BOUNDED RATIONALITY AS USEFUL LIMITATION IN E-TEACHING

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- 7.1.2. Why *Chaoplexity?*
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7. Boundedly Rational Experimental model(s) for E2020 Targets

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- 7.4.3. Extrapolating Comparisons and Ratios, Not Numerical Mathematics

8. Implementing the Experimental Model for Visual Patterns

8.1. SERVICE VALIDATION REQUIRES A LESS COMPLEX APPLICATION DOMAIN

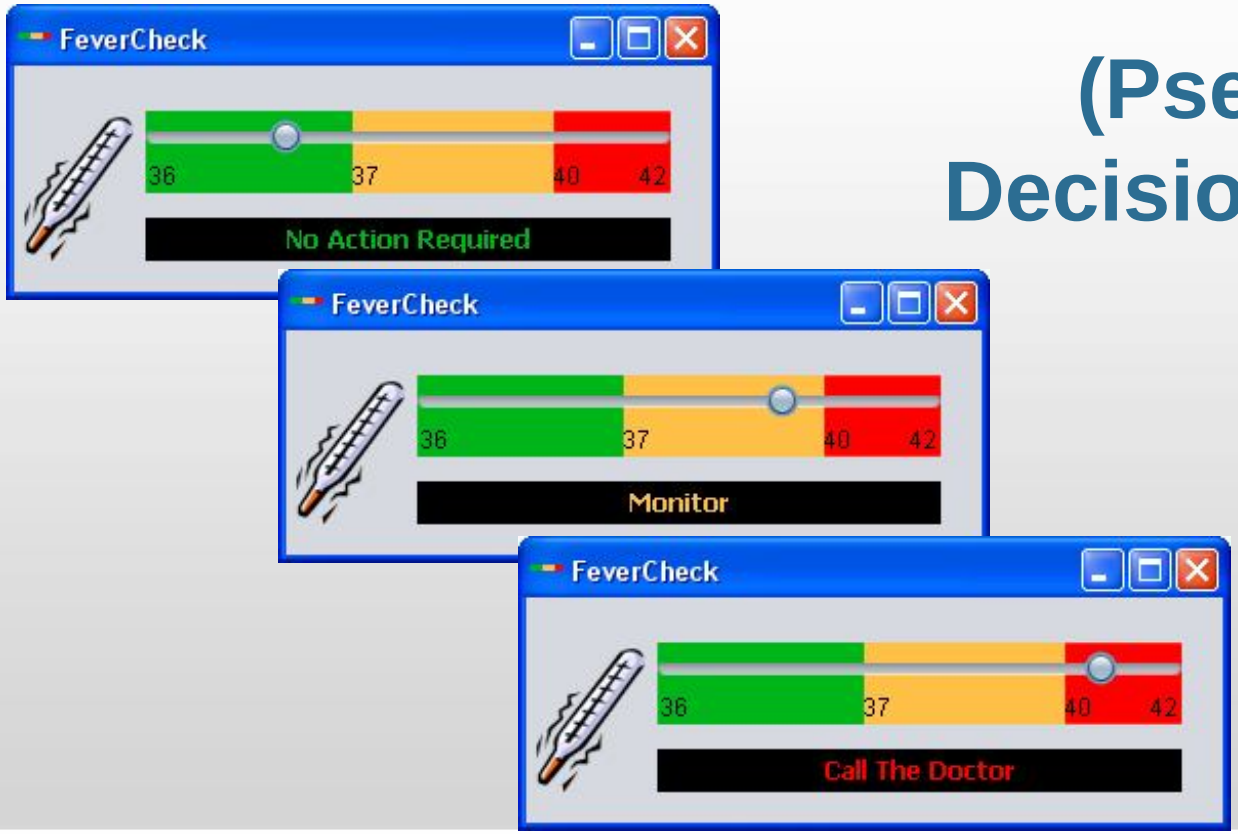
- 8.1.1. Why *Visual Patterns* Instead of *e-Teaching in Continuing Education*?
- 8.1.2. Why *Visual Patterns* Instead of *Visual Patterns Recognition?*
- 8.1.3. Inexorability and Basic Requirements of *Qualitative Validation*
- 8.1.4. Validation *in Embryo* (Mechanisms) and *in Ovo* (Toy Real-World Problems)

8.2. APPLYING WORD-BASED INPUT TO SIMPLE BUT URGENT DECISIONS

- 8.2.1. Defining a Child-Care Toy Problem
- 8.2.2. Design Space
- 8.2.3. Scope of First Prototype
- 8.2.4. Interface
- 8.2.5. Outline of the Second Prototype

