Conceptual Blending in Computational Concept Creation

Amilcar Cardoso
Autumn School on Computational Creativity, 2013[1]

Main Bibliography:

The book where the Gilles Fauconnier and Mark Turner proposed the Conceptual Blending theory:

- Fauconnier, G. and Turner, M. (2002). The Way We Think. New York: Basic Books.

The book where Francisco Pereira presented a computational approach to conceptual blending:

- Pereira, F. (2007). Creativity and artificial intelligence: a conceptual blending approach. Berlin: Mouton de Gruyter

This book was based on Pereira's PhD Thesis, available here:

- Pereira, F. (2005). Creativity and artificial intelligence: a conceptual blending approach. PhD Thesis. University of Coimbra. https://www.cisuc.uc.pt/publication/show/3686

Other useful readings that will be referred in the presentations:

- Keane, M. T. and Costello, F. J. (2001). Setting limits on analogy: Why conceptual combination is not structural alignment. In Gentner, D., Holyoak, K., and Kokinov, B., editors, The Analogical Mind: A Cognitive Science Perspective. Cambridge, MASS: MIT Press. <http://bit.ly/17XaFkg>
- Veale, T. (2012). From Conceptual "Mash-ups" to "Bad-ass" Blends: A Robust Computational Model of Conceptual Blending. Procs ICCC 2012, 3rd International Conference on Computational Creativity, Dublin, Ireland, pages 1–8. <http://bit.ly/16TxtAo>
- Thagard, P. and Stewart, T. C. (2010). The AHA! Experience: Creativity Through Emergent Binding in Neural Networks. Cognitive Science, 35(1): 1–33. <http://bit.ly/Nwf70m>
- Li, B., Zook, A., Davis, N., and Riedl, M. (2012). Goal-Driven Conceptual Blending: A Computational Approach for Creativity. In Proceedings of the 3rd Int. Conference on Computational Creativity, ICCC-12, Dublin, Ireland. <http://bit.ly/1bkCnbj>
- Brandt, L. and Brandt, P. A. (2005). Making sense of a blend: A cognitive-semiotic approach to metaphor. Annual Review of Cognitive Linguistics, 3(1):216–249.

Extended Bibliography:

- Barnden, J. A. (1999). An implemented system for metaphor-based reasoning, with special application to reasoning about agents. In Nehaniv, C., editor,

[1] Supported by Project PROSECCO, funded by FET.

