Software for Systematic and Imaginative Exploration

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Motivation

"to construct 100 DIFFERENT FIGURES from the same information requires less imagination than patience."
-- Jacques Bertin

Selecting amongst these variations requires judgement, which may differ between users. Many variables, including task, can affect this judgement.

"art is a matter of 'judgment – not calculation.'"
-- John Whitney, Sr.

Boden distinguished between H-creativity (historical) and P-creativity (personal), depending on whether the item is new to society or only new to the individual. Both, or neither, may apply to any one alternative. P-creativity is important because it means that the individual is inventing.

"This is my approach, so that finally I know, in any case, of only one inventor, who is myself."
-- Jacques Hadamard

When the 100, or 1,000,000, alternatives are available in a software application, the user must become an expert in the software tool in order to access them - and such expertise might be hard to maintain. Immersion in the command syntax of a tool may alter one's semantic view of the problem at hand.

Patience is a virtue that is in decline in modern society. If software required less patience than imagination, could it help to democratize creative visual thinking and could it help to cultivate and sustain creativity?

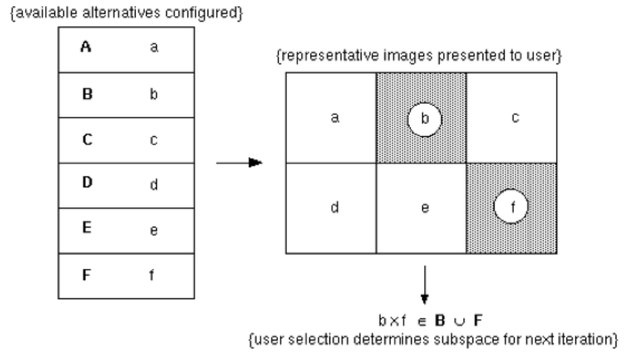
In 1960, human-computer symbiosis would augment people's own capacities.

"...those years should be intellectually the most creative and exciting in the history of mankind"
-- J.C.R. Licklider

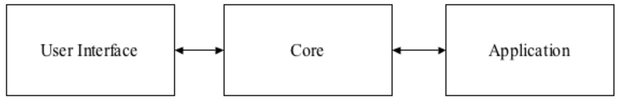
Architecture

cogito is designed to facilitate, through interactive articulation and evaluation of visual representations, each user's own judgment -- while requiring less patience than a manual approach.

cogito augments the user's ability and shares responsibility with the user. Sims and other inspirations embody "interactive evolution": allow user to direct search of visualization parameter space by iteratively selecting complete visual representations. Permits user to see breadth of what is available.



Interchangeability is the main premise of the *cogito* architecture -- achieved by the separation into 3 distinct units:



User interface: implements exploration, renders display, responds to user's interaction, encapsulates user's conception of problem

Core: implements the main functionality, manages the contents of each cell on the display by invoking the manual visualization application with appropriate arguments,

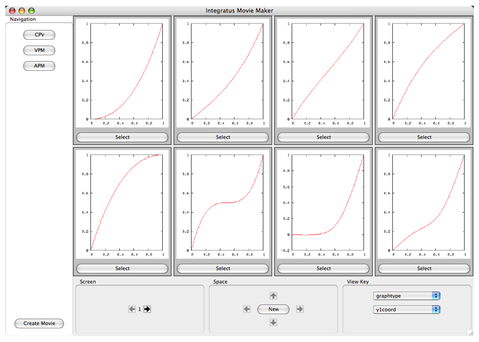
Application: provides the abstract interface by which *cogito* can communicate with manual visualization tools

Results and Future Work

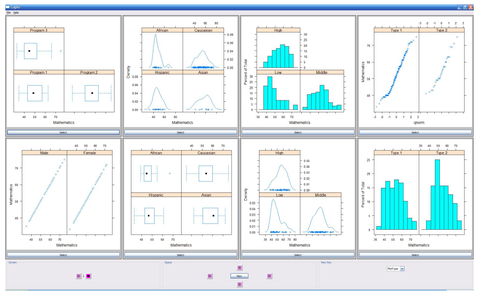
Adapting the *cogito* interface to these applications was straightforward. In the future, the output from these separate applications could be made available at once, allowing the user to maintain the same conceptual view of all the tools.

cogito shows promise as a way to train users in a new application: the complete capabilities of an application need not be understood before this interface can be attached and the application can be explored.

Software and user studies are being developed to test this hypothesis.



GNUplot



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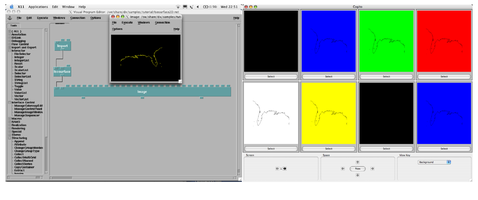

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