

# COLLECTIVE DRAWING

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## ABSTRACT

This paper is referred to the experiences run at Iuav since 2004 in the framework of the EU-FSE founded Courses of Collaborative Composition. In these courses we built up some work/game thought as meaning of a distance collaborative game.

Rally around these games, we delivered specific knowledge and portions of technical knowledge referred to the issue of formal structure, shape grammar, and codify of “behaviours role” for a networked distance collaboration.

The subject of this didactic experience is the composition and of a collective figurative opera (an image) processed by the whole group of students.

The themes of the image have been different in each Course: a figurative opera, a facade of an urban street or a small square. The students shared a repertory of figures coming from the break down of paintings or pictures of palaces and used the repertory as a source in order to compose the final collective opera. On the other side we worked on the shape grammar roles, experimented tools and protocols of communication, analysed the best practice in this field and defined evaluation systems.

## Categories and Subject Descriptors

Methodology and Techniques - *Interaction techniques*

## General Terms

Design, Experimentation, Human Factors.

## Keywords

Collaborative drawing tools, shared drawing space

## 1. INTRODUCTION

In point of fact, a good technology supply is not correspondent to an equal in-depth way of representation, evaluation and correction in the framework of a collective design process and in particular of a figurative design process. Therefore, how can we structure a collaborative design work? And how the collaborative strategies influences the whole result?

The Course are started out from these questions.

The research hypothesis is that instruments “share oriented” are not enough to work in a efficient collaborative way and it is important to define elements, code, rules. In other word a language.

There are lots of support to the collaboration activity: informatics tools for communication and sharing, psychological instruments referred to the group theory.

These tools are still a kind of container and they are not influenced form the content or the subject to share. For instance, if we are going to share a figurative opera or a motorbike prototype or a literary composition, the collaborative tool an/or the communication support are still the same, they are not content-oriented.

It is easy to derive that the successful activity are the one that have an own inside structure; there are lots of differences between, for instance, write together and draw together: the first is based on a complex, accessible and stratified set of formal rules (syntax, semantic), the second have an ambiguous level of formalization, usually referred to the choose of tools, colours, dimension of the work surface.

## 2. THE START-UP

The scenario is that one or more group of artist decide to work together in order to realise a *collective opera*: it is an “opera” as far as it is a unique creation which put a specific goal in a concrete form (the image that we will namely *tabula* later on); *collective* as far as it is produced by more author and not by a single one.

The start up is to take some common decision about the general theme, the canvas size, other suggestion, lots of spread ideas. We suppose that the group will carry on a set of other decision, they will define the pattern of colours, they will discuss around a table, obviously a round table, and they will finally define a set of others details.

Soon or later someone will draw the first line on the canvas and someone else will wonder: which working order can we adopt? How can we subdivide the activity, the space, the resource? How can we go on in order to really share and ideas, suggestions and the generative process of the opera? How can we avoid to coexist against our will inside the same container?

We reach, in other word, the need of establish a set of rules in order to define the work of everyone, to be on the same wavelength as the group, and to make the differences (of culture, of competences, of creative capability, of technical skills) an advantage and not only an obstacle to solve from an organizational level.

The roles of the group can be, for instance, to share the big board into smallest rectangular plug and to assign to each participant a plug and some relational rules. Otherwise, the group can choose to promote a working plan based on a time schedule: each participant can draw on the whole canvas and on the work done by previous participants.

The whole rules of proximity, chromatic harmony, repetition and transformation of shape, let students to process the work through a “progressive harmonious adjustment”. The aim of the Course is understand and test the strategy of groups interactions, explore the benefits and the drawbacks of the communication and design tools.

### 3. CONNECTED KNOWLEDGE

In order to persecute the aim of the Course it is necessary to put together three type of collaborative oriented knowledge: image processing, on line sharing, shape grammar.

The first field of knowledge refers to practical knowledge necessary to participate to the work: process an image in order to separate figures from the background, insert figures in an on line shared hierarchical repertory, rebuild backgrounds, design new composition from the repertory.

The second field of knowledge gives information and behaviour models in order to use communication system for an on line interaction (forum, chat, revision system, annotation of draws, file sharing) and for define goals, describe and guide actions and composition, control the whole generative process of the common opera during its evolution. During the first day of the Course the of communication and sharing technique available on line are simulated in presence in order quickly reach the centre of the content.

