Conversation Theory

Introduction and Applications in the Arts

presented by
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Overview of Presentation

Gordon Pask

Conversation Theory Overview

Contemporary art projects based on CT

etc...

Gordon Pask

British Cyberneticist

MA in Natural Sciences from Cambridge, 1952

PhD in Psychology from University of London, 1964

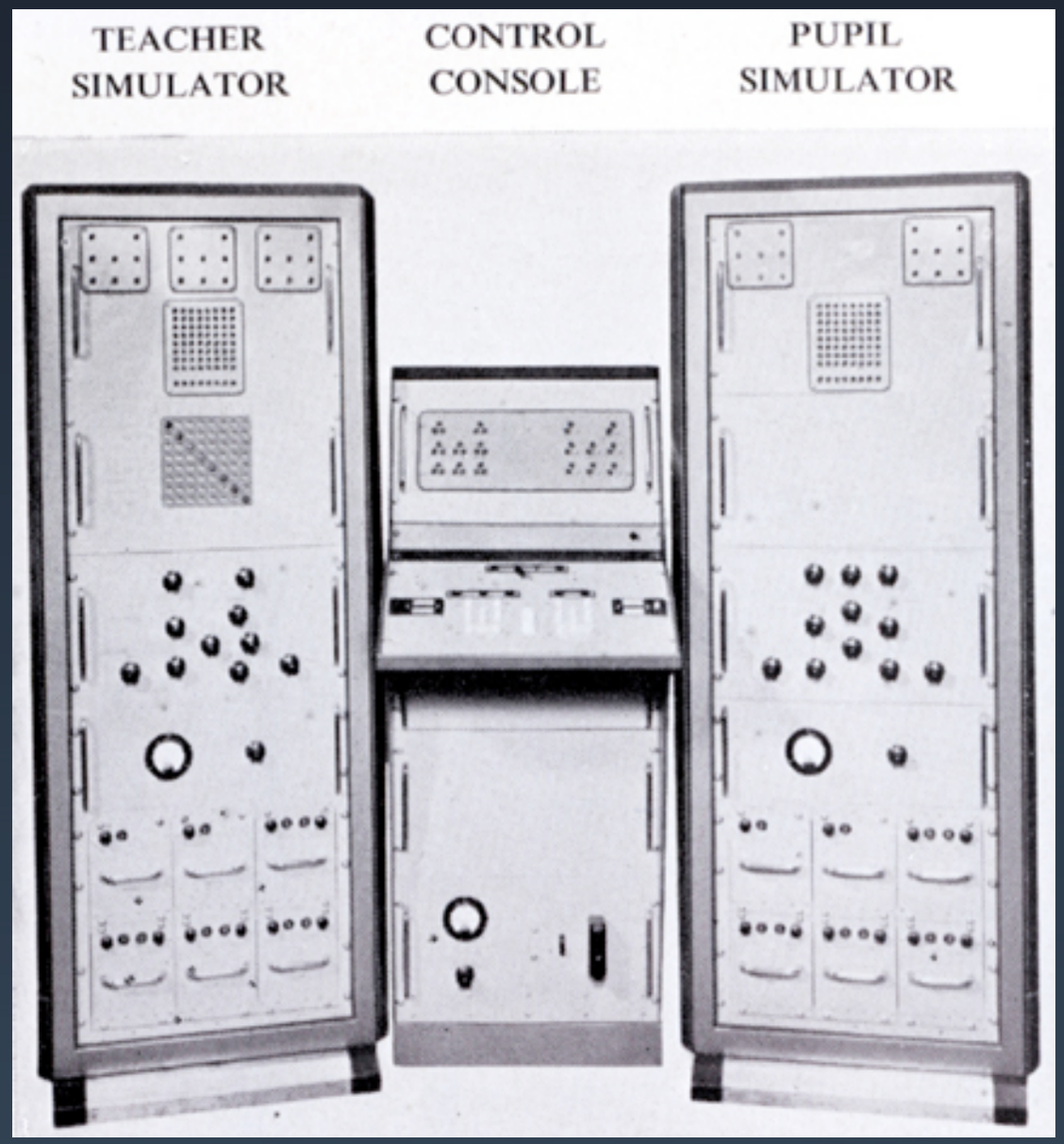
Created machines/systems that helped him develop models of agreement - which led to CT

Concerned with how knowledge was generated, how people learned

Background in theatre, playwriting

Gordon Pask

An early machine by Pask was Eucrates (c. 1956), an embodiment of a conversation between machines, where one machine literally "teaches" the other.



