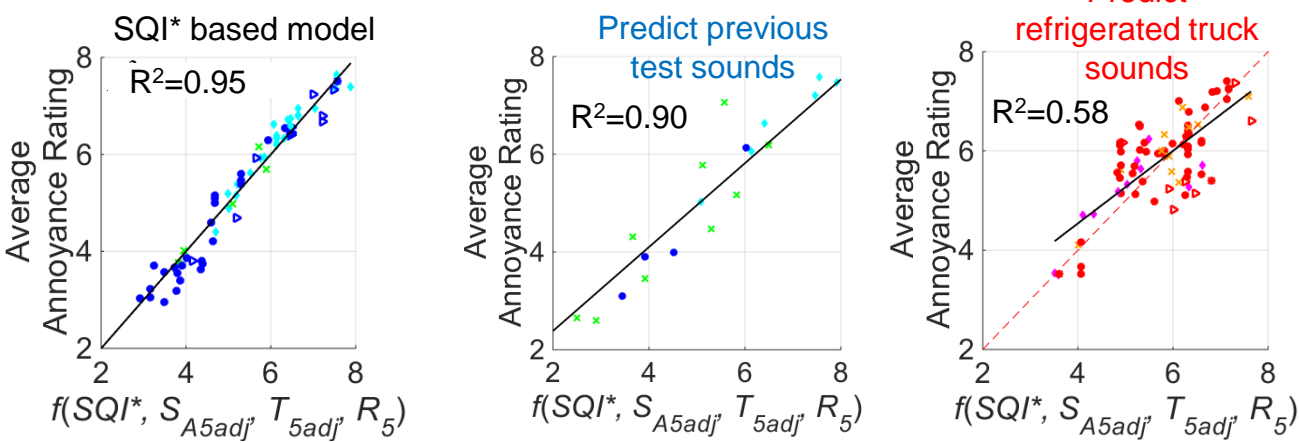
Approach ↓

- Collect recordings
- Analyze signals: spectral analysis & sound metrics – loudness models, weighted sound pressure levels, tonality, sharpness, fluctuation, roughness and sound quality indicator (SQI)
- Examine metric correlation
- Signal modification → increase the variety of combinations of attributes
- Conduct subjective tests: collect descriptors of the sounds, a semantic differential test and rating tests

Discussion

- The sound quality indicator model performed better than the loudness model
- Sharpness, tonality and roughness metric also significant
- Separated annoyance models for residential and refrigerated truck units

← Results



Annoyance ratings are affected by many sound characteristics other than the level of the sound