The third field of knowledge is referred to shape grammar and is based on the idea that for an efficient composition it is important to make clear the object and the composition rules. This is one of the central theme of the Course and of our research in general: to define objects and rules, firstly means to share a common criteria to identify the object and that is the result of strategy closely connected to the theory of the shape grammar

The way in which figures can be elaborated, transformed, approached will be also influenced by the available tools, but we are going to take into account this condition later on. A point we pointed out during the Courses is to look for a transverse knowledge as regards the available systems: software is developing, command key get older but the transformations inside, even if their names changes, are always referred to the same mathematical knowledge.

### 4. BEST PRACTICE

In this paragraph we describe some reference experiences, specific field or cases where are used s-composition technique in order to reach specific goals and results.

The way in which an opera or an image is braked down for the composition is already part of the composition itself. To evaluate the experiences it's important to define some classification criteria; a classification system can be based on what is shared: time, space, work.

#### 4.1 Sharing the time

In this case the s-composition are planned on a timeline. An example is the writing of a collective story; it is an extension of the game that child are used to play when they invent a story: starting from a prior event, the first player adds a fragment to the story and the second one start from the previous end and goes ahead with another fragment and so on.

The ability of the player consist in introduce small overturn, coup de theatre and in being able to raise the story to a conclusion. The mechanism itself, actually, if it is not under control can produce a no-sense story.

A collective story can even become a book, in fact there are already some collective book also in the best seller lists.

#### 4.2 Sharing the work

In this case the distribution of the work consist in a collaborative division based on competences, such as the cases where more and different competences are necessary in order to finalise the work.

An example is the project of architecture where more professional figures are called to coexist: the designer coordinates the general organization and entrust sub-system and portion of work to different expert from different field (structure, heating system, wiring, etc.). Sometimes the different experts can work together inside a system in parallel and the design coordinator checks the overlapping.

#### 4.3 Sharing the space

This type of classification is referred to that cases in which there is a division of the working space in order to collaborate. If the working space is a *tabula* or a canvas, as in our case, we can divide the working area of the canvas with a grid and obtain smaller and equal rectangular plugs that we can distribute to participant.

There are some best practice that uses this technique: the on line fresco processed by *Phase X* by *ETH*, which produced a kind of bidimensional development of the founder of the collaborative game based on space sharing: *exquisite corpse* by surrealism. Other best practice, even if the expressive power is smaller, have added a third dimension using a kind of matrix (*SITO -Synergye*) or have extended the space to an unlimited territorial dimension (*Communimage*).

The key themes of all these best practice are: boundary problem, boundary relations, dimension (two or three dimension)

#### 4.4 Sharing layers

Sharing layers can be considered a particular case of sharing the space, a kind of extension of the two dimensions. CAD software and image processing software are used to work with metaphors of transparent layers. [fig 7] We could consider the case, already used in some of our Games, of a layer per each participant. This stratify can be applied to an unlimited canvas or to a canvas which fall back such as a cylindrical panorama. For example a couple of Japanese artists developed a panoramic canvas with their *Renga project*: all the participant can spread and overlap portion of draws on the canvas. [fig 8]

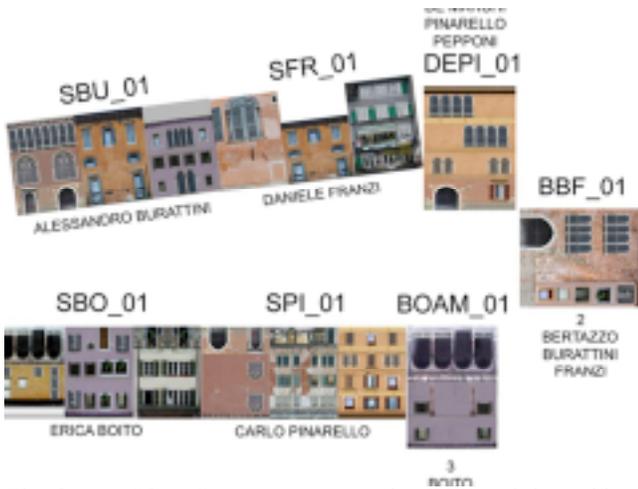
### 5. DESCRIPTION OF THE COURSE “GAME”

In the field of each Course the “Game” has been the main element for the experimentation of the procedure of definition and sharing of rules and shape grammar, the technique and the collaborative strategy, the communication tools. The aim of the “Game” is to teach to the students the technique to work together both by the enunciation of theory and both through

the practice and the experimentation of technique that take into account actors, rules, phases, goals.



the composition of a painting starting from the s-composition of a painting by Juan Mirò.