Source: http://www.cyberneticians.com/slideshow/eucrates.html

Gordon Pask

Moving from machine-to-machine learning in Eucrates,the THOUGHTSTICKER environment (c. 1976) used a knowledge structure (left) to mediate a conversation with a student.

As a result of the student's interactions, new perspectives in the knowledge were displayed on dynamic graphics tubes (right). The system uses "agreement" as the primary measure of success for the student.

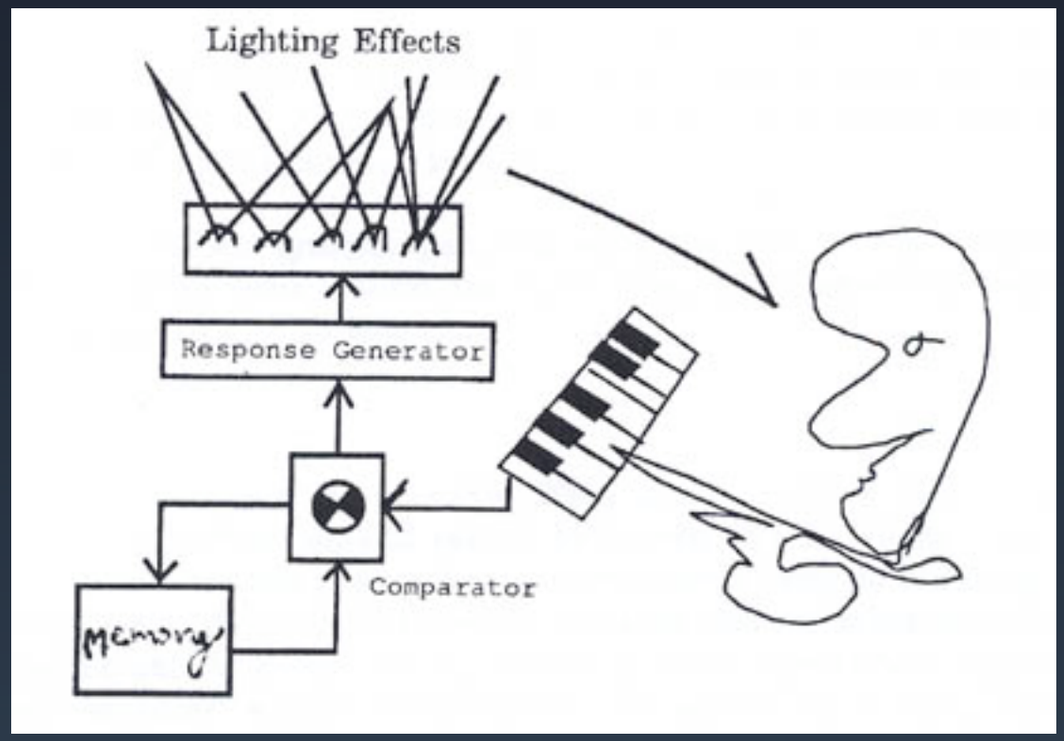
Source: http://www.cybernetics.com/slideshow/thstr-machine.html

- software embodiment of "entailment meshes"
- proof of concept of CT

Gordon Pask

In a relationship with a cybernetic machine called Musicolour (c. 1956 by Pask), the musician (right) plays a keyboard, whose music is fed into a comparator that contrasts it to a goal-state and a history ("memory").

The Response Generator controls a bank of lights that are viewed by the musician, closing the loop.



Source: http://www.pangaro.com/ASC2002/musicolour.html

Gordon Pask

The Colloquy of Mobiles

An reactive system composed of 5 rotating mobiles that communicated with each other via light and sound. The goal of communication was to achieve a level of "satisfaction" between the "male" and "female" mobiles. People at the exhibition could take part in the conversation between the machines by using flashlights and mirrors to influence the mobiles' learning process.

Gordon Pask, «The Colloquy of Mobiles», 1968
Installation view, ICA London 1968,
«Cybernetic Serendipity»

Gordon Pask

The Colloquy of Mobiles

Video from <Cybernetic Serendipity> exhibition at ICA, London, 1968.

