

M. Pop

Hard problems

Map labelling

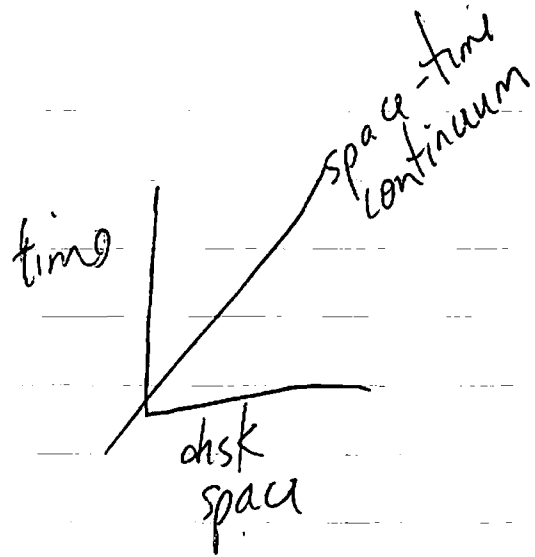
Graph coloring

Travelling salesman

Bin packing

Shortest common superstring

Integer optimization



Algorithm = recipe for solving problem

efficiency = speed, memory, disk space

easy \rightarrow NP complete \rightarrow hard

$$\begin{array}{cc} 2 & 3 \\ \log 10^2 & 10^3 \end{array}$$

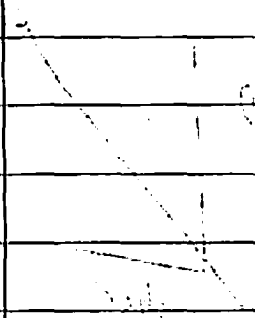
$$1000^{100} < 10^{1000}$$

$$\begin{array}{cc} n^{100} & 10^n \\ 100(\log n) \text{ vs } n \log 10 & \end{array}$$

$$x^n + y^n = z^n$$

$$10^{100}$$

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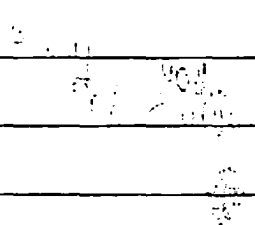
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Polynaviruses

Insect viruses

Segmented DNA genomes - covalently linked dsDNA circles
mutualistic associations w/ Parasitic Wasps

Ichnoviruses - infect Ichneumonid wasps

Bracoviruses - infect Braconid wasps

- symbionts w/ wasps -

- wasp he works on attacks tobacco hornworm moths

- virus + host phylogeny NOT congruent



- Cys motifs
- Rep genes
- Vinnoxins - have insect homologs

n^{100} vs 10^n

n^x vs 10^n

$x \cdot (\log n)$ vs $n \log 10$

$x(\log n)$ vs n

if $x=10$

