E0L eco-colonies

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Eco-colonies

= model of a community of cooperating processes

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- *word* – any state of the environment,

- *agents (components)* – processes, cooperating grammars, subjects, working parallely,
  - *start symbol* – what the agent can process, the agent looks for this symbol in the environment,
  - *language of the agent* – what the agent can do with its start symbol, the agent finds the start symbol and replaces it by some word of this language.

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- *word* – state of the meadow,

- *agents* – rabbits,
    - *start symbol* – grass-blade,
    - *language of the agent* – piece of soil without grass (the rabbit eats the grass-blade).

Eco-colonies – types

- 0L eco-colonies – the environment is 0L scheme, all words in the environment fall into the language generated by the system,

- E0L eco-colonies – the environment is 0L scheme, there is the second alphabet (terminal alphabet), only the words consisting of the symbols from the terminal alphabet fall into the language generated by the system.

E0L eco-colonies – definition

An E0L eco-colony of degree n, $n \geq 1$, is an $(n+2)$-tuple $\Sigma = (E, A_1, A_2, \ldots, A_n, w_0)$, where

- $E = (V, T, P)$ is E0L scheme, where
  - V is a finite non-empty alphabet,
  - T is a non-empty terminal alphabet, $T \subseteq V$,
  - P is a finite set of E0L rewriting rules over V,
- $A_i = (S_i, F_i)$, $1 \leq i \leq n$, is the i-th agent, where
  - $S_i \in V$ is the start symbol of the agent,
  - $F_i \subseteq (V - \{S_i\})^*$ is a finite set of action rules of the agent (the language of the agent),
- w_0 is the axiom.

E0L eco-colonies – derivation modes

- wp (weakly parallel) – all agents work parallely, every agent whitch can work must work,

- ap (all are working parallely) – all agents work parallely, every agent must work.

E0L eco-colonies – generative power

$$
\begin{aligned}
0EC_{wp} &\subset EEC_{wp} \\
COL_{wp} &\subset EEC_{wp} \\
EEC_{wp} - EG &\neq \emptyset \\
COL_{b} &\subset EEC_{wp} \\
EEC_{wp} - COL_{t} &\neq \emptyset
\end{aligned}
$$