48-747 Shape Grammars

THE PALLADIAN GRAMMAR
analytic shape grammars are intended for a particular style

criteria for authoring a successful analytic grammar for style were spelled out by Stiny and Mitchell

clarify the underlying commonality of structure and appearance manifest for the buildings in the corpus;

supply the conventions and criteria necessary to determine whether any other building not in the original corpus is an instance of the style; and

provide the compositional machinery needed to design new buildings that are instances in the style.

language → style ← shape grammar
Andrea Palladio I Quattro Libri dell’ Architettura

*The Four Books of Architecture*, tr. Issac Ware, 1737


**the sources**
“And though variety and novelty may please everybody, one should not, however, do anything that is contrary to the laws of this art, and contrary to what reason makes obvious; so we can see that the ancients also made variations, but they never departed from certain universal and essential rules of this art, as we shall see in my book of antiquities.”

**Andrea Palladio**, *The Four Books on Architecture*, pp 56
tr. Robert Tavernor and Richard Schofield
exemplar – the villa Malcontenta
stages in shape grammar

grid definition
exterior wall realignment
room layout
interior wall realignment
principal entrances-porticos and exterior wall inflections
exterior ornamentation- columns
windows and doors
termination
the stages pictorially
A vicentine foot

“This line with which the following buildings are measured is half a Vicentine foot [piede vicentino]. The foot is divided into 12 inches and each inch into 4 minutes [minuto]”

Palladio, pp. 79
“Rooms [stanza] must be distributed at either side of the entrance and the hall, and one must ensure that those on the right correspond and are equal to those on the left so that the building will be the same on one side as the on the other and the walls will take the weight of the roof equally; ...”

Palladio, pp. 57
1. the rules for generating a tartan grid
“There are seven types of room that are the most beautiful and well-proportioned and turn out better; they can be made circular [ritundo], though these are rare; or square [quadrato]; or their length will equal the diagonal of the square [quadrato] of the breadth; or a square [quadrato] and a third; or a square [quadrato], and a third; or a square and a half; or a square and two-thirds; or two squares.”

1. grid definition
2. exterior wall definition
3. room layout

Figure 7. Rules for room layout.
3. room layout

Figure 8. Generation of the room layout for the Villa Malcontenta.
4. interior wall realignment

Figure 9. Rules for realigning interior walls.
5. principal entrances
porticos and inflections
5. principal entrances

portico in antis

portico prostyle
5. principal entrances

a second portico *in antis*
5. principal entrances

Figure 11. Generation of the portico and wall inflection for the Villa Malcontenta.
“Now that we have talked of walls by themselves [muro semplices], it is appropriate to move on to their ornaments, of which columns, when located properly and in proportion to the whole building, are by far the most important that can be applied to a building.” (pp. 17)
7. windows and doors

Figure 14. Rules for locating windows and doors in villa plans.
7. windows and doors
8. termination

Figure 16. Termination rules.

Figure 17. The final plan generated for the Villa Malcontenta.
real or fake?