NSTC seminar:
Assumptions of classical computing
seminar structure

• seminar part a
  ▪ each group discusses their scenario
    ❖ discuss the problem and what you need to go away and find out
    ❖ do not try to solve the problem here

• offline
  ▪ research ideas
  ▪ suggest solutions
  ▪ prepare 8-10 min group presentation

• seminar part b
  ▪ each group
    ❖ 8-10 min presentation of results/findings
    ❖ q&a
  ▪ reflection
what is *Standard* Computation?

- **Turing paradigm**
  - finite discrete classical state machine, Halting, Universal
  - closed system, predefined state space

- **Von Neumann paradigm**
  - sequential fetch-execute-store

- **algorithmic paradigm**
  - deterministic function from initial input to final output
  - black-box isolated from the world

- **refinement paradigm**
  - a known specification is refined to provably correct code

- **pure logic paradigm**
  - substrate (hardware/physics) is irrelevant
The scenarios

- Standard computation has certain underlying assumptions.
- Bio-inspired population-based algorithms are a form of non-standard computation.
  - Yet they are implemented on classical computers.
- Discuss, in the context of:
  1. Turing paradigm
  2. Von Neumann paradigm
  3. Refinement paradigm
  4. Algorithmic paradigm