Source: http://www.cyberneticians.com/video/Colloquy-mastershot.mov

Gordon Pask

The Colloquy of Mobiles

Diagram

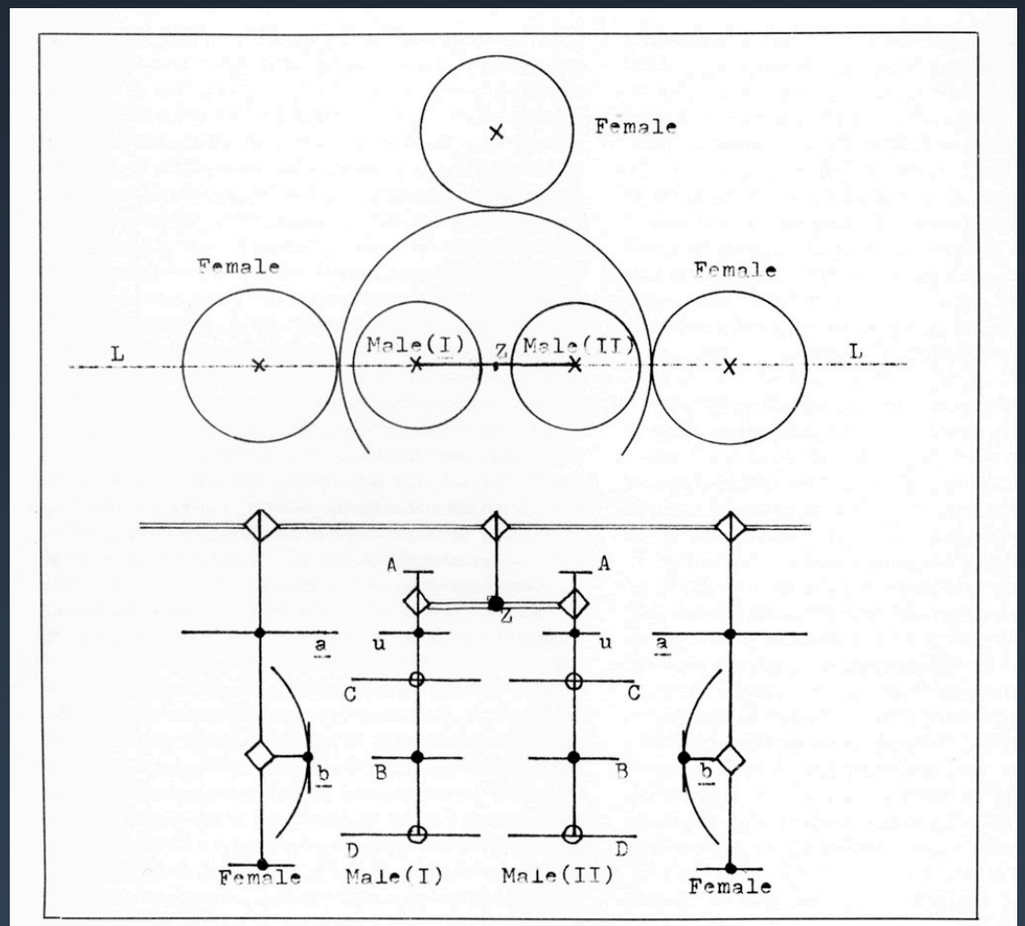


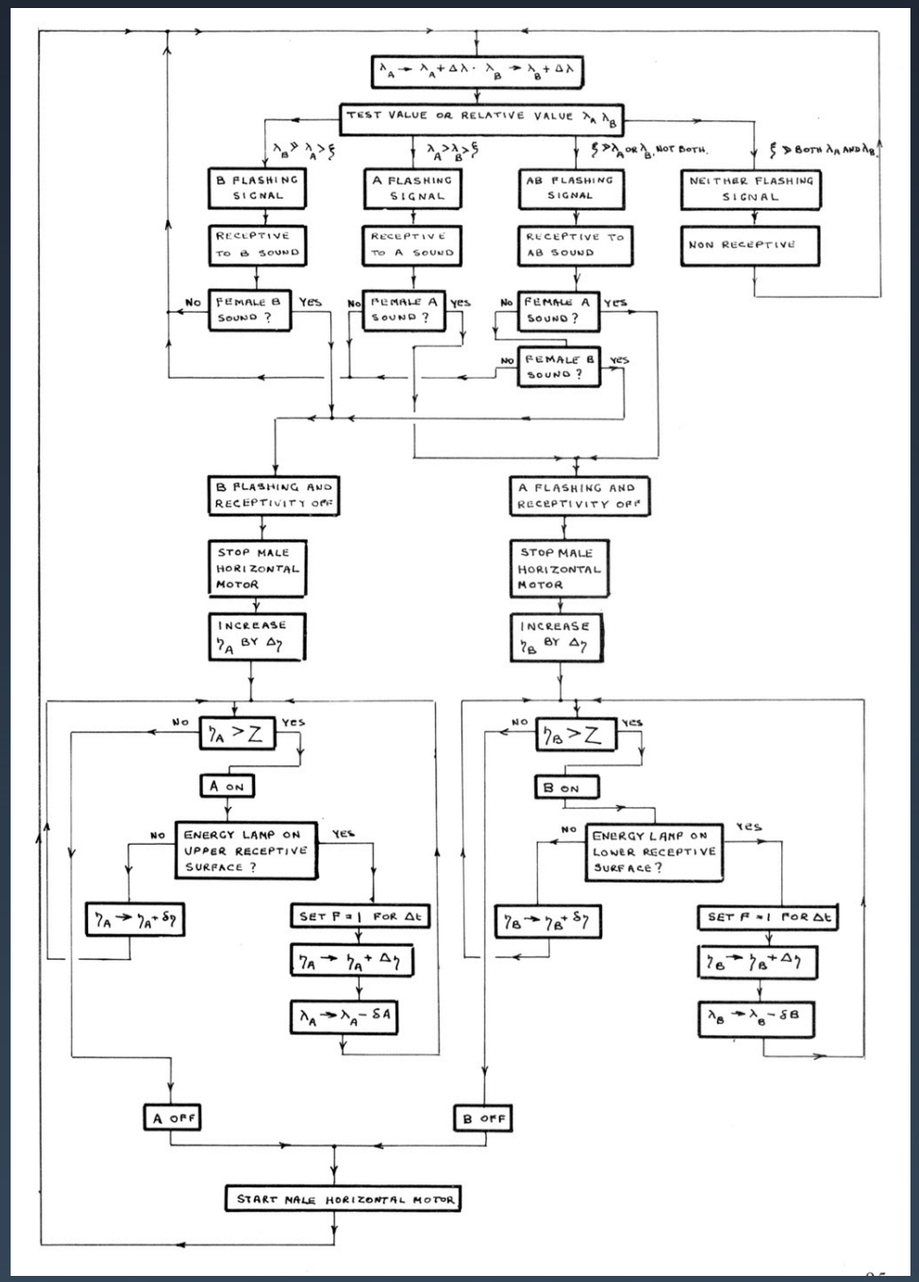
Fig. 34 A rough sketch of powered mobiles.
a Horizontal plan
b Vertical section taken through line *L* in horizontal plan.
A = drive state display for male
B = main body of male, bearing 'energetic' light projectors *O* and *P*
C = upper 'energetic' receptors
D = lower 'energetic' receptors
U = non-'energetic', intermittent signal lamp
a = female receptor for intermittent positional signal
b = vertically movable reflector of female
Z = bar linkage bearing male I and male II

= Drive motor
= Free coupling
= Fixed coupling
= Bar linkage

Gordon Pask

The Colloquy of Mobiles

Flowchart



- Introduction
- Eucrates
- THOUGHTSTICKER
- Musicolour
- The Colloquy of Mobiles

Conversation Theory

CT is a cybernetic framework that offers a scientific theory that attempts to describe how interaction between two or more systems (be they human/machine, human/human or machine/machine) leads to the construction of knowledge.

Pask's main premise is that reliable knowledge exists, is produced, and evolves in action-grounded conversations. Knowledge as an object distinct from learner-teachers does not exist. (Boyd, 2004)

Conversation Theory

Explains the emergence of knowledge through recursive interactions (called conversations)

Supported by modeling facilities and communication interfaces.

Differences among participants over a given concept are progressively reduced (correct each other's misconceptions) until an agreement is reached.

"applied epistemology" (Boyd, 2004).

The resultant interactions may then be stored as "entailment structures" or an "entailment mesh", an organized publicly available collection of the resultant knowledge.

