

CSC2720H: Systems Thinking for Global Problems


Prof Steve Easterbrook
Dept of Computer Science

<http://www.cs.toronto.edu/~sme/SystemsThinking>




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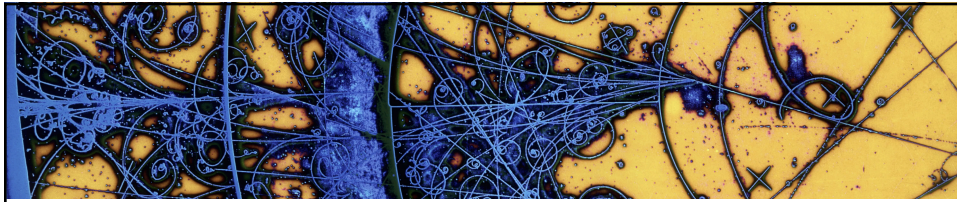
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Week 6

- Review course so far
- Coursework:
 - ↳ Presentations
 - ↳ Term Papers & abstracts
- Game: Warped Juggle
 - ↳ Practice Observing Systems
 - ↳ Practice Drawing Feedback Loops
- System Archetypes

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Systems Activity:
Group Juggle



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Rules

Players:


Goal: As a group, keep as many balls in the air as possible

Rules:

1. You can only throw to your designated catcher (throwing order is fixed)
2. I can throw to anyone who doesn't have a ball
3. As I see you successfully keeping more balls in the air, I will throw more and more balls in

Observers:

1. Identify which key variables / behaviours to observe
2. Decide among yourself who will keep track of what

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Levels of Perspective

→ Events:

- ↳ What happened?
- ↳ Who does what to whom?

→ Patterns:

- ↳ What is happening over time?
- ↳ Re-occurring patterns of behaviour

→ Structure:

- ↳ Why is this happening?
- ↳ How are the parts of the system organized?

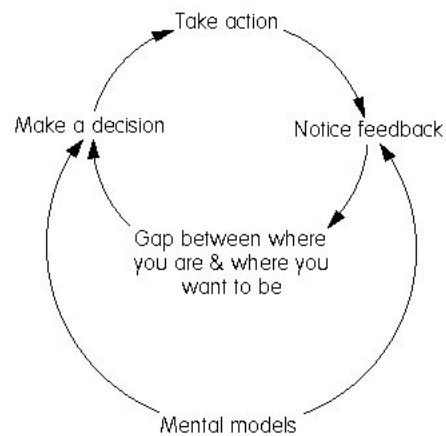
→ Mental Models:

- ↳ How do our mental models create or sustain the structure of the system?
- ↳ Assumptions or worldviews of participants

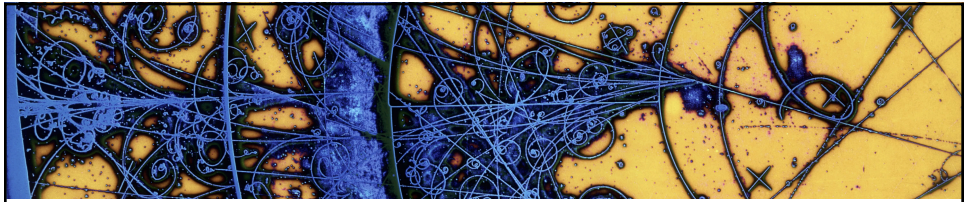
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Double Loop Learning



