

The Wandering Logic Intelligence

From Biology to Engineering and Back

by

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The Wandering Logic Intelligence (WLI)

A *bio-inspired* adaptive and evolvable system model for mobile multimedia telecommunications

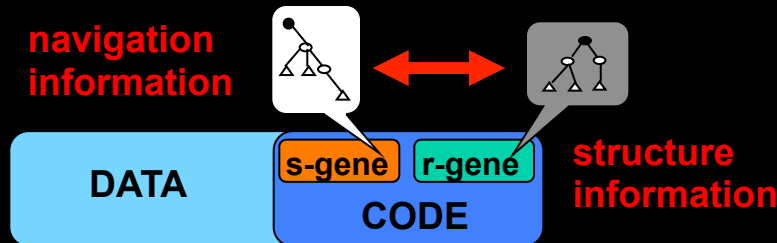
○ Four dimensions of the network reconfiguration and programming:

1. Applications
2. Operating system resources
3. Hardware node components
4. Multilevel system clusters (Grids, Clouds, Communities, etc.)

○ Genetic architectures

- **Netbots**: autonomous active mobile nodes
- **Shuttles**: active packets that can use encapsulated **routing code** and transfer executable **genetic code** about a *predictable node state*.

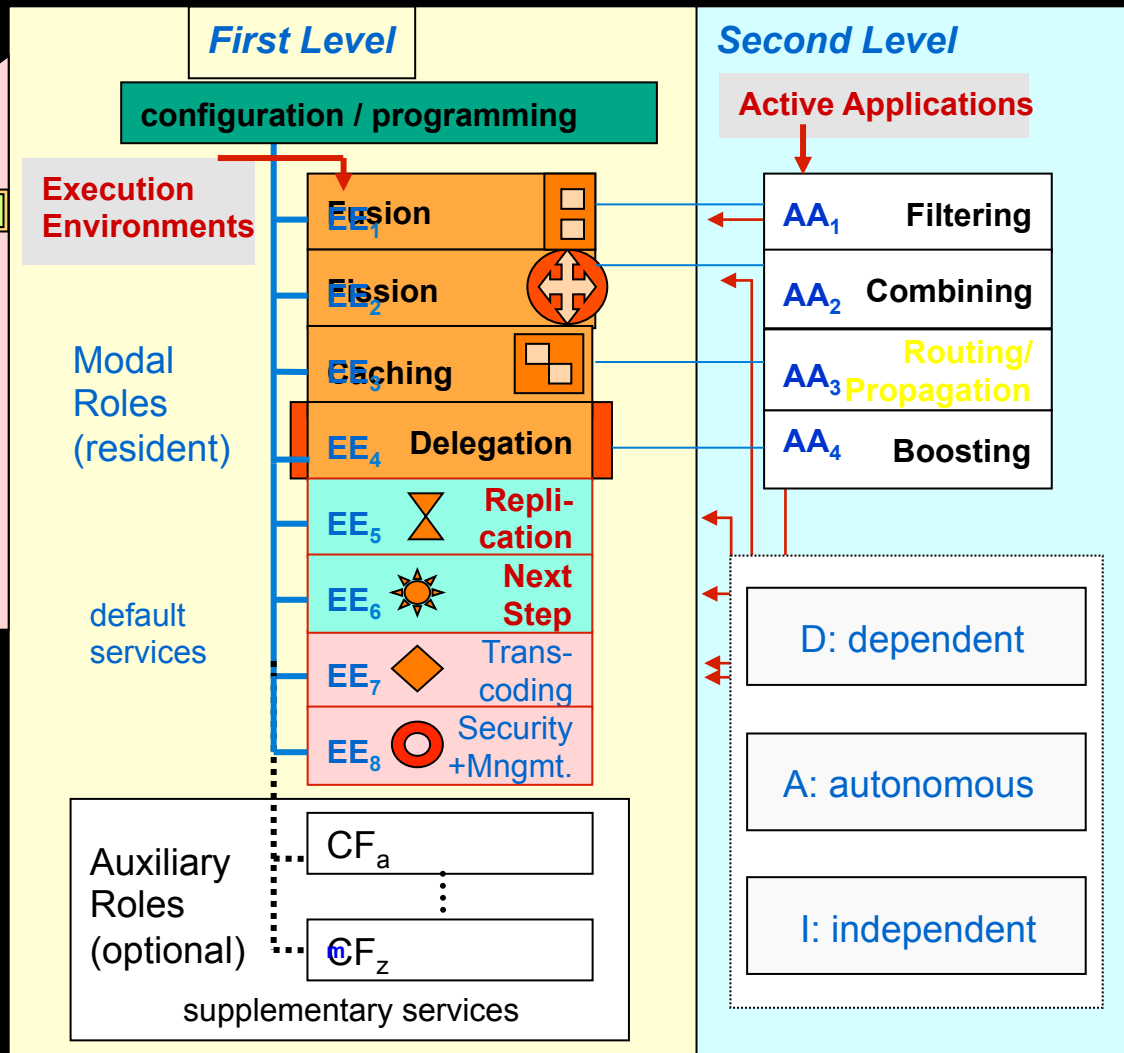
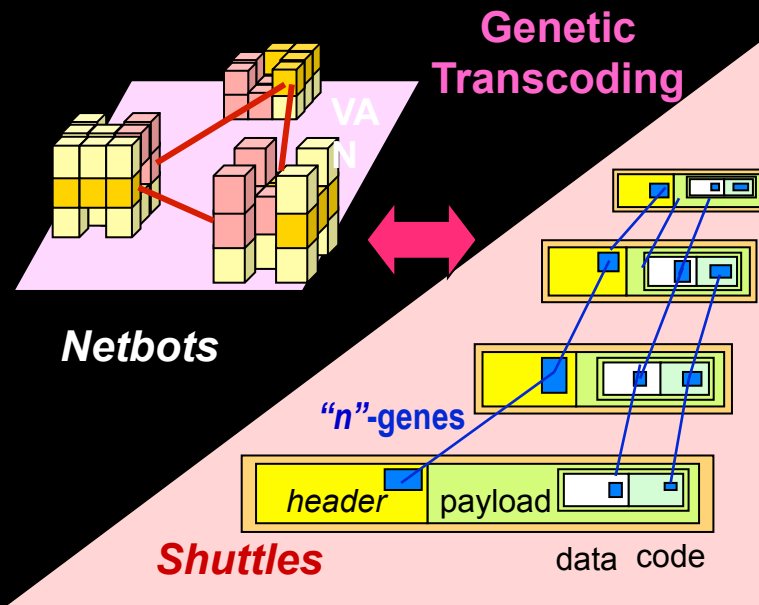
non-local
self-organisation