The Course “Game”, as every game, is composed by a kit, a goal and some rules. A particularity of the “Game” is that two operational models coexist: the first is the “paper” model that is carry out in presence and is metaphor of the second, the “informatics” model that is carry out by a distance (or by a simulation of a distance). During the various edition of the course some transformations and revision has been made and the goal of the “Game” has been the composition of an abstract opera starting from an outline, the s-composition and composition of a Venetian façade or a town district starting from a set of photos of façade,

All the Courses has been quite short: 30 working hours in presence and in other courses by a distance. The Course of may 2006 has been completely on line and the previous course has been in presence and lots of the distance activity has been simulated.

In order to get quickly to the centre of the content, the first day of Course is about a “paper” simulation of the informatics tools that will be used in the next days. Paper, overhead projector, scissors, glue, post-it are easy and agile

technologies that allow to access immediately to the metaphor of an informatics system.

### 5.1.1 Operational functioning

The “Game” goes on following a cyclical sequence: after the definition of the goals, some step are repeat since a satisfying configuration is reached or since the available time is over.

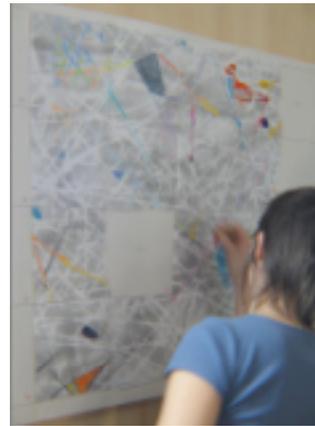
1. Definition of assignment goals
2. Discussion
3. Paint processing
4. Collective evaluation
5. free discussion
6. it's over?
  - Yes – Go out from the cycle and publish your result
  - No – Go on with annotations of individual advice and go back to point 2

The circular process of the “Game” allow to mix individual elaboration and a shared comparison and evaluation. Beside the process allow to balance two needs: the need of steady comparing the progress of the work with the goals and the need of let everybody free of follow the persona creative process. It is the look for a balance between individual expression and group activity.

## 5.2 The object of the “Game”

### 5.2.1 The Tabula

The *tabula* represents the centre of the action. The *tabula* is a working canvas that shows to everybody the opera in progress, the annotation, the advice, the main structure, the history of the generative process. The representation system of the *tabula* is two dimensional and this characteristic could appear



unusual because apparently force to give up a third dimension, which is an important win of the computer aided design. We choose to work in two dimension because it allow to condense a big amount of information inside a well defined code system if compared with the 3D representation which always has the characteristic of a view.

During the “Game” we put on the *tabula* the draw master, the image that express the synthesis of the common work. It is the place opposite to the individual laboratory; both the *tabula* and the draw must be accessible and simultaneously under control with a “coup d’oeil”. The functioning of this “coup d’oeil” is different if we are in a context of a physical classroom or if we are on line, but in any case we still need to control the generative process of the opera. “In front of” the *tabula* and “around” the *tabula* are concentrated discussion and evaluation; “on” the table, instead, are noted the exchange of advice between students in a physical way (through post-it to stick on the *tabula*) or in a

digital way (through post-it to save with the digital file of the *tabula*)

### 5.2.2 The catalogue

The catalogue gather the images that represent the source and the starting materials. The catalogue is composed by images that can be withdraw and s-composed according to personal or shared criteria; if an analogy between structured images and text can be done, we can declare that the catalogue of images is a collection of text where we can apply some s-composition criteria.



### 5.2.3 The repertory

The function of the repertory is to be a kind of bank of images extract from a catalogue. To place an image in the repertory means to publish the image, to put it available for a collective use and to certify to be the author of that selection. The draw in the *tabula* is composed from the element in the repertory. The repertory is the key of all the operations of composition and can be more articulates if we introduce levels. In the realisation of the “Game” about the small square, for example, we tried to define an equivalence between text – sentences – words and groups of façade – façade – hole: the hole are pictures of doors or windows and the group of façade is the whole text.

