Biological Realms in Computer Science

Didier Verna

didier@lrde.epita.fr
http://www.lrde.epita.fr/~didier

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Transversality: a cure for parceling

- François Jacob (1977) on parceling:

  *The beginning of modern science can be dated from the time when such general questions as “How was the universe created?” [. . . ] were replaced by such limited questions as “How does a stone fall?”*

- Antoine Danchin (2009) on reunification:

  *As Science progresses, there is a steady decrease in the number of postulates on which it has to rely for its development.*

- Uri Alon (2003) on reunification:

  *A fundamental scientific challenge: understanding the laws of nature that unite evolved and engineered systems.*
Biology ↔ Computer Science

Biology
- DNA Translation
- Systems Biology
- Neurobiology
- Genetics

Computer Science
- Turing Machine
- Graph Theory
- Neural Networks
- Genetic Algorithms

DNA Translation ⇐⇒ Computer Science

- Systems Biology
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Biology vs. CS

Discovery vs. Invention

Tinkering vs. Engineering

Case Study: \LaTeX

Perspectives
Some people reverse-engineer Biology
Why not reverse-tinker Computer Science as well?
François Jacob (1977):

[Natural selection] works like a tinkerer – a tinkerer who does not know exactly what he is going to produce.

the engineer works according to a pre-conceived plan [. . .] the objects produced by the engineer, at least by the good engineer, approach the level of perfection made possible by the technology of the time.
A reverse-tinkering example: $\LaTeX$

- Classes, Styles, Conflicts: the biological Realm of $\LaTeX$. In *TUGboat 31:2 2010, Proceedings of TUG 2010, the $\TeX$ Users Group conference.*
What CS system would you like to reverse-tinker today?