

Data-driven Comparison of Plague Models

Senior Project

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Outline

- 1 Background
- 2 Preliminary Models
- 3 Method: MCMC
- 4 Comparison
- 5 Results
- 6 Future Work

Patterns

Pattern Formation

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- Patterns in Nature:

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- Patterns in Nature:



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- Patterns in Nature:



Simpler Model

Morphogenesis

Simpler Model

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- Morphogens related to cell growth

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- Chemical that react

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Pneumonic Model

General Model

$$\frac{\partial A}{\partial t} = F(A, B) + D_A \nabla A$$

$$\frac{\partial B}{\partial t} = G(A, B) + D_B \nabla B$$

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$$\frac{\partial A}{\partial t} = F(A, B) + D_A \nabla^2 A$$

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- A, B Concentration of Chemical Morphogens

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Keeling-Gilligan Rat Model

Turing-specific models

- Reaction Diffusion is very general

Keeling-Gilligan Rat Model

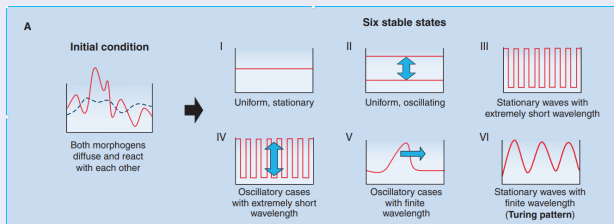
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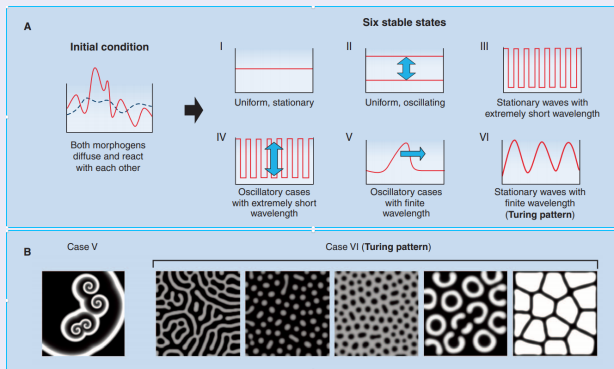
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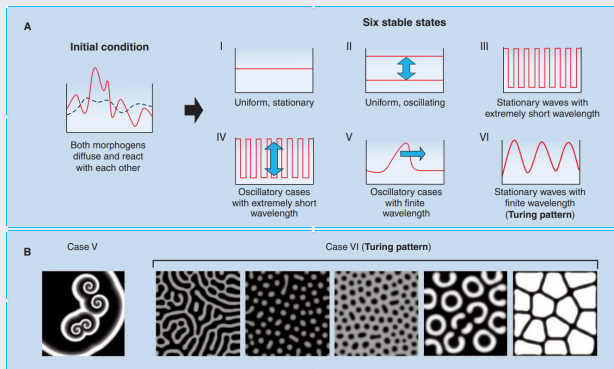
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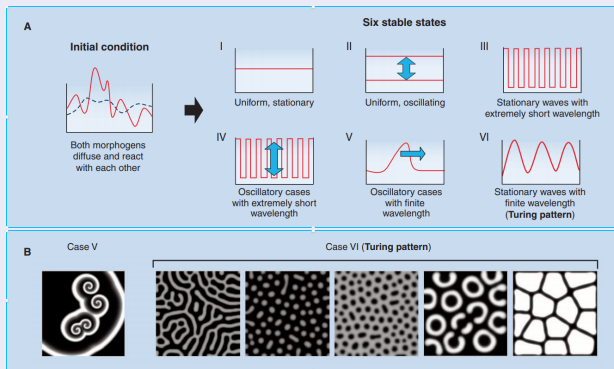
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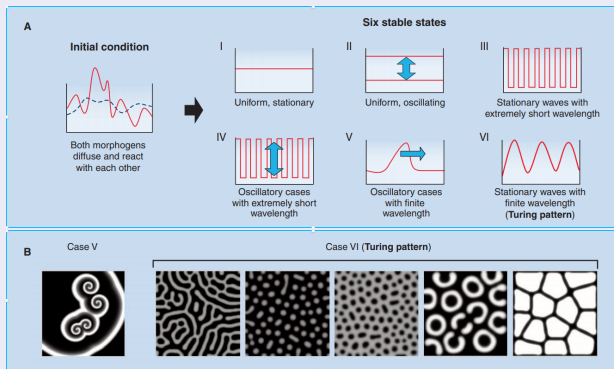
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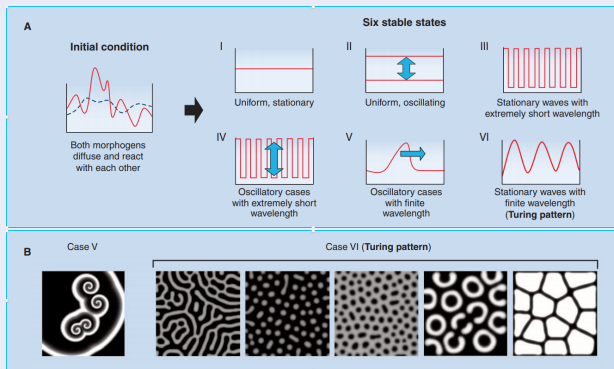
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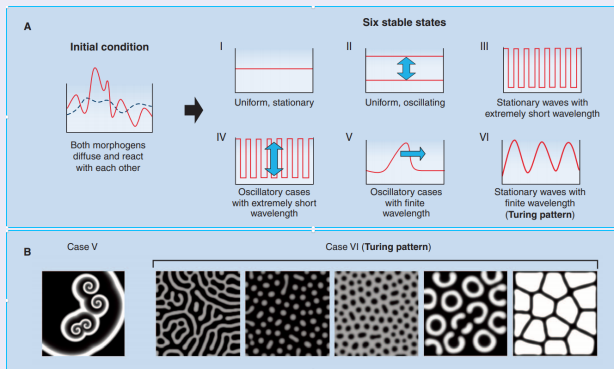
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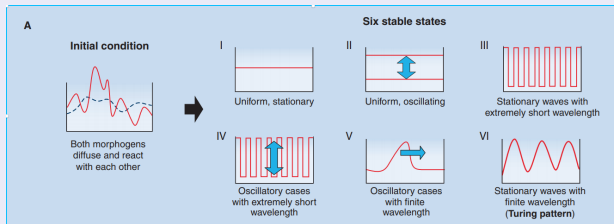
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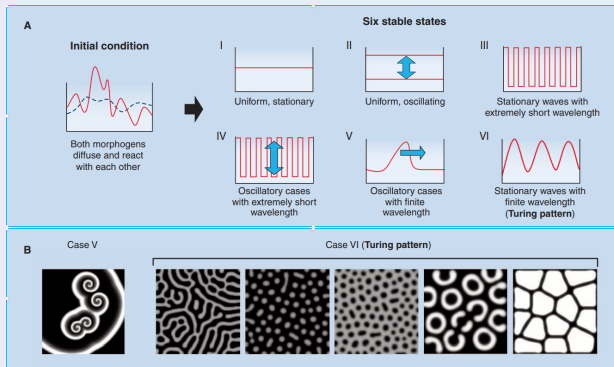
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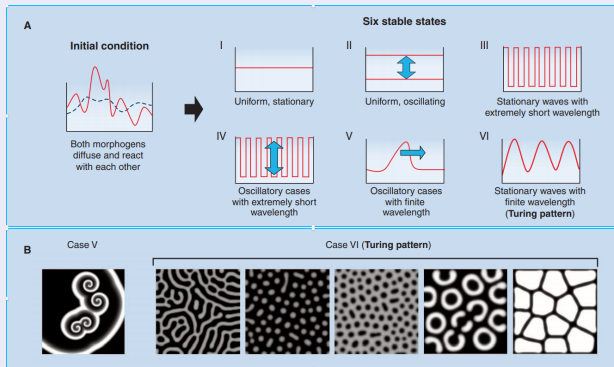
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Human-Ectoparasite Model

