Learning Optimal Snake Robot Movement Via Evolutionary Algorithms

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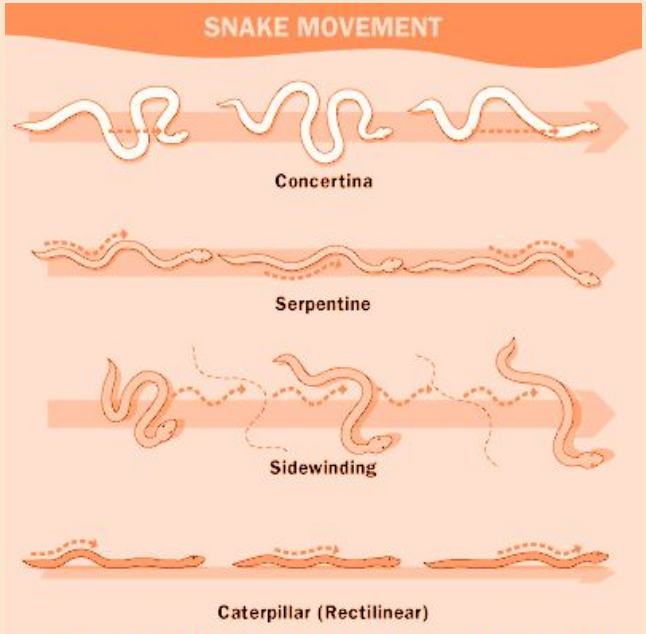
Project Page , References

bit.ly/3elgXBc

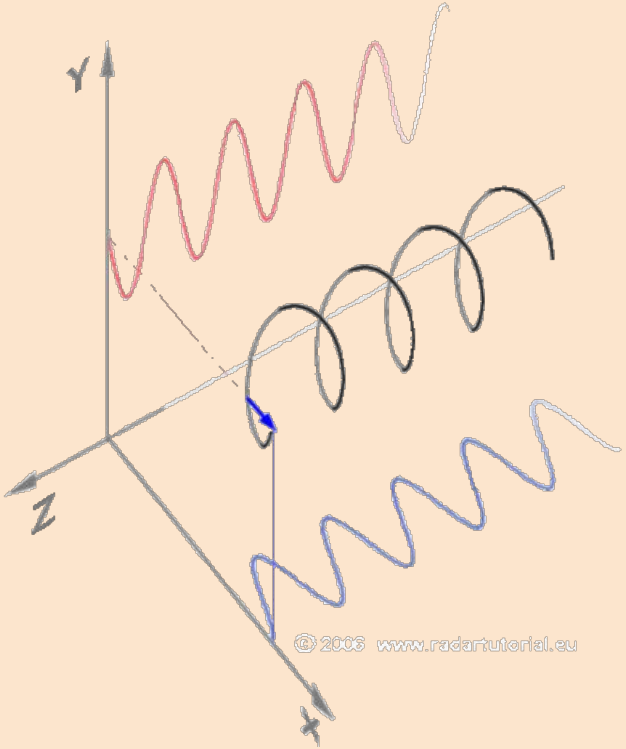
What’s the idea behind the project ?



- Simulating snake movement using evolutionary algorithm
- Comparing our project result

  VS real world

What's the physics behind the snake ?



Snake Vertical joints = AV * sin (S* [t + PV])

Snake Horizontal joints = AH * cos (S* [t + PH])