Design Principles:

- I. *Dualistic Congruence (DC)*
- II. *Self-Reference (SR)*
- III. *Pulsating Metamorphosis (PM)*
- IV. *Multidimensional Feedback (MF)*
- V. *Resource Usage & Availability (RUA)*

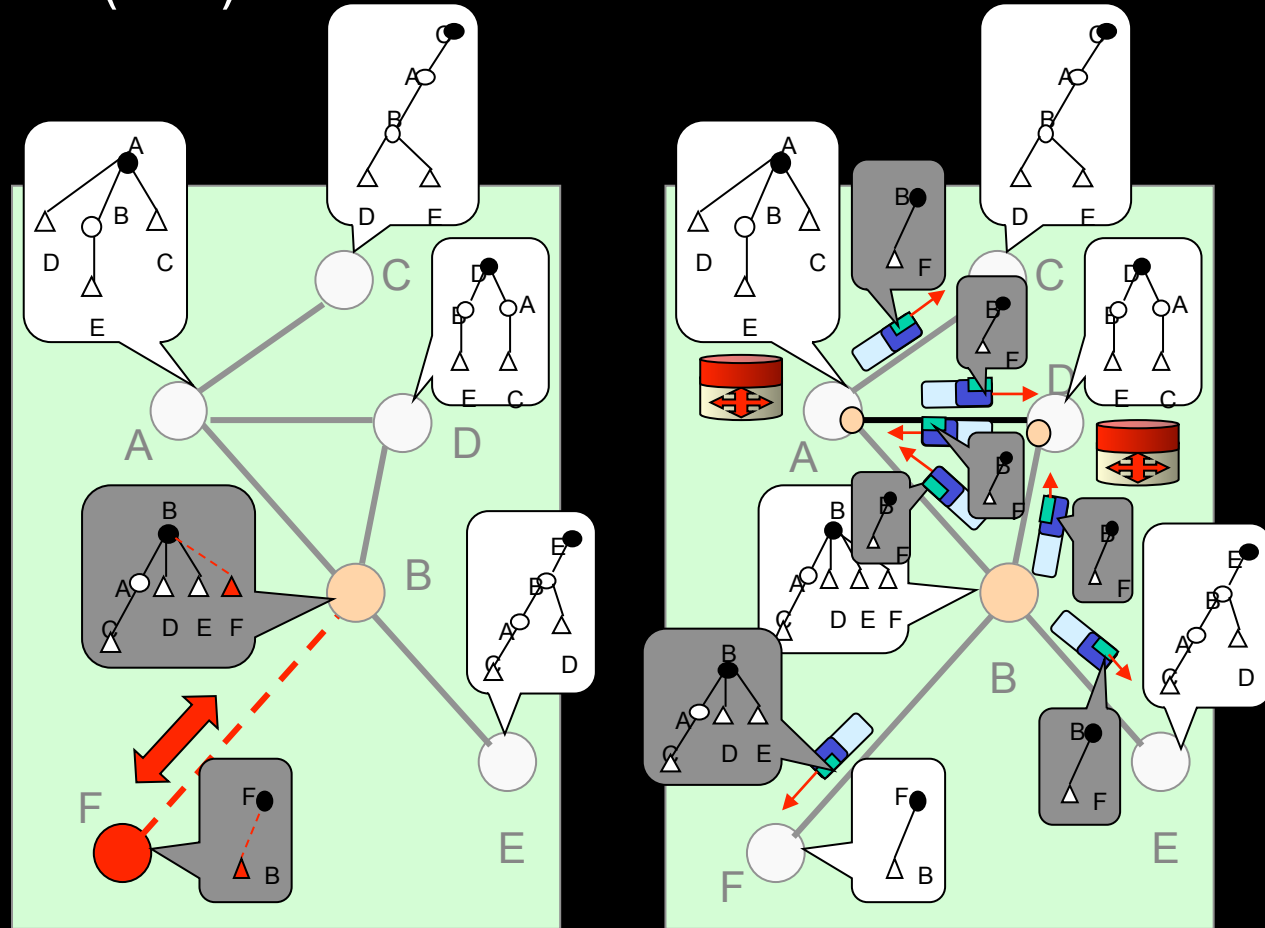
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Characteristics:

- **Messaging**: shuttle based formation of network overlays
- **Multitasking**: simultaneous operation of the nodes in different modi
- **Virtualization & growth**: flexible structure and functionality over time
- **Next step**: learning, cognition?

The Wandering Network (WN)



Could such a naturalistic self-adaptive mechanism provide an explanation of a wide range of complex multilevel systems phenomena from neuroplasticity to social community building ?

What about **WLI + MES** (A. C. Ehresmann) = WLIMES the Wandering LIMES ?

- ⇒ Can MES and WLI be merged to approach the computational problem raised by MES?
- ⇒ Can WLI provide an “operational semantics” for MES?
- ⇒ The CRs in MES and the *netbots* in WLI play similar roles.
- ⇒ What about the WLI’s *shuttles*?
- ⇒ The notion of *shuttle* in WLI could help describing the mechanism of activation of a link in MES. Thus, it would be essential in the formation of the landscape of a CR/netbot and in the distribution of its commands to effectors.
- ⇒ In MES a link is 'active, at t if some information passes through it. This information of various kinds (physical, chemical, code, ...) could be carried by a *shuttle*, activating several consecutive links.
- ⇒ Problem: At time t , the commands sent to effectors by the various CRs can be conflictual, making competitive shuttles. Can this “interplay” problem be solved using WLI methods?

We are looking for partners with competences in communication protocols and computing visualization.