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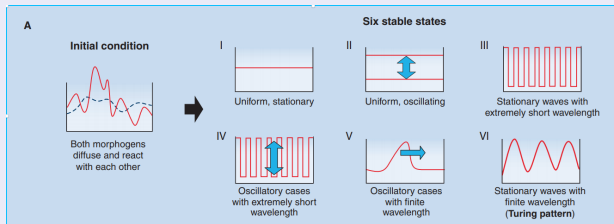
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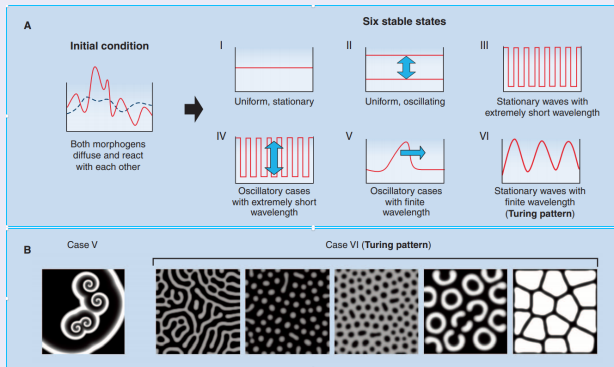
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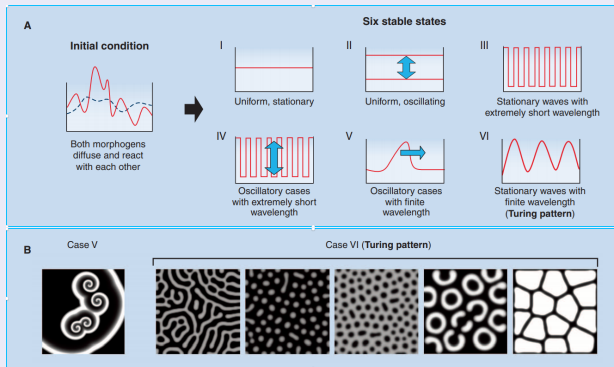
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Future Testbed

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