The action of insert a figure in the composition involve another key set of decision: once we have derive a figure as the result of a s-composition, it is possible to transform the figure again with a geometrical or chromatic transformation before the placement in the repertory. *Which are the limits of a transformation before the figure become unrecognizable?* Also this kind of boundary can be part of the expressive path; we can have two extreme cases, in the first we can only move or rotate the figures as it happens with magnetic figures or puzzle, in the second we can process figures with any kind of transformation in the respect of the nearness relationship, like the figures are made of rubber.

### 5.2.4 The personal laboratory

The personal laboratory is opposite to the common space and represent the location where the personal elaboration take place. The personal laboratory can be the desk where the student works in order to cut and compose or it can be the space in the student’s personal computer. From the personal laboratory it is possible to communicate with the other

member of the group through a forum (“paper” forum or “web based” forum).

### 5.2.5 The Forum

The forum is the only communication system allowed during the individual composition phase. During the first day the forum is simulated by a long transparent paper on a overhead projector and in the successive days we use an open source forum available on line.

## 5.3 Leading the “Game”

### 5.3.1 Start up

During the first day of the Course we show the goals and the method of participation and we also carry out the “first movement” of the “Game”. The “first movement” is in presence, using non-informatics instruments (paper and coloured pencils) and consist in a part of the elaboration of the *tabula*. The rest of the elaboration is carried out by a distance, using information and communication technologies.

The “Game” is composed of phases. The first phase is the enunciation of rules, elements and gola of the “Game”. The first element is the first shared rule: the title.

### 5.3.2 Goals of the “Game”

The goal of the “Game” is to elaborate the theme and to express a dialogue between individuals and group.

### 5.3.3 Phase 1: Discussion

After the definition of the title, there is a free discussion oriented to formulate the first hypothesis about how to go on, how to interpret the title, which possibility to carry out, which guide ideas.

During the game we organised, we used different criteria for the space sharing: the division in portions during the game “*ETH on paper*” (2004), the division in plot in the game “*urban quarter*” (2005, 2006), the division in layer in “*a false Mirò*” (2006)

During the first editions we introduced one or two pre-games, but due to the short time of the course it is more successful to immediately start with the definitive “Game”.

The conclusion of the discussion represent the start up of the second phase of creation and elaboration.

### 5.3.4 Phase 2: Elaboration

The second phase represent the individual activity.

Inside his/her individual laboratory (the desk, the office, the computer), each student chose some images from the catalogue, elaborate them, extract some figures and publish them in the repertory. The selection of images is finalised to insert some figures in the whole composition.

In this phase the more relevant aspects are the personal sensitivity and the personal skills of the students that decide how take into account the common direction and how to practice his/her knowledge about shape grammar.

The composition goes ahead inserting in the personal paper the figure chosen from the repertory and transformed in a suitable way. In the beginning the students aims to publish and use only their own images, later on we establish some minimum percentage of use of the figures produced by the

others, in order to favour the exchange of materials. In any case, while the games goes on, everybody realise that it is important to quote the figures from the other or the transformed figures from the other in order to reach to a harmonious result.

The figures that comes form the repertory and is insert in the canvas can be transformed as position, dimension, can be deformed or re-coloured. To define limits to the transformations means to define the field of existence of the element, over the defined limits it is necessary to define a new element.

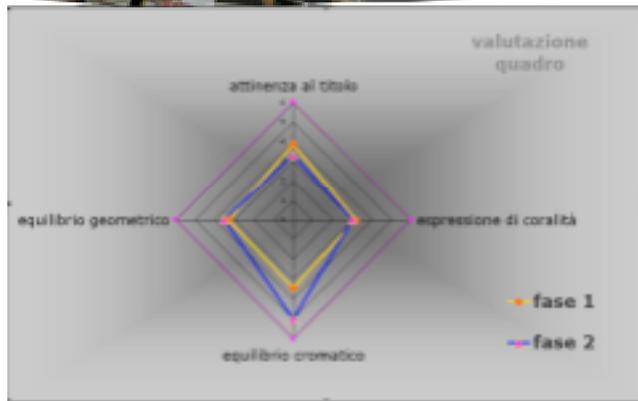


In such a way the *tabula* works as a collector of information even in the mid-phases, when the project has not an high level of formalisation but is necessary a kind of control. This control became very important when we are working in parallel, as it happens with a collective opera.

