The Emergent Improvisation Project

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The Emergent Improvisation Project is a research project into the nature of improvisation in dance and music. In this context improvisation is understood to mean the spontaneous creation of integrated sound and movement by performers who are adapting to internal and external stimuli, impulses and interactions. Ordinarily, we think of order and form as externally imposed, composed or directed. In this case, however, new kinds of order emerge, not because they are preconceived or designed, but because they are the products of dynamic, self-organizing systems operating in open-ended environments.

This phenomenon – the creation of order from a rich array of self-organizing interactions – is found not only in dance and music, but also, as it turns out, in a wide variety of natural settings when a range of initial conditions gives rise to collective behavior that is both different from and more than the sum of its parts. Like certain art forms, evolution, for example, is decidedly improvisational and emergent, as is the brain function that lies at the heart of what it is to be human.

Emergent forms appear in complex, interconnected systems, where there is enough order and interaction to create recognizable pattern but where the form is open-ended enough to continuously bring in new differentiations and integrations that influence and modify the form. It is by way of these interactions that particular pathways for the development of new material are selected.

In linking the creative work of art-making to the emergent processes evident in nature, there is basis for a rich and textured inquiry into how systems come together, transform and reassemble to create powerful instruments of communication, meaning and exchange. This project explores the ways in which natural processes underlie artistic expression along with the possibility that art can help illuminate natural processes.

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Definitions

improvisation: any process that thrives on and is contingent upon the following:
-open-endedness (not closed system)
-constantly seeking out, utilizing, and being affected by change
-display of a high degree of adaptability
-awareness of information of the present moment
-subject to the interplay of internal/external multi-awareness and intentionality
-emphasis upon the interchange of integration and differentiation that forms coherence and the emergence of information (the difference that makes a difference---Shannon)

self-organization: a state in which various elements of a system begin to change the composition of the entire system through their own dynamic, intricate, interdependent, and multiple interactions. Primary properties of self-organization include:
-no external designer or force
-no central control
-entropy dissipation and nonlinearity (the system moves away from equilibrium)
-attractors, as well as the systems own structure constrain the system
-local interactions preclude and determine global behavior (swarming)
-noise, fluctuation, and messy webs of information can be a source of order
-thermodynamically open, but functionally closed
-steady state rather than equilibrium
-adaptation to environment through the selection of stability, efficiency, and reproductive fitness
-lives on the edge of chaos (the moment of criticality), where there is a constant interplay of variability and stability (Edelman and consciousness theories)
-presence of topology or global relationship that denotes ensemble characteristics (see topology definiton)

emergence: a phenomenon of self-organized criticality, whereby a new system surfaces with a newly intact system of organization (created through interactions between whole of the parts and parts of the whole). Emergence cannot be predicted using existing principles of explanation (weak forms), nor can be explained by developing a whole new framework or theory (strong forms); instead, there are mutual causal explanations and constraints between phenomena and new (epi) phenomena. (Emergence occurs as a special case of topological transformation of topologies into the moment of complexity---Deacon)
Three types of emergence:
supervenience (atemporal/synchronic): no time dimension; only large aggregates have qualities. One molecule of water does not have wetness;

liquid qualities of water thus supervene on properties of individual molecules. The number of molecules and their particular energy state give rise to ice, water or steam.

self-organization (diachronic): has time dimension; configurations of individual components/interactions in a system exert an organizing effect on the entire ensemble; occurs in systems open to matter/energy flow (change) that keep it away from equilibrium (the state of no change).

evolution (diachronic): the sociology of a system (over time); self-organizing systems that can select and store particular information for system stability and survival and develop accordingly; the process underlying the emergence and survival of living things (--Edelman)

landscape: a setting or terrain which contains a particular environment or field, in which the components of a system interact.

field: a particular understanding and temporal development of energy, information, or emotional resonance/tone , which has the ability to unfold and emerge through open-ended interaction of components present in the environment.

the environment: the surroundings and atmosphere of a organism, system or structure which contribute to and affect its development and energetic milieu.

constraints: frames in a system that allow for self-organization/arising structures to become visible/understood.

boundaries: the borders or margins, usually in physical space, which reign in the activity of a structure or system.

self-organized criticality: a state in which complex behavior in nature reflects the tendency of large systems with many interacting, interdependent components to evolve into a poised, delicate state, without the direction or design of a central, overriding, or outside agent. This moment of criticality resides in a narrow region between order and chaos, where conditions are in a prime state for change, adaptability or evolution of some kind. Self-organized criticality evolves away from any equilibrium or balanced condition, where the most minor of disturbances may lead to events of all sizes. Many of these changes take place through catastrophic events rather than by following a smooth gradual path (although possible), whereby the system is highly sensitive to initial conditions of change. Self-organized criticality is established solely because of the dynamical interactions among individual elements of the system (Per Bak)

edges: the limits and extremes (spatially, energetically, thematically, or otherwise) which constrain a particular system.

