MUSIC AI  vs.  ALGORITHMIC MUSIC

First piece composed by computer
Rule-based, uses traditional harmonic rules

VS.

Iannis Xenakis, *ST/10* (1956-1962)
Robert Rowe, *Cypher* (1992)
Interactive; “listens” to performer and answers with similar music

data-driven; composes whole musical works in the style of a composer
STYLE REPLICATION:
Recreating aspects of a composer’s music

Musical aspects: melody, harmony, form, texture, counterpoint ...

“Extramusical” aspects: mood, expression ...
Francois Pachet, *Continuator, VirtualBand*
Interactive, Markov-chain-based style replication (jazz)

http://www.youtube.com/watch?v=4q8t6NrWojw&list=TLtMf3jrRmQ0-vE4A_3Xm_rqhL49nuNDUc
COMMON TOOLS:

Max/MSP
Visual programming language for music and multimedia
http://cycling74.com/

PureData
Free open-source distribution of Max/MSP
http://puredata.info/

SuperCollider
Real time audio synthesis programming language
http://www.audiosynth.com/

ChucK
programming language for real-time sound synthesis and music creation.
http://chuck.cs.princeton.edu/

JMSL (Java Music Specification Language)
http://www.algomusic.com/jmsl/
Limitations of Markov chains:

Difficult to control

Good for streams of notes, but mangle larger “chunks” like melodies
MEZZO – real-time, procedural, adaptive soundtrack composer

Inputs:  
(compile time)
Harmonic progressions
Melodies to be associated with characters and important game objects (“Leitmotivs”)

(run time)
Narrative and expressive states to be evoked musically.

Outputs:  
New harmonic progressions in the style of those input
Harmonizes melodies over the new progressions.
Creates musical phrases using these melodies and harmonies to express different narrative states.
 Reactive: a sound or music fragment occurs when player does one thing. 
Short, isolated sounds that can occur anytime.

Adaptive: music expresses the current general state of the game. 
Longer sections of music that change more slowly, 
are related to each other
At different states of the game, the program maps these leitmotivs to appropriate values of certain musical features, in order to express the game state or action and the characters' states.
LEITMOTIV TYPES: protagonist, antagonist

CHARACTER STATES: normative or non-normative
PROTAGONIST LEITMOTIV / NORMATIVE MAPPING
player triumphing

PROTAGONIST LEITMOTIV / NON-NORMATIVE MAPPING
player struggling or failing

ANTAGONIST LEITMOTIV / NORMATIVE MAPPING
enemy triumphing

ANTAGONIST LEITMOTIV / NON-NORMATIVE MAPPING
enemy encountered

norm
(low harmonic tension, medium energy, high regularity of repetition)

non-norm
(high harmonic tension, very low or very high energy, low regularity of repetition)
PROPP: Story functions
(Morphology of the Folktale)

α – Initial situation (introduction of protagonist; peace, prosperity)
β – Protagonist departs from peaceful context
γ – Antagonist is encountered
δ – Antagonist deceives/harms protagonist
ε – Protagonist seeks to regain health/prosperity by fulfilling a task
ζ – Protagonist succeeds
η – Antagonist is punished

POSSIBLE STORY SEQUENCE:  αβγδεεζη
MEZZO demo video:

http://www.youtube.com/watch?v=r13M7OG8ANA
Some good reference books:


My dissertation is available here on my website along with links to other papers:

http://www.danielbrownmusic.com/cv.html