Conversation Theory

Formalized brainstorming

"Bootstrapping" of knowledge representation

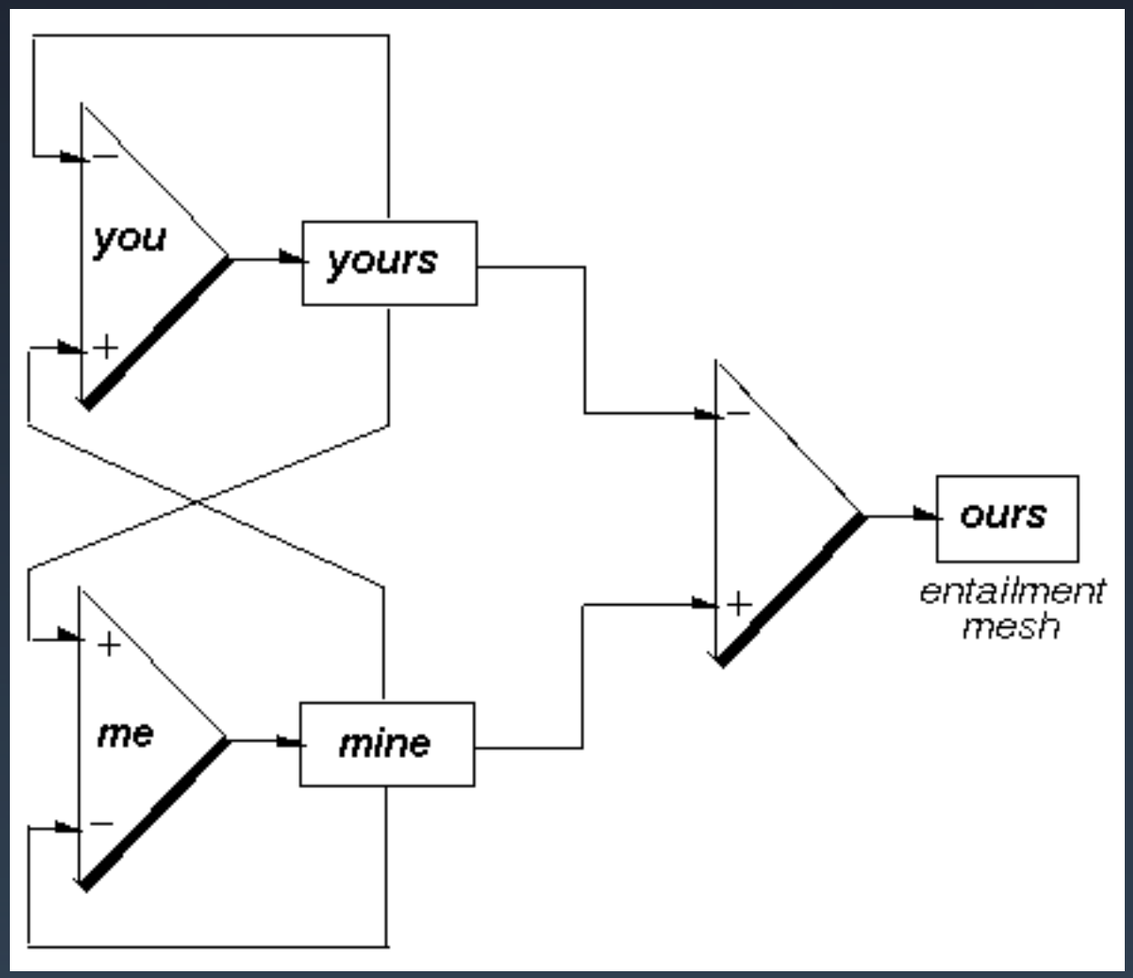
Second-order cybernetics

Constructivist

Proponents argue it offers a more flexible approach than traditional AI knowledge representation systems

Richer model of interaction

Conversation Theory



Martin Ryder
USENET: a constructivist learning environment
http://carbon.cudenver.edu/~mryder/aect_95.html

Conversation Theory

Conversations are mechanisms through which meanings within a particular domain are agreed upon.

A "strict CT conversation" is constrained so that all topics belong to a fixed, agreed upon domain, called the conversational domain. These domains are organized of the following components:

Conversation Theory

Topics - the focus of a particular conversation. A set of relations which when brought together, solve a particular problem (Boyd, 2004).

A family of "entailment structures" - like maps of topic names, showing connections/relations between topics.

Sets of "task structures" - for building models or performing other activities which can produce the prescribed topic relations (Hayut-Man, 1995). All the ways a topic relation can be explained.

Actual concrete media ("modeling facilities") in which task activities can be enacted or executed as models (Hayut-Man, 1995).

Concepts - procedures for bringing about relations. Not a set of things (Pask, 1975).

Conversation Theory

An entailment in CT is defined as any legal derivation of one topic relation from another (i.e. - how something may be learned).

X entails Y if X is legally derivable (at least in part) from Y.

Chains, meshes, structures

Conversation Theory

Entailment mesh
Computer-manipulable public descriptions of what may be learned/known of a domain (Boyd, 2004).

Show all the main topics and their various relationships.