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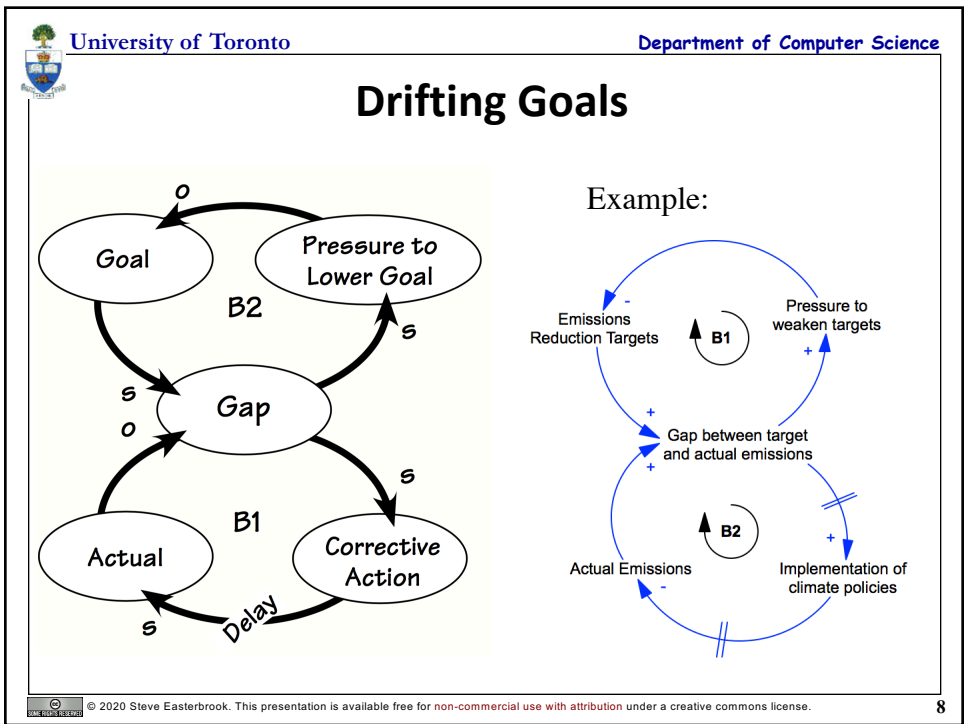
Systems Practice

Systems Archetypes

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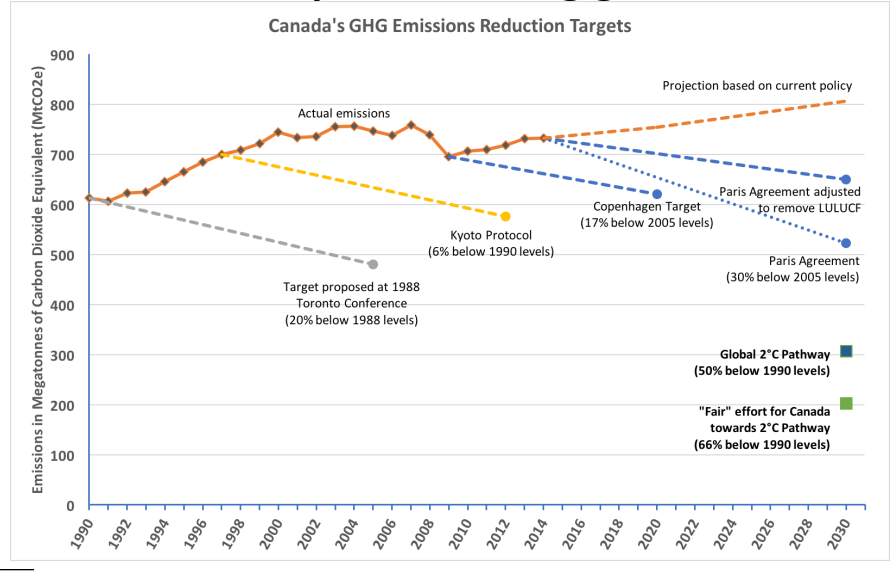