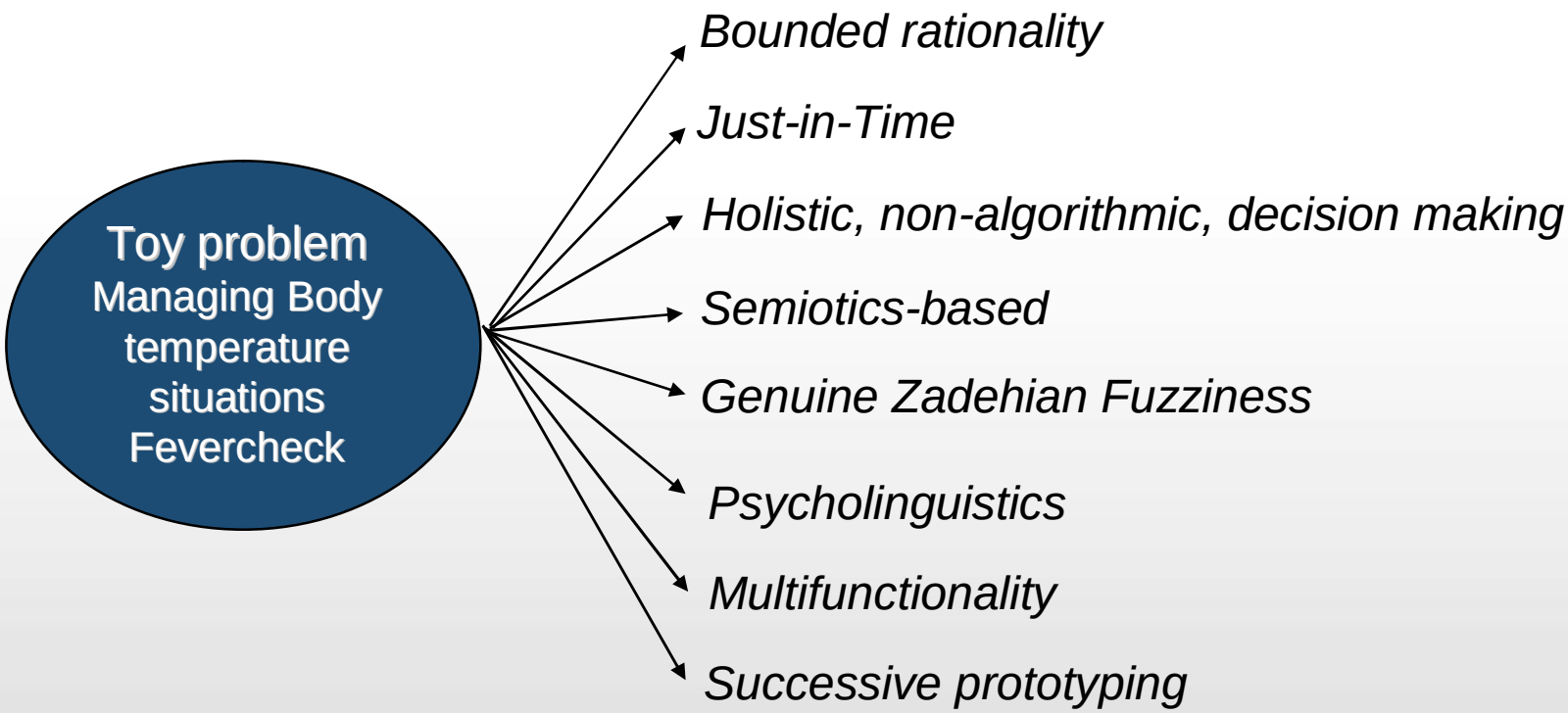
Decision-Input Bar

- **Decisional choices** are entered into the system expressed as *pixel segments* on (scrollbar-like) bars. The *segment length represents the choice variable value*.



(Pseudo)Linear Decision Input Bar

Toy problem – relevant as regards



Other (possible) DIB instances

- **Logarithmic**
- **Exponential**
- **Sigmoidal**

8. Implementing the Experimental Model for Visual Patterns

8.3. APPLYING DECISION-MAKING SIMULATOR TO SERVICE-ORIENTED DIALOG

- 8.3.1. Defining a Toy Problem about “Outlining Service-Requirements”
- 8.3.2. Design Space
- 8.3.3. Scope of First Prototype
- 8.3.4. Interface
- 8.3.5. Outline of the Second Prototype

