Six Thinking Hats Heuristic Methodology: Towards a Fuzzy-Logic-Based Explanation

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1. Overview

- How do we enhance reasoning and decision making?

- In his widely used Six Thinking Hats book, Eduardo de Bono proposed a heuristic for this.

- This heuristic is based on separating different reasoning modes ("hats").

- In this talk, we show that his heuristics can be (at least partly) explained in terms of fuzzy logic.

- Fuzzy logic is a technique in which we explicitly associate a degree of confidence:
  - with each fact and,
  - more generally, each statement from our knowledge base.

- The degree of confidence is, usually, a number from the interval [0,1].

2. Natural First Steps in Decision Making

- Ideally, it is desirable to come up with a solution which about which we are absolutely sure.

- For that, we can only use facts and statements about which we are absolutely confident.

- This correspond to *white hat*.

- Often, such absolutely confident knowledge is not sufficient.

- In such situations, we need to also take into account knowledge in which we are less confident.

- This corresponds to *red hat*.

- In the red hat reasoning, we can use known solutions s to similar problems.

- Namely, we assume that the desired solution to the actual problem be close to s.

Overview

Natural First Steps in . . .

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3. Decision Making: Next Steps

- Sometimes, the red hat reasoning leads to success.

- In other cases, when using statements in which we have less confidence, we get confused.

- Indeed, for a proposal, we may have both arguments for and against the proposal to be a good solution.

- This confusion comes from the fact that in logic, we usually try to combine all the facts and statements.

- In case of confusion, it may make sense to separate them:

    – separately consider statements and facts which are "for", and

    – separately consider ones which are "against".

- After this, we reconcile the results.

- This corresponds to *yellow* and *black* hats.

4. Decision Making: Final Step

- Sometimes, the separation into "for" and "against" arguments works well.

- In other cases, it still does not work. In such cases:
  - instead of looking for solutions which are close to the known solution s of a similar problem,
  - we can try to looks for solutions which are explicitly required to be different from s.

- This can be done in different ways:
  - we can explicitly add a requirement that the solution is different from s, or
  - we can randomly perturb s into s' and require that the actual solution is close to the s'.

- This corresponds to the *green hat.*

Overview

Natural First Steps in . . .

Decision Making: . . .

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Metalevel

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5. Metalevel

- So far, we have described individual strategies ("hats").

- To successfully solve the problem, we need to switch from one "hat" to another.

- Thus, to successfully solve the problem, we need to decide:

  - when we give up on one "hat" and move to the next one, and/or

  - when we go back to the original "hat".

- The corresponding meta-strategy is what is called *blue hat*.

6. Acknowledgments

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7. Reference

Eduardo de Bono, *Six Thinking Hats*, MICA Management Resources, New York, 1999.