Computation for Metaphors, Analogy, and Agents, Lecture Notes in Artificial Intelligence, volume 1562, pages 143–153. Springer.
- Boden, M. A. (1990). The Creative Mind: Myths and Mechanisms. Weidenfield and Nicholson, London.
- Brandt, L. and Brandt, P. A. (2005). Making sense of a blend: A cognitive-semiotic approach to metaphor. Annual Review of Cognitive Linguistics, 3(1):216–249.
- Costello, F. J. (1997). Noun-noun conceptual combination: the polysemy of compound phrases. PhD thesis: Trinity College, Dublin.
- Eliasmith, C. and Thagard, P. (2001). Integrating structure and meaning: a distributed model of analogical mapping. Cognitive Science, 25:245–286.
- Falkenhainer, B., Forbus, K. D., and Gentner, D. (1989). The structure mapping engine: Algorithm and examples. Artificial Intelligence, 41:1–63.
- Fauconnier, G. and Turner, M. (2002). The Way We Think. New York: Basic Books.
- French, R. M. (2002). The computational modeling of analogy-making. Trends in Cognitive Sciences, 6(5):200–205.
- Gagné, C. and Shoben, E. (1997). Influence of thematic relations on the comprehension of modifier-noun combinations. Journal of Experimental Psychology: Learning, Memory and Cognition.
- Gentner, D. (1983). Structure-mapping: A theoretical framework for analogy. Cognitive Science, 7(2).
- Goguen, J. (1999). An introduction to algebraic semiotics, with applications to user interface design. In Lecture Notes in Artificial Intelligence, volume Computation for Metaphor, Analogy and Agents. Springer.
- Guilford, J. (1967). The Nature of Human Intelligence. McGraw-Hill, New York.
- Hampton, J. (1997). Conceptual combination. In Lamberts and Shanks, editors, Knowledge, Concepts and Categories. Psychology Press.
- Hofstadter, D. and Mitchell, M. (1988). Conceptual slippage and mapping: A report of the copycat project. In Proceedings of the Tenth Annual Conference of the Cognitive Science Society. Hillsdale, New Jersey: Erlbaum.
- Holyoak, K. and Thagard, P. (1989). Analogical mapping by constraint satisfaction. Cognitive Science, 13:295–355.
- Hummel, J. and Holyoak, K. (1997). Distributed representations of structure: A theory of analogical access and mapping. Psychological Review, 104:427–466.
- Keane, M. T. and Costello, F. J. (2001). Setting limits on analogy: Why conceptual combination is not structural alignment. In Gentner, D., Holyoak, K., and Kokinov, B., editors, The Analogical Mind: A Cognitive Science Perspective. Cambridge, MASS: MIT Press.
- Koestler, A. (1964). The Act of Creation. New York:Macmillan.
- Lakoff, G. (1993). The contemporary theory of metaphor. In Ortony, A., editor, Metaphor and Thought, chapter 11, pages 202–251. Cambridge University Press.
- Lee, M. and Barnden, J. (2001). Cognitively plausible models of semantic processing. In Proceedings of SEMPRO-01. Edinburgh.
- Li, B., Zook, A., Davis, N., and Riedl, M. (2012). Goal-Driven Conceptual Blending: A Computational Approach for Creativity. In Proceedings of the 3rd Int. Conference on Computational Creativity, ICCC-12, Dublin, Ireland.

- Martin, J. H. (1990). A Computational Model of Metaphor Interpretation. Academic Press.
- Martinez, M., Besold, T., Abdel-Fattah, A., Gust, H., Schmidt, M., Krumnack, U., and Kuehnberger, K.-U. (2012).
- Theory blending as a framework for creativity in systems for general intelligence. In Theoretical Foundations of Artificial General Intelligence, pages 219–239. Atlantis Press.
- Martinez, M., Besold, T. R., and Abdel-Fattah, A. (2011). Towards a domain-independent computational framework for theory blending. Proc of the AAAI Fall Symposium on Advances in Cognitive Systems.
- Pereira, F. (2007). Creativity and artificial intelligence: a conceptual blending approach. Berlin: Mouton de Gruyter.
- Pereira, F. C. (2005). Creativity and AI: A Conceptual Blending approach. PhD thesis, University of Coimbra.
- Schwering, A., Krumnack, U., Kuehnberger, K.-U., and Gust, H. (2009). Syntactic principles of heuristic-driven theory projection. Journal of Cognitive Systems Reseach, 10(3):251–269.
- Thagard, P. and Stewart, T. C. (2010). The AHA! Experience: Creativity Through Emergent Binding in Neural Networks. Cognitive Science, 35(1):1–33.
- Veale, T. (1995). Metaphor, Memory and Meaning: Symbolic and Connectionist Issues in Metaphor Interpretation. PhD Thesis, Dublin City University.
- Veale, T. (2012). From Conceptual “Mash-ups” to “Bad-ass” Blends: A Robust Computational Model of Conceptual Blending. Procs ICCC 2012, 3rd International Conference on Computational Creativity, Dublin, Ireland, pages 1–8.
- Veale, T. and Keane, M. (1997). The competence of sub-optimal structure mapping on hard analogies. In Proceedings of the International Joint Conference on Artificial Intelligence. IJCAI-97.
- Veale, T. and O’Donoghue, D. (2000). Computation and blending. Cognitive Linguistics, Special Issue on Conceptual Blending.
- Wisniewski, E. J. (1997). Conceptual combination: Possibilities and aesthetics. In Ward, T. B., Smith, S. M., and Vaid, J., editors, Creative thought.: An investigation of conceptual structures and processes. Washington DC: American Psychological Association.