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Interfacing Digital Waveguide with CORDIS ANIMA networks

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The aim of this article is mainly to offer a link between the Digital Waveguide and the CORDIS-ANIMA physical modeling formalism. The first one is highly a modular lumped physical modeling and simulation system based on the mass-interaction paradigm while the second one offers accurate and efficient discrete time distributed models synthesized typically by delay lines and scattering junctions, in combination with digital filters. Both of them are widely developed and used in the domain of computer music field by scientists and artists.

Although Digital Waveguide models have already been combined with Wave Digital Filters, they have never been exploited and integrated with CORDIS ANIMA networks. Wave Digital Filters are lumped models which are based on a scattering theoretic formulation which simplifies interfacing to Digital Waveguide models in contrast with the CORDIS ANIMA models.

This research investigates the similarities of those formalisms, as well as focuses on the advantages of each modeling technique and proposes a real time computable interface between them. Moreover it results as well in a common convenient structural representation of their computational algorithms using signal processing block diagrams. These hybrid models were designed directly by their block diagrams, simulated and run in differ time using the Simulink software package of the matlab technical computing language.