ON TAILORING THE DRAWING SYSTEM FOR VARIOUS STYLES AND PRACTICES IN DESIGN

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EXTENDED ABSTRACT:

Graphic reasoning using drawings as a representation are major activities applied to most design problems. Unfortunately, current computer-aided drafting systems work well only as drawing production machines. Very little emphasis has been placed on how to make systems that support graphic reasoning or that can be tailored to meet various ways of drawing production for different applications, or even, for individuals within the same profession. To be more specific, a drawing may be entered or defined with very different decision sequences, thus, different ways of producing the same drawing should be available. Also, different applications tend to manage different abstract objects, e.g. *graph*, *list* and *tree* in computer science; *window*, *wall* and *column* in building design. A good drafting system should be responsive to the need of incorporating different styles in producing drawings and the desired logical relations of the abstract objects.

In an earlier paper[1] the author presented a well-formed set of primitive operations for an open-ended geometric constructions which operate on line entities of different types (straight, arc and conic). Those operations can be extended to almost any geometric manipulation on the drawings produced by current 2-D drafting systems. Because of the constructive nature of this approach, the system does not require inclusion of many operations which are not frequently used. Also, end-users are provided with an extensible environment to apply their knowledge of how their tasks may be done, by defining new operations. The problem is that most current systems do not respond to the user's expectation and as a consequence the user has to accept the drawing commands passively and live within a fairly fixed setting.

This paper presents a set of drawing tools and a mechanism to construct high level tools in an homogeneous operating environment for engineering drafting. This computing environment includes drawing tools with their minimal semantics, and users can add more semantics to the operations later on. The demand for an open-ended set of drawing operations can be built up in this setting, and various requirements of operations for different applications can be tailored with the desired semantics. Beyond pure drafting, it can be further extended to perform analysis on the drawings which model the design.

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[1] Liu, C.K. and Eastman, C.M. "Design of a Graphic Processor for Computer-Aided Drafting." In *Proceedings of the 19th Design Automation Conference*. Las Vegas, June, 1982.