Cubist Characters for Virtual Worlds

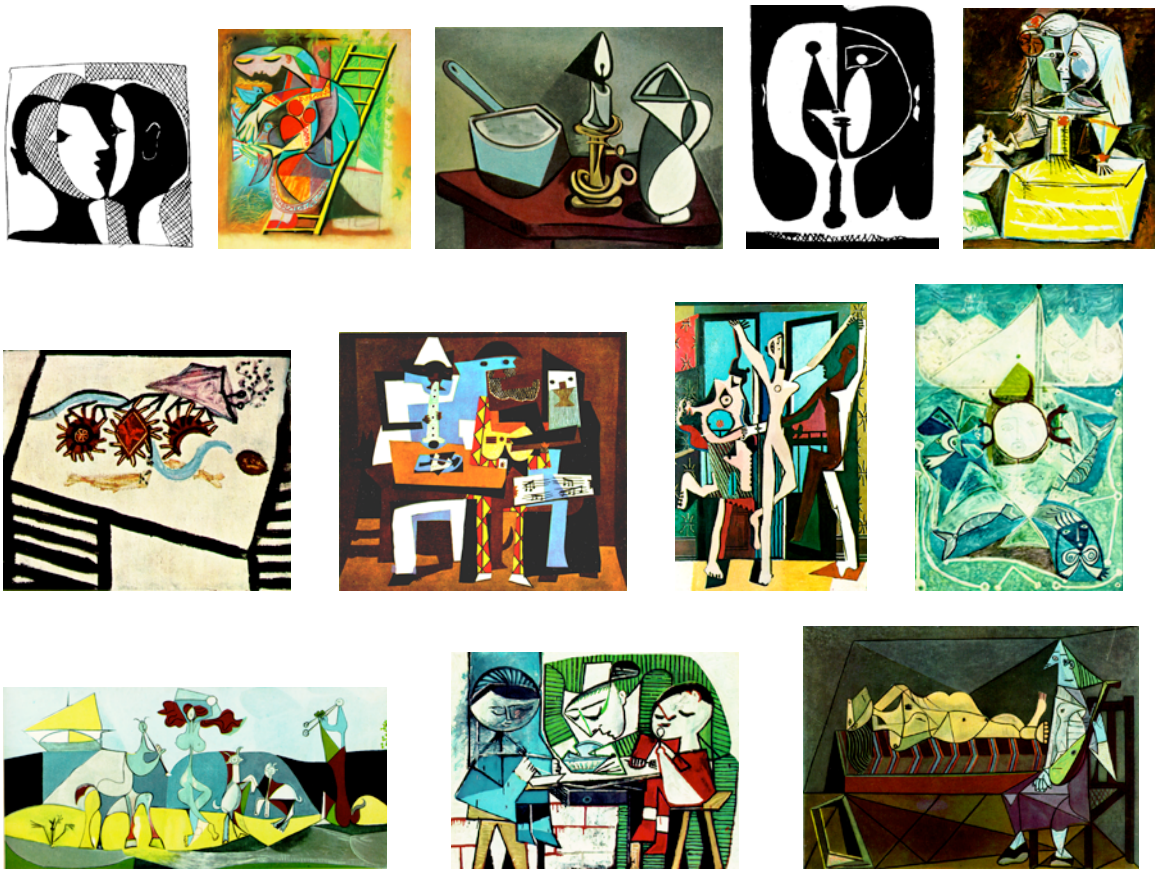
Carol Strohecker

Originally appeared as Note 98-03, Mitsubishi Electric Research Laboratories, revised from Note 96-16

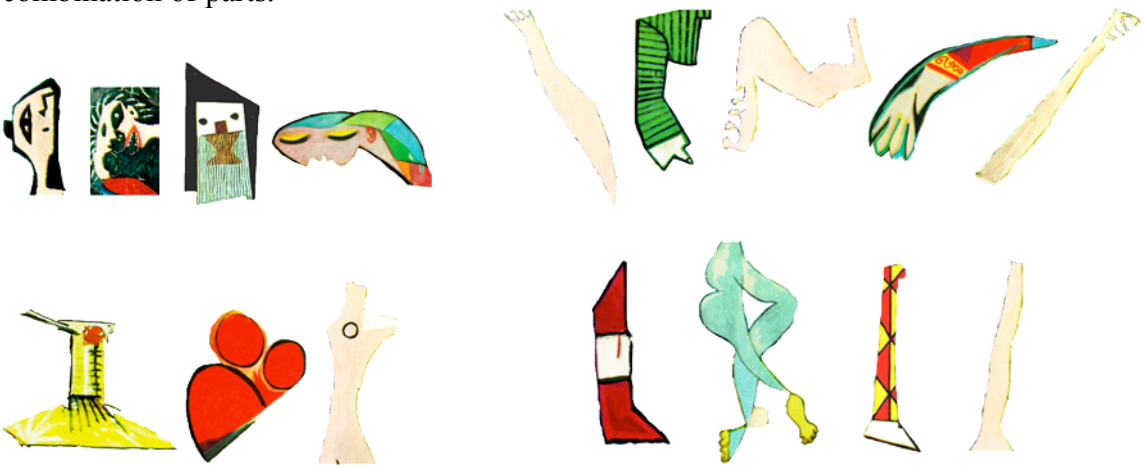
Abstract

Image segments from Picasso paintings are the elements of a software "construction kit." Users assemble the parts into human-like figures that may become characters for a virtual world. Each body part has attributes that govern its behavior in the world. These attributes include springiness, margins of proximity to other parts, and degrees of affinity for other parts. When the parts are composited into the form of a character, it displays an overall behavior that emerges from its particular combination of parts. Among the emergent characteristics are style of movement and apparent ways of relating to other characters. Users may control additional aspects of the characters' locomotion within a virtual world.

Figures from Picasso paintings[1] are interpreted as human-like forms. As they move within a virtual world, the figures tend to maintain the cubist style of simultaneous dissociation and connection.



The figures are composited from various parts. Each body part has a few specific properties that govern its behavior in the world. When the body parts are assembled into the form of a character, it displays an overall behavior that emerges from its particular combination of parts.



[1] N.B.: Image reproduction rights arranged with Artists Rights Society.

Visitors to the virtual world control the characters' locomotion. A device like a joystick governs direction of smooth movement, and a button causes an occasional leap.

Thus directed, the composite beings clotter along, their cubist parts rattling, shifting, and rearranging with movements that are sometimes ambulatory, sometimes acrobatic. The movements are not a function of real-world physics, but stem from a robust and internally coherent "wacky physics."

This physics consists of two levels of behaviors. Body parts are associated with degrees of springiness, speed, and margins within which other parts "connect" (the parts may or may not actually touch).

Parts also have specified degrees of affinity for other parts. Such affinities affect a character's behavior when it encounters another character. For example, face A may lean toward face B but avoid face C.

Thus characters show different "faces," different aspects of their fragmented bodies, to various other characters. When two characters meet, they reorient so that the matched aspects "face" each other.

Such orientations happen quickly for characters who already "know" one another. For strangers, there is a period of standing before each other, rearranging and reorienting, until two faces settle into proximal relationship. Maybe other things are happening while this get-acquainted dance is going on: conversation, musical exchange, or the like. Eventually, underlying programs about character histories and attributes may help to decide which faces recognize one another.

Making and naming one's own characters, and controlling their locomotion, could become modes of interaction within a virtual environment. Observing the characters' responses to one another may support users' development of intuitions about emergent effects of dynamic systems.