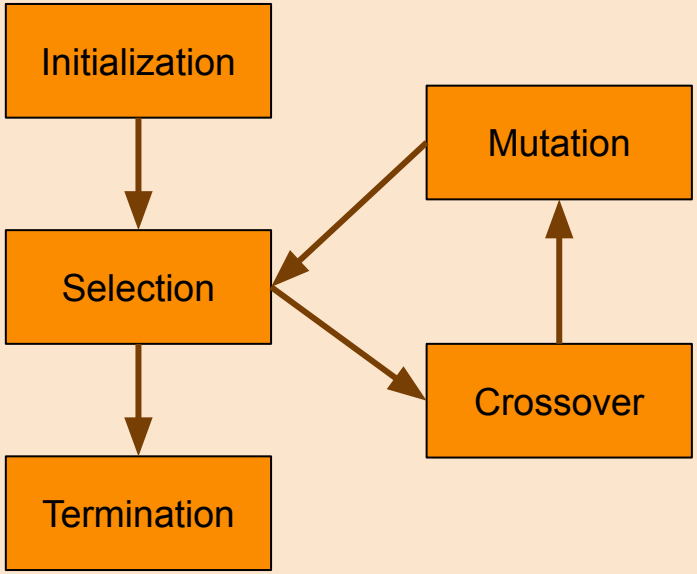
Amplitudes = AV , AH

Phase shift = PV , PH

Speed =S

Snake Head (camera)=PC

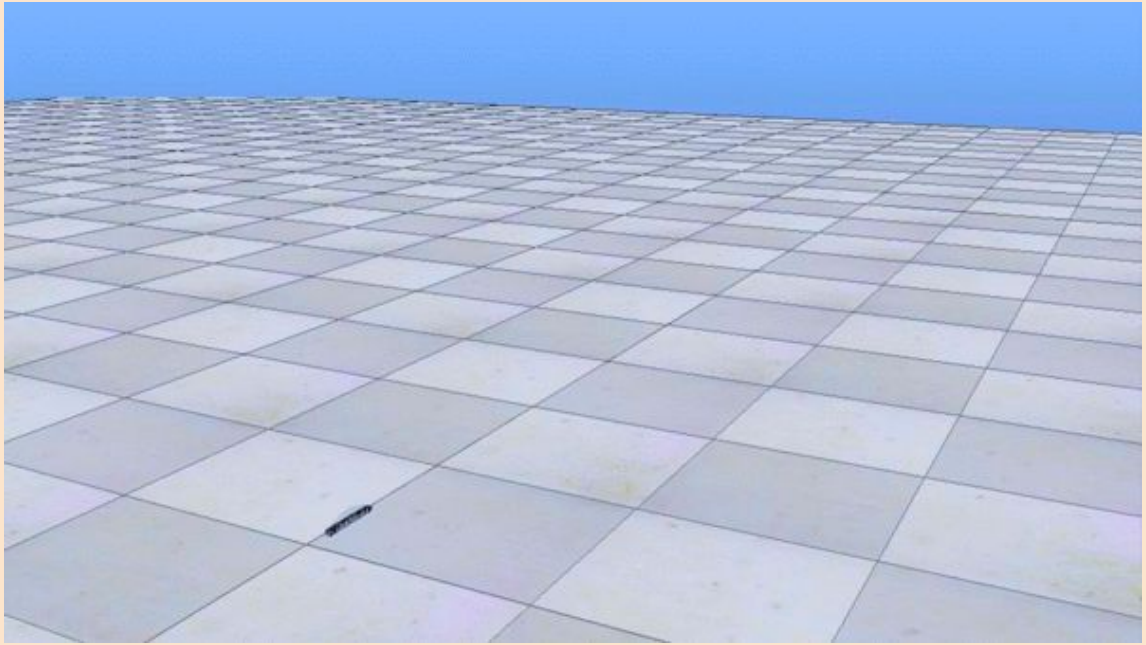
Why did we use genetic algorithm ?



Lets try evolutionary algorithm , what could go wrong

Generation samples

Overview of Generations



1st Generation

10th Generation

50th Generation

100th Generation


Sidewinding

Summary , Q & A

- Sine Function Movements
- Genetic Algorithms
- Future Work

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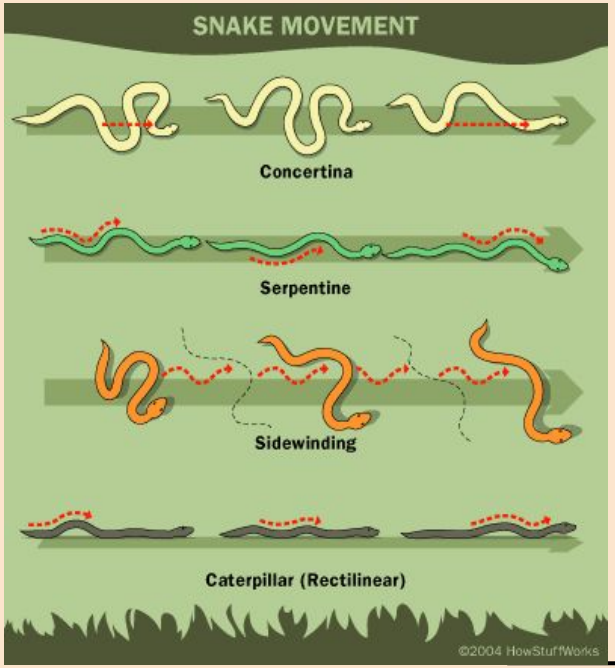
Appendix A

Appendix B


SNAKE MOVEMENT
Concertina
Serpentine
Sidewinding
Caterpillar (Rectilinear)
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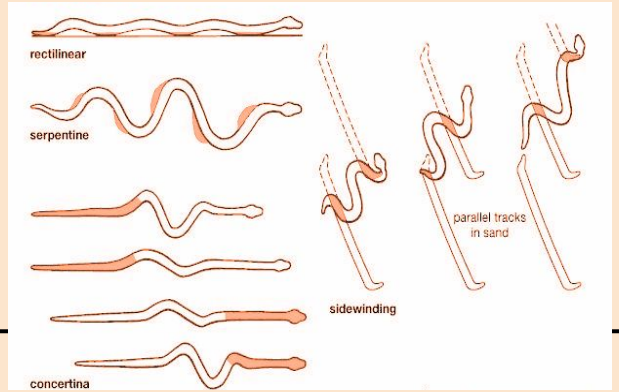
rectilinear
serpentine
concertina
sidewinding
parallel tracks in sand

Appendix C : Issues we've faced !

Note: Coppelia/snake is kind of inconsistent, often the same snake won't perform the same from one gen to another