Letter Spirit: An Architecture for Creativity

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Introduction

The Letter Spirit program is a model of human creativity in the domain of typeface design. The task of Letter Spirit is to take as input a few gridletters, letters rendered on a medium-resolution grid, that are intended to represent the same style. Using those seeds as a beginning, Letter Spirit creates versions of the remaining lowercase letters of the roman alphabet until it has completed an entire *gridfont* of 26 stylistically consistent gridletters.

Approach

Letter Spirit consists of three modules, each being a relatively complex program solving a vital subtask of gridfont design. The three modules are all based upon an architecture common to the cognitive models implemented by the Fluid Analogies Research Group. Most of those projects, including Copycat (Mitchell, 1993), Tabletop (French, 1992), and Metcat (Marshall, 1999) aimed at implementing increasingly refined models of analogy. One of the Letter Spirit modules (McGraw, 1995) pursues a similar approach, although its task is gridletter categorization rather than analogy.

The Letter Spirit program has a top-level loop that coordinates the three modules into a single strategy of design called *review-and-revision*. The program has one module, the Examiner, that detects letter category, while the Adjudicator evaluates style, and the Drafter, which creates new gridletters that aim to represent a goal letter category and that style.

To get around the brittleness that afflicts many AI models, Letter Spirit hands the Drafter's output to the other modules and they rate each gridletter for how well it fits its intended letter category and the intended style, respectively.

The design phase of a Letter Spirit run thus amounts to the execution of a loop, in which a letter category is selected and then the Drafter renders a gridletter that, ideally, incorporates the goal style as well as that letter. The Drafter's attempt is run past the Examiner and the Adjudicator, and if the attempt is the best version thus far for that category, as determined by the scores that the Examiner and the Adjudicator generate, then it is kept as the current version of that category in the gridfont. This loop runs many times, and as it does so, the quality of the gridfont should incrementally increase.

Results

Figure 1 shows five gridfonts that resulted from runs that each began with the program receiving five gridletters (in each case, 'b', 'c', 'e', 'f', and 'g') as input.

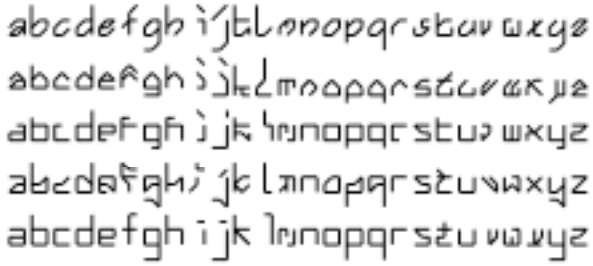

Figure 1: Five Letter Spirit-designed gridfonts.

While the Letter Spirit program captures human creativity, at best, partially, it is our belief that the model captures many essential aspects of human creativity. Perhaps more important, we argue, is the opportunity that the output provides to identify shortcomings in the current approach so that future models of creativity can converge more closely upon human creativity (Rehling,. 2000). More detail is at www.cogsci.indiana.edu/farg/rehling/lspirit/thesis

References

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