

Cognitive Resource Allocation Graph (CRAG): A Graph Representation of Human Cognitive Resources

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Dedicated to the memory of our friend Ralph Faudree.

Cognitive resource allocation graph (CRAG) can be constructed from human style of cognitive processing given a complex cognitive task to perform. Advantages of such graphic modeling includes, applying abstract and aggregate variables in cognitive models, modeling relationships which are not known with certainty, modeling complex relationships which are full of feedback loops, and the ease and speed of obtaining and combining different knowledge sources and of running different policy options. We consider CRAGs as qualitative models of a cognitive system, consisting of the variables of processes and cognitive resources as nodes and the causal relationships between those variables as edges of the graph. Due to fuzziness in cognitive processing, each resource is assumed to have more instances with a total probability of 1. Each instance maps the fuzzy probability values and forms a probabilistic dense bipartite graph.

Keywords: human cognitive processing, cognitive resources, bipartite graph, probabilistic graph;