scale: the lens through which one views a systems range of possibility, the

distance between extremes, and its scope of activity.

memory (work on this): term used for a variety of systems in the brain with different characteristics. In all cases, however, it implies the ability to reinvoke or repeat a specific mental image or a physical act. It is a system property that depends on changes in synaptic strengths (based on value systems). (--Edelman)

remembered present (work on this): a phrase used to describe the temporal aspect of the scene constructed in primary consciousness, suggesting the role of memory processes in that construction. (Close to the specious present quoted by William James in The Principles of Psychology, which designates the present that we are aware of experiencing.) (--Edelman)

degeneracy: the ability of different structures to carry out the same function or yield the same output. (--Edelman)

reentry: the dynamic ongoing process of recursive signaling across massively parallel reciprocal fibers connecting maps. This process results in binding and is the basis for the emergence of consciousness through the workings of the dynamic core. Reentry allows coherent and synchronous events to emerge in the brain; that is, it is the basis for spatiotemporal correlation, which in the absence of logic (such as governs a computer), the brain must correlate time, space, and sequence. Reentry is unlike feedback, which always operates from an output to an earlier stage, often applied indiscriminately and vaguely to any correction of input by a reverse signal. Reentry, on the other hand, may occur between stages operating in parallel at the same or different levels of a system. (--Edelman)

umvelt: the effective environment of an organism (for survival); the organism is not aware of all components of this environment. An umvelt is the reflection of the embodiment/embeddedness of the mind of the organism.

selection(ism) (work on this): the notion that biological systems operate by selection from populations of variants under a variety of constraints. The opposite is instructionism. (--Edelman)

value, value systems: the constraining elements in a selectional system consisting in the brain of diffuse ascending systems. In humans, value is modifiable under some constraints. Value systems arise out of global mapping, histories, and various memory processes. Global mapping is a term referring to the smallest structures in the brain capable of perceptual categorization. It reflects the activity of multiple reentrant maps, motor and sensory, linked to nonreentrant structures and finally to muscles and sensory receptors capable, through movement, of sampling a world of stimuli. Perceptual categorization is the process by which the brain carves the world up to yield adaptive categories and is the most fundamental of early cognitive functions. (--Edelman)

dynamic core: a specific cluster of components that constitute a unified

process (integration) of high complexity (differentiation) that emphasizes constantly changing and strongly interactive activity patterns among the group. The dynamic core has the ability to change in composition or shift over time (through self-organizational means). In dance improvisation, the dynamic core could shift from the main event to a chorus or background element. Dynamic core is a term used in the extended TNGS (Theory of Neuronal Group Selection) to refer to a system of interactions, figured mainly in the thalamocortical system, which behaves as a functional cluster. The core sends signals mainly to itself, and its reentrant interactions are assumed to give rise to conscious states. (--Edelman)

functional cluster: a property of integration that eventually results in the unification and self-organization of components. In dance improvisation, a functional cluster could represent the compositional focal point or hot spot of activity or attention. In complexity theory, it is a system or part of a system that interacts mainly with itself. (--Edelman)

attractors: a property of self-organizing systems, in which a region of phase space allows a dynamical system to settle down, yet maintain active residence; ranges of behavior/parameters of energy fields (not exact points). Types of attractors (work on these):
point attractor: momentum eventually comes to a rest point (fixed state); pendulum swings; heat creates friction; stops the swing; watch tickingpath is always consistent.

periodic attractor: pendulum overcomes friction (limit cycle attractor), but weight keeps it along the same path with differentiality in how it gets there; ellipsis

chaotic/strange attractor: Lorenzs butterfly effect; extreme sensitivity to initial conditions; weatherlarge # of components (hurricane formations); the chaos still organizes into a frame of phase space (water-ice-gas)

phase transition: a change in the recognition of an attractors phase space; describes the particular activity parameters of the system.

attention: the ability to consciously select certain features from the vast array of sensory signals presented in the brain. Similar to discrimination, which denotes the capacity of conscious systems to categorize, distinguish, or differentiate among a multitude of signals or patterns in terms of integrated scenes and qualia. (--Edelman)

focus/focal attention: an attentional state directed toward a single object, thought, or experience. (--Edelman)

topology: the spatial-temporal relationships among component elements and their interactions with intrinsic causal consequences. It is not a single relationship, but a space of relationships, or rather the space of spaces of relationships. Through the specific topology of a system is the emergence of

temporal direction, whereby the descriptive features of a physical system compose a global or ensemble relationship that makes a difference through amplification processes, specifically pattern formation. Deacon
In dance improvisation, a topology represents a particular overview or understanding of all awareness sources for a specific piece: the activity of executing and creating all practices of embodiment/solo composition, emergent forms, and compositional structures that offer a dance its own blueprint of development or lifespan. (work on metatopologythe piece itself is larger that the parts; what the piece calls for, inherent information to be realized...)