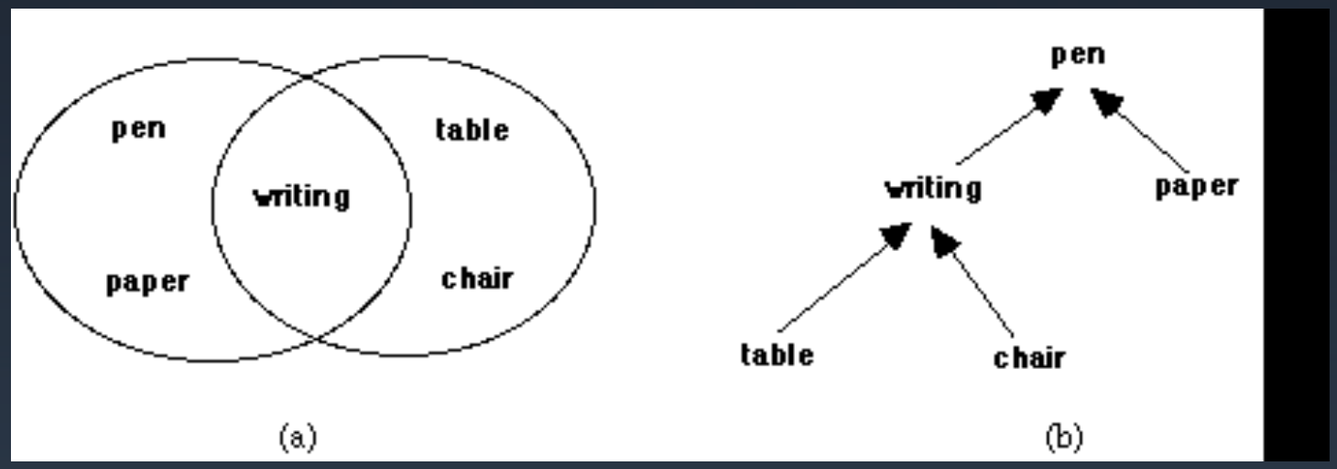
Often described as the "residue" of a conversation

Entailment structure
The "final product" with which one interacts.

A "pruned" entailment mesh (e.g. - removal of redundancies).

Enhanced form of "mind map" or "concept map"

Conversation Theory

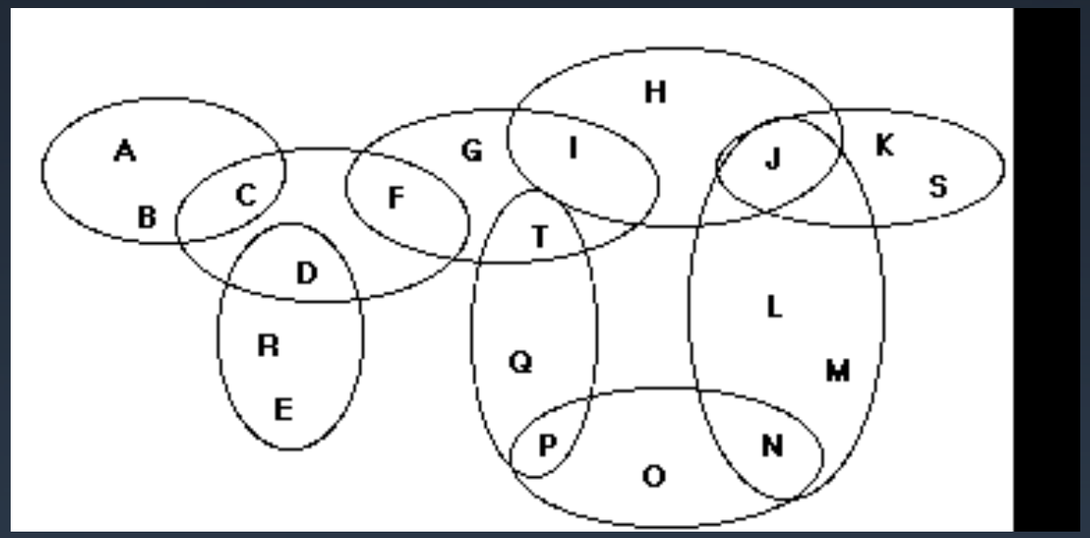


(a) a simple entailment mesh consisting of two coherences overlapping on the topic writing

(b) a prune unfolding of the same mesh from the point of view of the topic pen.

(Heylighen, 1997)

Conversation Theory



A more complex entailment mesh

(Heylighen, 1997)

Art Projects

C5

Usman Haque

Art Projects

Radio Controlled Surveillance Probes (RCSP)

Each probe is identical and equipped with real-time audio/video camera for transmission perspective information

on-board microprocessor and digital compass encode exact positioning of each RCSP.

