

## Polygraph Sonification with Earcons

For the Heart Rate's earcon, I have chosen a sound that is played by two alternate piano keys to create a soft tension sound. Since this sound will be played simultaneously with the respiration rate's earcon, I have chosen a flatter sound played by a lower pitch instrument to represent that. This way the user can clearly distinguish the sounds in a way that the two earcons do not contradict one another. The sounds used for respiration rate sounds like a background sound while the heart rate is more distinguishable; however, with few uses the tester can easily distinguish between the two sounds and the interval the respiration rate is played in. For the GSR alert, I choose sounds that resemble a sad/failure sound that one would often hear in a game play. The more emotional the person is, the higher the pitch and shorter the duration of the sound is played. The reason that is not reversed is because we want the person who is controlling this machine to know immediately/in a shorter time interval that the question being asked is too emotional for the subject. The truth alert is a sound that sounds like what you would expect if you get a question correct. It is sharp, concise, and gentle. In contrast, the lie alert sounds like a buzz that sounds in a manner of rejection. Both the confidence level of the truth and lie alert works the same way. The more confidence the machine is evaluating the effectiveness of its judgment, the lower the pitch of the sound is played and the duration is longer to indicate its assertiveness. This auditory interface is best used when the volume for both respiration rate and heart rate is set in 1/3 of its volume capability to allow the subject to talk and for the tester to hear the polygraph's response and the subject's response at the same time. Nevertheless, despite the volume of the heart rate and the respiration rate, the tester can clearly hear and distinguish between the three alerts should they arise. All three alerts have their distinctive sounds and those will not be mingling with the ambient sound channel.