

1. Read the HAT model of the HRTF described in [Algazi et al. 2002](#), (link is also given on the home page)
2. Based on this paper implement a MATLAB function that creates a head related impulse response for any given direction (θ, ϕ)
3. Implement a simple room model involving at least first and second order reflections in a simple cubical room of size $3\text{m} \times 3\text{m} \times 2\text{m}$
4. Create a Matlab function that implements a “composite” room plus head-related impulse response (check the paper by Zotkin et al. === linked off the class page). Note that since we are only considering relatively small room impulse responses, the treatment of the tail of the impulse response is not needed
5. Consider the buzzing bee sound in the file http://www.umiacs.umd.edu/~ramani/cmssc828d_audio/BEE_SHO.WAV
6. Verify that its frequency content is relatively low
7. Move the bee in a path that follows some curve about the head and play the sound it makes.
8. Hear the sound created over headphones for various situations.