It is possible to draw an informatics system that allows a real time update of the common canvas, after each move. However we did not follow this possibility because of technical limits and also because we are not completely sure that the best solution is a synchronic system that could reduce the phase of individual thought.

### 5.3.5 Phase 3: Discussion ad collective evaluation

The assessment and the evaluation of the compositive process is carried out through a formal evaluation – the vote – and an informal evaluation – the discussion.



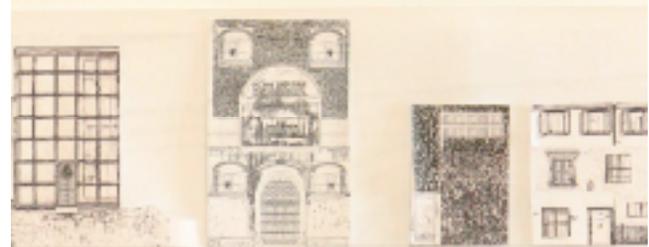
The group evaluate the effectiveness of the compositive process and express a score referred to some parameters, for instance: relevant to the title, coral expression, chromatic balance, geometrical balance.

The evaluation could be done by a different group from the groups of authors (for example the public or the critics). In our game the judgement has been expressed by the authors themselves because of the small group of participant, and the synthesis has been expressed by a radar diagram.

Express a judgement about the opera it's not a relaxed and sure activity. As far as aesthetics category and personal sensitivity are taken into account, the risk of confusion is high. Anyway this melting pot of judgement, sensitivity and comparison are the more precious resource of a collaborative work.

The following discussion start form some remark about the vote and is aimed to ask for consideration on the performance as a whole.

The evaluation express the progress of the opera and all the remarks are the indication of what correction are necessary in order to raise up the collective aspect of the composition.



Collective Drawing evolution from paper to computer

### 5.3.6 Phase 4: Remarks

The remarks phase carry out the function of advice for the single user. Each participant can insert on the canvas a free number of notes, in the mood of understand the tendency raised up from the discussion. From an operational point of view, participants use a set of post-it addressed to the portions of draw that should be modify. Each post-it has the name of the author inside and the whole system become a kind of visual forum.

As it happens in a forum, often too rich of messages, the abundance of annotations draw to a drastic decrease of the time and the attentions spent in reading the annotations, and it was necessary to insert an editing activity.

There is a sort of critical threshold that, when surpassed, makes the number of annotation unfriendly because there are lot of redundant information and everybody tends to read only the annotations addressed to his/her work.

One everybody take notes of the annotations or of the synthesis of the annotations done by an external moderator, everybody begins again to work on the personal figure.

The "Game" goes ahead with a new composition phase, that can be made of new insert or, mainly, by transformations of element already present on the canvas.

### 5.3.7 Phase 5: Conclusion of the "Game"

After a few number of match, according to the time available or according to the quickness of the participants, the "Game" finishes with a last general evaluation.

In our games we went over from two to five matches.

## 6. FUTURE PURPOSE AND POSSIBLE DEVELOPMENTS: A WORKING HYPOTHESIS FOR ON ON-LINE GAME

The experience we have described above, aimed to create and implement a knowledge system composed by formal rules,

shape grammar, sharing systems and evaluation systems that comes from the experience gather during the courses.

Since now the experience have given information about the critical issue and the potentiality that comes form the association between figurative building and use of technique for the collaborative work.

Next steps could be:

explore different composition spaces, for instanced connected to the use of a cylindrical support in order to produce a collective panorama;

investigate on the effect of the simultaneity on the collaborative composition.

In order to go into more depth study, it would be important to draw an on line environment to support the activity.

The future purpose could be a game opened to a wider audience, composed by international students localised in different University.

In the end, a list of possible application field:

The didactic of courses about the Art History;

Attention game inside the museum;

Courses of composition of imager or architectural composition;

Processing of collective figurative opera;

Collaborative development of design and project ideas.

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