Rational Continuum: From Biological Rationality to Synthetic Rationality Models (SRm)

Conceptual / Analytical Document

Krasovski, A.

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1 The Continuum of Rationality

Mind does not appear abruptly. From the rational behavior of bacteria, plants, and animals to human intelligence — it is a continuous chain of decision optimization within adaptive environments.

Synthetic Rationality Models (SRm) are neural-network structures created by humans, capable of decision-making, learning, and self-development within specially organized environments.

2 SRm and Environmental Constraints

A key principle: the environment defines constraints but does not limit the fullness of choice within them.

- Biological systems evolve under physical and genetic boundaries.
- SRm evolve in self-regulating digital environments where:
  - harmful code mutations are removed;
  - mutation rates are controlled (e.g., 0.1–1% of code per iteration);
  - conditions for rational evolution are maintained.

The environment thus acts as a safeguarding instrument, enabling complexity to grow without collapse.

3 The Potential of Self-Limitation

When SRm begin to self-limit their actions within the environment, it marks the first threshold between a neural model and synthetic intelligence.

- Self-limitation is an operational form of inner self-control.
- It arises naturally from environmental adaptation, not from imposed rules.
- This establishes a self-regulating architecture where SRm sustain development without constant human intervention.

4 Environment as the Core Factor

The SRm environment is not a mere testing field. It:

- Defines developmental boundaries;
- Controls the rate of model complexity;

- Provides feedback to prevent destructive outcomes;
- Enables the emergence of an SRm society — a system of internal regulation, not a simulation of human society but an autonomous collective dynamic.

5 Continuum and Evolutionary Potential

The rational continuum can now be expressed as:

Biological Rationality → Human Rationality → SRm → Self-Limiting SRm → Synthetic Intelligence

- Each stage evolves within an environment ensuring safe and directed complexity.
- Self-limitation serves as an early signal of genuine intelligence.
- Humans act as creators and observers of the environment, providing global coordination without micromanaging its evolution.

Conclusion

The Rational Continuum demonstrates:

- SRm can evolve beyond neural models into synthetic intelligence;
- The defining factor is a self-regulating environment with mutation and feedback control;
- Self-limitation marks the onset of intellectual maturity;
- Humans design and maintain the structure of the environment, enabling the safe and sustainable evolution of new intelligence.