forms: the specific (self)organization of material/information that emerges into coherence or a shared understanding among elements of a system.

patterns: a configuration of information or interaction in a system that has an understood sequence, design, arrangement or relationship.

composition: in improvisation, the temporal unfolding of the particular lifespan of an emergent form.

structure: in improvisation, a particular set of instructions and constraints that organize the possibilities within an emergent composition.

stillness: in improvisation, an active presence in an environment without movement or sound, with acute self and group awareness of its occurrence.

meaning (work on this): in neurobiology, the realization of a value systems bias or of a goal. In language, the denotation and connotation of a word-its semantics. (--Edelman). In improvisation, the significance, resonance, or implications of a systems information.

fluid systems (based on the work of Bonnie Bainbridge Cohen and Body-Mind Centering): textural shifts in an individuals movement vocabulary originating from the distinctive properties of various fluids in the body; (immersion/ embodiment of the mind into each system; how the insides become the outsides):
-Synovial: joints (ragdoll), buoyant
-Lymph: attack, very specific focus (archery), exact, articulated down to precise detail
-Arterial: energy/focus pumping outward, aerobic, constant, expanding high energy
-Venal: energy/focus pumping inward, swing/curves/rebound, returning into the self, more internalized, softer focus, breath
-Interstitial: fascia/connective tissue, gluey, sticky, like taffy, constant, sustained, (slow or fast), gaze equally internal/external
-Cerebrospinal: fluid running up and down the spine; length of the spine, centering quality, martial arts feel, facing, directions, and movement from and around center, very grounded
-Cellular: lubrication of the cells to create homeostasis; extremely internal, a

quiet place addressed with stillness, approaching stillness/silence, movement/ sound occurs within and around stillness/silence; why do you decide to make a move/sound

energy levels (based on LeCoq Theatre techniques): energy shifts/levels of intensity in an individuals movement vocabulary:
-barely alive
-casual, relaxed, neutral
-alert, attentive
-intense, passionate
-ecstatic, extremes

body scan: a practice of personal awareness/embodiment of ones body alignment, mechanics, energetic potential/neutrality, and/or response to stimuli.

physical language or movement vocabulary: a personal process of exploring movement as a way of building a kinetic philosophy, technical base, and a repertoire of shared information within an ensemble. This language/vocabulary is grounded in the history of ones own embodiment. It is an open-ended process of discovery in which one chooses fundamentals of movement that are unique to the individual and is accessed through the principles of emergence, selection, histories, constraints, value systems, and topologies.

ensemble: the components of a system and their subsequent interactions. In improvisation, the group of individuals who explore various ideas, structures, or systems, and of whom share a working connection or collective understanding through their interactions. (similar to swarm intelligence??)

swarm intelligence: a natural and biological phenomenon that evokes distributed group intelligence and understanding. This group leadership is determined by:
-emergent control, through which occurs a temporal element to its activation
-external stimulus, more than genetics
-an order that is lead by example and mutual decisions
-scalability (the range between opposing extreme conditions, i.e. orderchaos)
-fault tolerance (perturbations)
-speed
-modularity
-autonomy
-parallelism
-adaptation
Swarm intelligence is a complex system that is affected by the following properties in its components:
-critical size
-self-organization
-directional patterns
-cluster patterns
-attractors

-rhythm
-speed
-spatial location/relationships/interactions
-collective swarming shape

main event / chorus: in improvisation, a particular structure which sets up an open-ended dynamic between a focal point or hot spot and the supporting system, frame, or background element.

development: the process of growth, maturation, progress, and/or change that occurs in an organism, system, or structure.

performance: in improvisation, the presentation of particular and coherent structures, ideas, or systems, with or without an audience present.

embodiment: the view that the mind, brain, body, and environment all interact to yield behavior. Used in some sense to contradict the idea of a disembodied mind or dualistic consciousness. (--Edelman)
In dance improvisation, embodiment is a practice and foundation that lies solely in accessing ones own body information as a unique, dynamic, and open-ended source for the development of personal kinesthesia and/or the selection of personal movement vocabulary (rather than using or relying exclusively on exterior sources of movement instruction based on image and/or outside perception). Its basis lies in corporeal consciousness (--Sheet-Johnstone), which is the recognition and understanding of that which one is through movement, and is accessed through a variety of means: breath, body scanning, attention, sensory/proprioceptive awareness, mapping, and value systems.

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