



Realms

Didier Verna

Transversality

Biology vs.
CS

Discovery vs.
Invention

Tinkering vs.
Engineering

Case Study:
L^AT_EX

Perspectives

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

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- 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 \iff Computer Science

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Biology

DNA Translation

Systems Biology

Neurobiology

Genetics

Computer Science

Turing Machine

Graph Theory

Neural Networks

Genetic Algorithms





Discovery vs. Invention

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Biology vs. CS

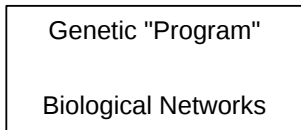
Discovery vs. Invention

Tinkering vs. Engineering

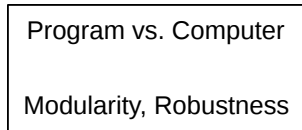
Case Study: L^AT_EX

Perspectives

Biology



Computer Science



- Some people reverse-engineer Biology
- Why not reverse-tinker Computer Science as well ?



The tinkerer vs. the engineer

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- 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

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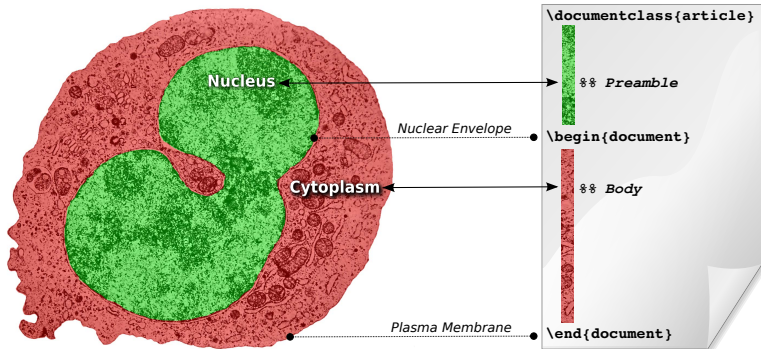
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Perspectives



- Classes, Styles, Conflicts: the biological Realm of \LaTeX . In *TUGboat 31:2 2010, Proceedings of TUG 2010, the \TeX Users Group conference.*



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What CS system would you like to reverse-tinker today ?