

RE-INVENTING PORTUGUESE CERAMIC TILES:

Shape grammars as a generative method and its impact on design methodology

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This poster focuses on the results of the workshop ‘Re-inventing Portuguese ceramic tiles: Using Shape Grammars (SG) as generative method’ that took place in Porto University School of Architecture, Portugal, in April 2013. The main goal was to use SG as a design methodology for the creation of bi-dimensional ceramic tile patterns. SG were also used to analyze and describe the designs and produce new solutions.

The workshop was carried out in one day, and it was divided into 4 main stages: 1) Introduction to SG, 2) Creation of a new SG to generate ceramic tiles patterns. 3) Rule extraction and SG inference. 4) Creation of shape rules to convert the bi-dimensional SG inferred to a three-dimensional one.

In Stage 2 amongst the different groups diverse solutions and grammars were originated despite the initial limitations and the pre-set lexicon of shapes that did not inhibit design and creativity. Most rules developed by the participants were clearly segregated between design rules and tiling rules. Figure 1 and 2 show the work of two teams which started with the same method of experimenting different spatial relationships but developed differently – Team A to an addition strategy followed by subdivision rules, Team B used both addition and subdivision rules and add deletion rules.

In Stage 3 participants were presented with pre-existing patterns, invited to infer a grammar by extracting shape rules observed through design patterns – for comparison purposes the same image was provided to two teams (Figure 3 and 4). This task was important to test how different participants would propose rules to describe the same body of work. Team A showed a deep concern by the shapes and patterns to be illustrated and had more difficulties exploring the shape grammar methodology resulting into a more extensive set of rules. Team B embraced shape grammars formulae and experimented with labels which resulted into an elegant, concise and descriptive grammar.

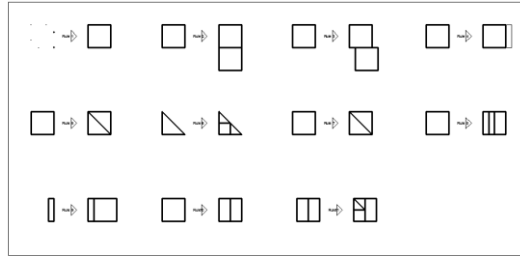
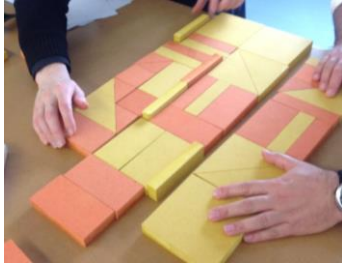


Figure 1: Team A, stage 2 - (left) pattern, (right) shape grammar

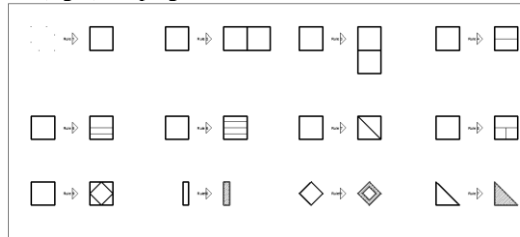
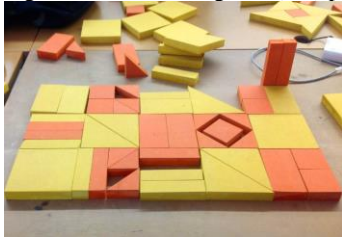


Figure 2: Team B, stage 2 - (left) pattern, (right) shape grammar



Figure 3: Ceramic tiles pattern as provided to Team A and B from which they had to infer the grammar, stage 3.

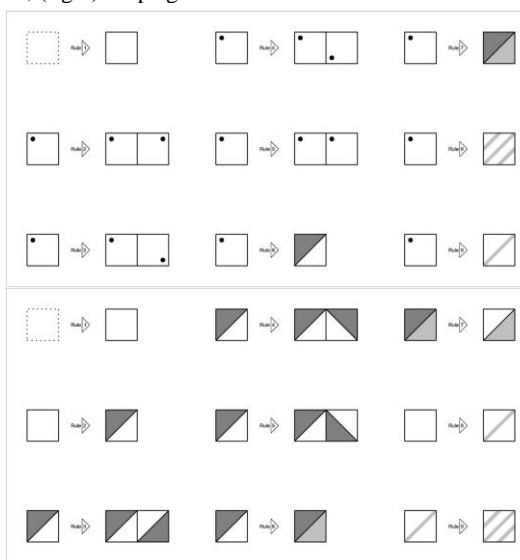


Figure 4: Inferred shape rules, stage 3 – (top right) Team A, (bottom right) Team B

The results achieved by both teams revealed important issues: i) SG methodology allows for more than one grammar to describe the same body of results or design languages; ii) restrictive and descriptive grammars allow for a level of precision useful to replicate an existing body of work; iii) unrestrictive grammars allow for useful design exploration by setting specific design principles but not over restricting outcomes; iv) descriptive SG result into an extensive set of rules; v) the use of labels can aid in the optimization of SG and result in an elegant, concise and intelligent grammar; vi) more than one SG can prove feasible responding to the problem formulated.