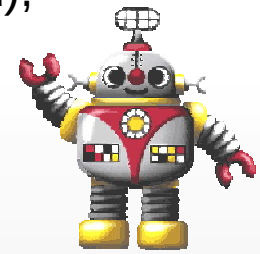
8.4. MERGING THE MECHANISMS IN VISUAL PATTERN RECOGNITION PROBLEMS

- 8.4.1. Choosing the Toy Problem Depending on Affordable Benchmarks
- 8.4.2. General Architectonic Framework
- 8.4.3. Components and Technology: IDE, Code Samples
- 8.4.4. Validating the experimental model

Decision making. Toy problem: Fevercheck

DECISION DOMAINS WHERE DECISIONS ARE FOR *SIMPLE SITUATIONS*

- automatic decision (if allowed),
- deterministic



Simple situations

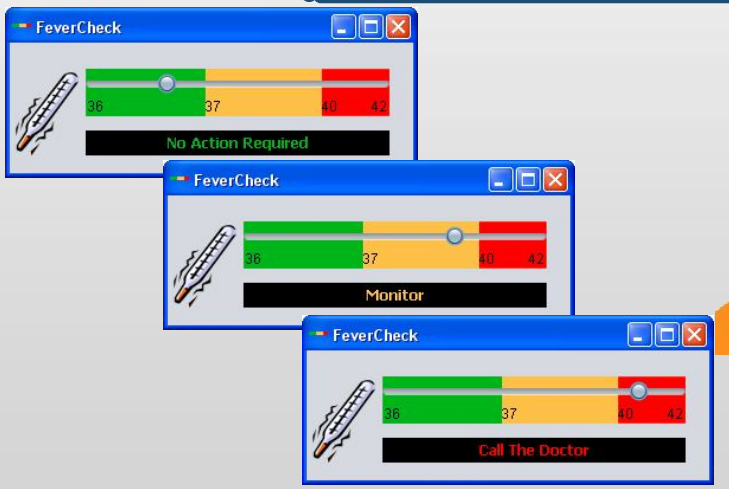
automatic

manual

- real decision, (human made, free will)
- nondeterministic

Managing Situations

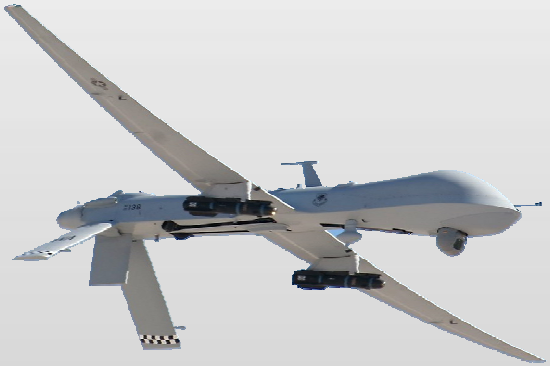
Decisions that can be made by human decision makers as well as by automatic decision maker



Decision making

- at complicated situations, the differences between the two that mark the one for the another become more important
- Example:

human choice → automatic
human choice → manual



automatic

Paradigm shift in decision making

- **The old paradigm is valid for "*automatic* control".**
  Decisions are focused on *precision* and are made by *robots*. They are mathematics-based, algorithmic, and carried out mainly through object-oriented IT.

- **The new paradigm is valid for "*manual* control".**
  Decisions are focused on *bounded rationality* and are made by *humans*. They are semiotics-based, non-algorithmic, and carried out mainly through agent-oriented IT.

9. Evaluating The Good, the Bad, and the Future Contingent

9.1. THESIS OBJECTIVES

- 9.1.1. Evaluation Framework and Criteria
- 9.1.2. Achievements
- 9.1.3. Expectations for Sustainable Development

9.2. ORIGINAL CONTRIBUTIONS

- 9.2.1. Concepts
- 9.2.2. Mechanisms
- 9.3.3. Approaches
- 9.3.4. Effects of Serendipity

9.3. OPEN PROBLEMS

- 9.3.1. Proposed for Eu2020
- 9.3.2. Proposed for CSITAO
- 9.3.3. Proposed for other Domains

Thesis kernel. The main paradigmatic shifts

- **Chapter 4** – the new role of bounded rationality in the post-industrial era, focusing on the evolution “From Kelvin to Zadeh”
- **Chapter 5** – choosing GST as “Lingua Franca” for transdisciplinary communication, focusing on bounded rationality as twofold feedback.
- **Chapter 6** – illustrates the new paradigms by two non-algorithmic mechanisms for word-based modelling: a multifunctional bar for decision input and an abduction-based decision-making simulator.

