

Letter Spirit: Modeling Creativity in a Visual Domain

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Introduction

The Letter Spirit project seeks to develop a computer program that models typeface design in the domain of a 3 by 7 grid. The program will start with seed letters in a gridfont and design the remaining lowercase roman letters in a consistent style. A portion of a sample gridfont is displayed at the top of this abstract. The domain and project were originally proposed by Douglas Hofstadter (1985). All processing is completed by four modules, which divide the work to be done according to phases of the design process. The first, the Examiner, has a robust working implementation developed by Gary McGraw (1995) and honed by John Rehling (1997). The Examiner decides upon letter category for a given gridletter, and its task is similar to that of an optical character recognizer. The Adjudicator also evaluates a gridletter, but handles the complimentary task of resolving the style used in the gridletter's rendering. The Imaginer is the module which makes decisions about the abstract properties of a new gridletter being designed. The Imaginer knows nothing about the grid, but may select among possible role conceptualizations, and select some properties of the eventual role filers. Finally, the Drafter begins its work where the Imaginer leaves off, and turns the abstract plan for a letter into an actual letterform on the grid. An artist needs to be a good appreciator of art because review and revision are an essential part of the creative process. The alternative, an impeccable ability to proceed from first principles to high-quality work, is unlikely to be found in either human or machine creativity, and there is great power associated with the ability to review and revise (Boden, 1990), (Schank & Childers, 1988). An important idea behind the four-module organization of Letter Spirit is that there is a central feedback loop of creativity — that any candidate letter created by the Imaginer and Drafter will be evaluated by the Examiner and Adjudicator to make sure that it is acceptable, both with respect to the intended letter category and the style of the other letters.

Work In Progress

The Examiner's style of processing, related to that seen in the Copycat (Mitchell, 1990) and Tabletop projects (French, 1992) is being carried over to the Adjudicator and Drafter. In each, all activity is carried out by running codelets, short

pieces of code, any one of which performs only a small part of the overall task. Individual codelets may represent different high-level pressures — to see the input as a certain letter, to look for a certain stylistic property, or to opt for a particular decision in the graphical rendering of a new letter. One by one, codelets are selected in nondeterministic order and removed from their repository (the coderack) in order to be run. Because no codelet performs too large a role by itself, an implicit parallelism mediates between interacting pressures, many of which will influence the final product. Besides modifying the data structures of the program, codelets also post new codelets, thereby allowing trends in the processing to perpetuate themselves.

This work is meant to explore the architectural ideas that have worked so well in the Examiner by extending them to the other modules. In addition, the simple high-level control of this implementation, which effectively runs the modules separately while allowing virtual parallelism within each module, will form a starting point for possible exploration in more complex forms of control in models of perception and creativity.

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