Data is organized into knowledge representations

C5, Radio Controlled Surveillance Probes. Source: http://www.c5corp.com/venues/siggraph98/docday2.shtml

Art Projects

Four Research Strategies:

Complexity

Autopoises

Ubiquity

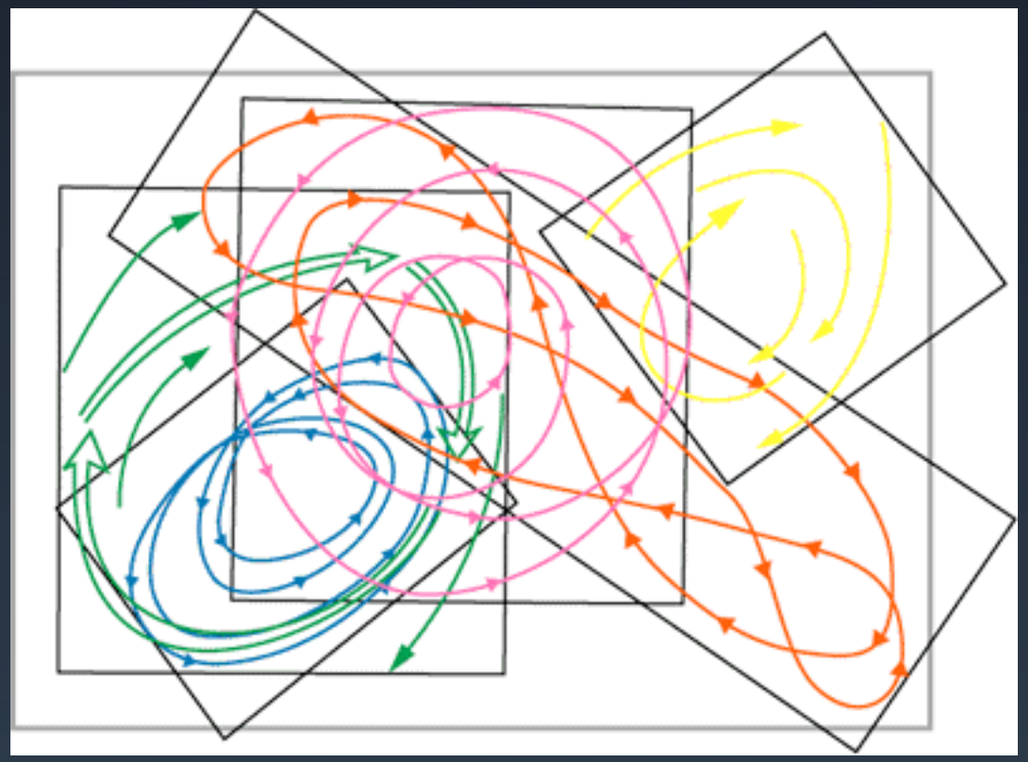
Adaptive Learning

C5, Radio Controlled Surveillance Probes. Source: http://www.c5corp.com/venues/siggraph98/docday2.shtml

