PERCEPTUAL REQUIREMENTS OF DYNAMIC AURALIZATIONS IN AUDIOVISUAL ENVIRONMENTS

by

Linda A. Gedemer

An Abstract of a Thesis Submitted to the Graduate

Faculty of Rensselaer Polytechnic Institute

in Partial Fulfillment of the

Requirements for the degree of

MASTER OF ARCHITECTURAL SCIENCES

Major Subject: ARCHITECTURAL ACOUSTICS

The original of the complete thesis is on file
In the Rensselaer Polytechnic Institute Library

Approved:

_____
Dr. Jonas Braasch, Thesis Adviser

Approved:

_____
Prof. Paul Calamia, Co-adviser

Rensselaer Polytechnic Institute
Troy, New York

November, 2008
(For Graduation December, 2008)

ABSTRACT

Acoustic computer modeling and associated auralizations are evolving from static sources and receivers to dynamic sources and receivers as computational speeds allow for faster renderings. Current research has focused on creating highly accurate dynamic models with the hope of producing more accurate auralizations but still struggles with the trade-off between accuracy and available processing speed. The question remains as to how accurate these models need to be and which acoustic parameters are important if the receiver (listener) is moving dynamically through the acoustic model.

The focus of this research was to attempt to define the accuracy and parameter requirements of dynamic models and in turn the auralizations of these models from a perceptual standpoint. Research was also conducted to study the effects of added noise on the perceived plausibility of dynamic auralizations.

The procedure consisted of creating a set of dynamic models with varying modifications in their acoustic parameters and to test these models against actual recordings utilizing a binaural playback method. A subjective evaluation of *perceived* accuracy was conducted with several test subjects of varying ear-training. The level of detail with respect to the acoustic parameters in these models, as well as the effect of added noise, and their relationship to perceived accuracy was analyzed and documented.