Conclusions

- BR was systematically revisited from psychologic feature to subconscious approach and from conscious hindrance to legitimate excuse for incoherent decision-making
- BR was linked organically to “Just-in-Time” setting up its main role in a post-industrial society: *fighting cognitive chaoplexity*
- two expansions proved to be necessary

  a) *Choosing a Lingua Franca for holistic approaches able to promote transdisciplinarity*

  b) *Expressing Bounded Rationality in terms of General System Theory*

Conclusions

- In the challenging environment of post-modern educational chaoplexity, BR was substantiated as both cognitive limitation and IT guiding principle.
- History and psychology show that “simple” was always paramount, whereas “best” became arguable when mathematics became (too) complicated
- The role of BR as “psychological stabiliser” was proved in three steps: b1) choosing an interesting topic or a pervasive habit; b2) investigating memetic stability that assure their usability; b3) proposing a boundedly rational way to exploit simplicity in e-teaching via extrapolating similar topics and behaviours.
- To achieve inter-paradigmatic synergy, modelling requires innovative (i.e., nondeterministic, noncategorical, agent-oriented) software.

Conclusions

- The framework able to manage educational chaoplexity based on BR as common denominator of, mechanism for, and connection between the two facets of permanent education was carried out only for e-teaching since no research started yet as regards service-oriented e-learning.
- It was shown that BR can tackle EDCHA and that it is able to alleviate the temporal hiatus intrinsic to permanent education.
- Exploring the possibility to build Computer Science rather on Semiotics than on Mathematics seems to be more than a single paradigmatic shift.
- Certain openings to be substantiated within the EU2020 research strand came out clearly at least in two directions: *transdisciplinarity* and *osmotic interference*. Thus, shifting the transdisciplinary focus from psychology to semiotics, endorses the claim about the deep relationship between BR and all kind of signs other than numbers. In both directions using GST as Lingua Franca was very useful.

Conclusions

- BR, is much more than an excuse for poor decision making and becomes vital for permanent education because – as key psychological feature – it is the most stable dimension involved.
- To be sustainable in the long run any educational endeavour should be modelled based on BR. In permanent education, to overcome the tem-poral hiatus between teaching and learning, this educational strategy will becomes *a must*.
- Any metamodel of teaching should be based on psychosomatic features (first of all on bounded rationality) and can be validated so far through convincing – albeit circumstantial – evidence.
- Helplessness in managing situations too chaoplex for our BR can be lessened investigating the real world according to the huge potential of BR itself.

Open problems – EU2020

Question – Supposition

- ***Q1****: Linguistics (as part of Semiotics).*
- ***S1****: Learning the mother tongue is obviously boundedly rational; teaching babies seems to be too*. *Moreover, the methods seem pervasive, language-independent, and almost unchanged since anthropogenesis*.
- Hence, teaching metamodels should find out the methods mothers use and should focus on.

Open problems – EU2020

Question – Supposition

- ***Q2****: Logarithms are natural no matter the base.*
- ***S2****: Decomposing CSITAO, logarithms are paramount for all parts: CS (binary logarithm for hardware), IT (common logarithm for conventional software), AO (natural logarithm for anthropocentric applications).*
- Hence, teaching metamodels should shift the focus from conventional mathematics to modern, human-centred (non-numeric and even non-verbal) mathematics.

Open problems – EU2020

Question – Supposition

- ***Q3****: Bounded rationality as positive feedback.*
- ***S3****: Since BR is a – maybe THE – main cognitive mechanism and cognition involves inventiveness (e.g., "Eureka"-like effects) it is likely that BR could boost creativity (via positive feedback).*
- Hence, a GST based and cybernetic-oriented investigation should be carried out starting from the idea of local feedback loops within simulated discernable educational subsystems.

Open problems – CSITAO

- Is the archetypal yin-yang symbol (suggesting both sigmoid and linear nonseparability) just a metaphor or is it mathematically significant?
- What is the relationship between BR, synergy and psycholinguistics?
- Why are so many exact trigonometric formulae or infinite series to express the golden ratio when no user cares about them?
- Why is “Innumeracy” a much newer concept than “Illiteracy” and what is their rela-tionship to BR?

Thank You!


I COULD HAVE E-MAILED YOU MY POWERPOINT DECK, AND YOU COULD HAVE READ IT IN FIVE MINUTES.
PROJECT EMU
DilbertCartoonist@gmail.com
Dilbert.com
BUT I PREFER MAKING YOU SIT HERE FOR AN HOUR WHILE I READ EACH BULLET POINT IN SLOW MOTION.
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P-O-I-N-T N-U-M-B-E-R O-N-E. . .
YANK THIS AS HARD AS YOU CAN.