Art Projects

Complexity

Right: RCSP Phase State
Entailment Mesh Equilibrium

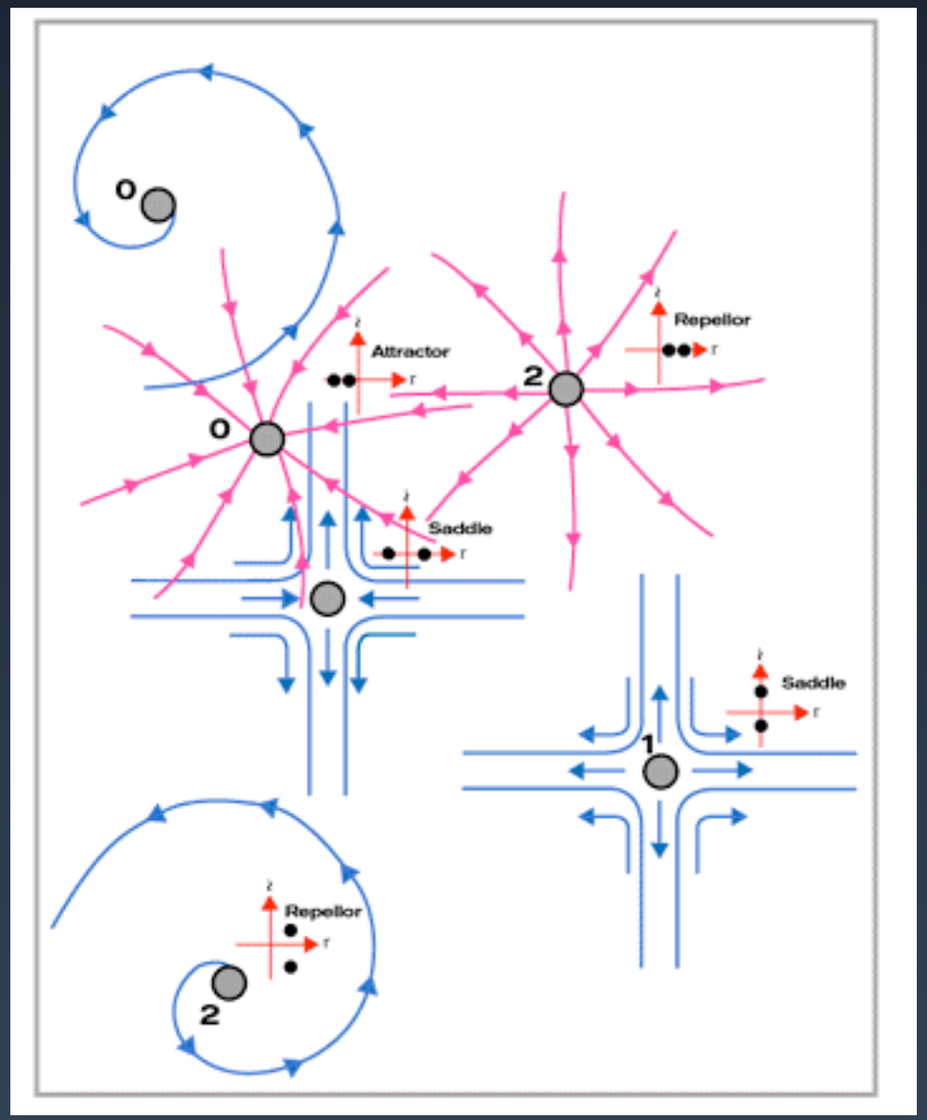


Source: http://www.c5corp.com/projects/rcsp/complexity.shtml

Art Projects

Complexity

Left: Adaptive Interaction/ Reaction
Based on attractor/repeller state assignments

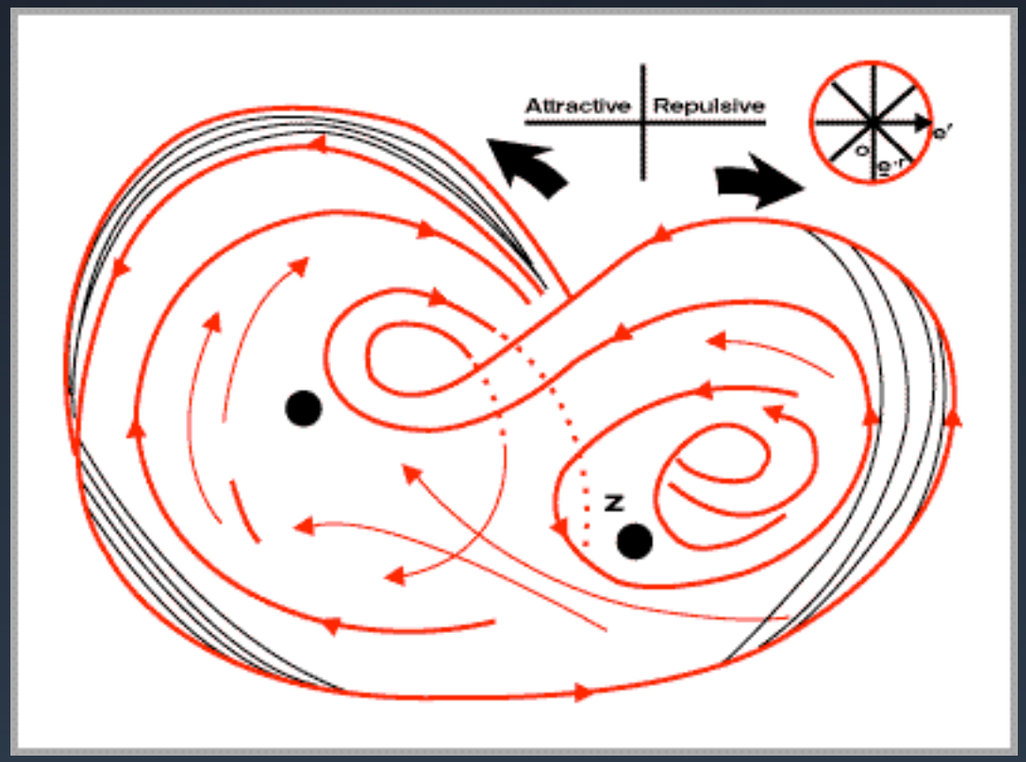


Source: http://www.c5corp.com/projects/rcsp/complexity.shtml

Art Projects

Complexity

Left: Non-predictive Equilibrium



Source: http://www.c5corp.com/projects/rcsp/complexity.shtml

- Overview
- C5
- Usman Haque

Art Projects

Entailment Mesh

Mediated social network/ brainstorming application

Conversational brainstorming via distributed wireless devices

Source: http://www.c5corp.com/research/entailmentmesh.shtml

Art Projects

Paskian Environments

Aims to reconsider Pask's relevance to the construction of "interactive environments"

Exploring interaction and conversation in built spaces

References

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