Computational Artistic Creativity and its Evaluation

DAVID C BROWN

Computer Science Department

WPI, Worcester, MA 01609, USA

<dcb@cs.wpi.edu>

Motivation

"What are the appropriate methods and measures to objectively verify and validate creative behavior in artificial systems?"

- Evaluation by *people*
- Evaluation by *computational system*

- Evaluation of *artifact*
- Evaluation of *process*

Your Research Goals?

1. Producing creative artifacts using computational means.
2. Study what knowledge and reasoning might be part of process that produces creative artifacts.
3. Study the criteria that a person or a system might use to judge whether an item is creative or not.

Your Research Goals? (continued)

4. Produce a formal theory of creativity.
5. Produce new “computational means”.

Creativity Evaluation

- How to judge impact of decision or quality of partial solution during synthesis?
  - E.g., using constraint to reduce search space
- How to judge artifact (or its description)?

Necessary or Helpful?

- Is it *necessary* for system to evaluate during synthesis and/or evaluate the resulting artifact?

- If not, is it *helpful*?

Criteria?

What *factors* are used to evaluate creativity?

Examples

- Besemer has 3 factors in the Creative Product Analysis Model.

- Abrams has 4 ways of considering the analysis, criticism or evaluation of art.

Besemer's CPAM: Creative Product Analysis Model

- Factors: *Novelty*, *Resolution & Style*
- Novelty: newness
  - Surprising, Original
- Resolution: meets needs
  - Logical, Useful, Valuable, Understandable
- Style: refined, developed, coherent whole
  - Organic, Well-Crafted, Elegant

Abrams

- *Mimetic* - imitating aspects of the observable universe, but not artifact, artist or audience.
- *Pragmatic* - the relationship between the artifact and audience, including teaching & producing emotional reactions.
- *Expressive* - externalizing artist's inner life.
- *Objective* - viewing artifact in isolation.

- Combinations are possible.

Some Computational Challenges

- Surprising: what is “normal” art?
- Useful: what is purpose of the artifact?
- Valuable: knowledge of art market?
- Understandable: user friendly art?
- Pragmatic: does it provoke emotion?
- Expressive: artist’s “inner life”?

Overall Challenge

A Computational Artistic Creativity system must be able to evaluate its own output for creativity, and be able to evaluate its decisions and partial solutions for creative potential.

Conclusions

- For Computational Design Creativity systems that design products I think this is possible.
- For Computational Artistic Creativity systems I have very grave doubts.