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Example of drifting goals

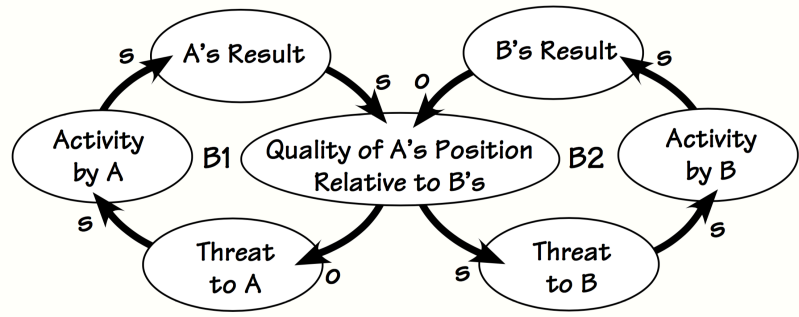


See: <http://www.easterbrook.ca/steve/2016/10/missing-the-target-canadas-deplorable-record-on-carbon-emissions/>

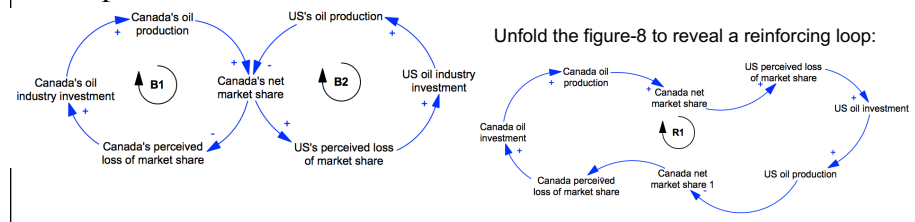
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Escalation



Example:



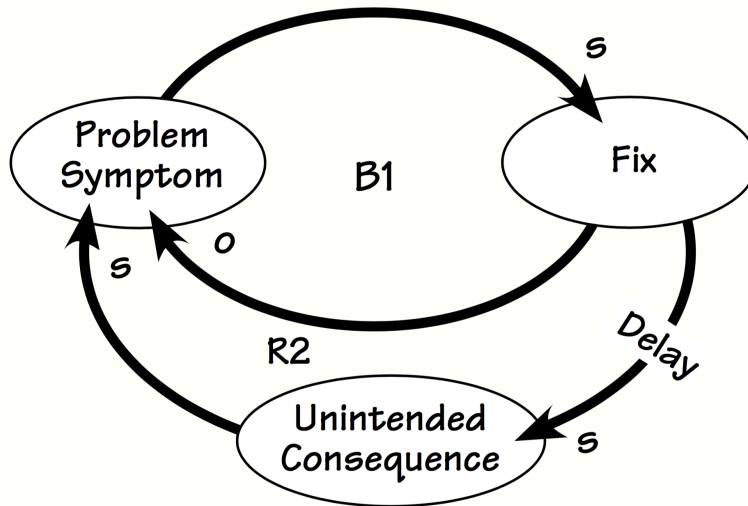
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Fixes that Fail

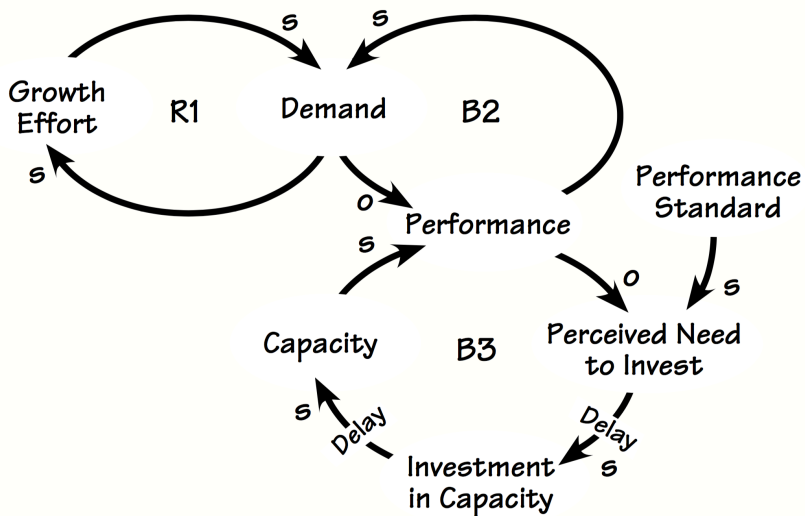


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Growth and Underinvestment

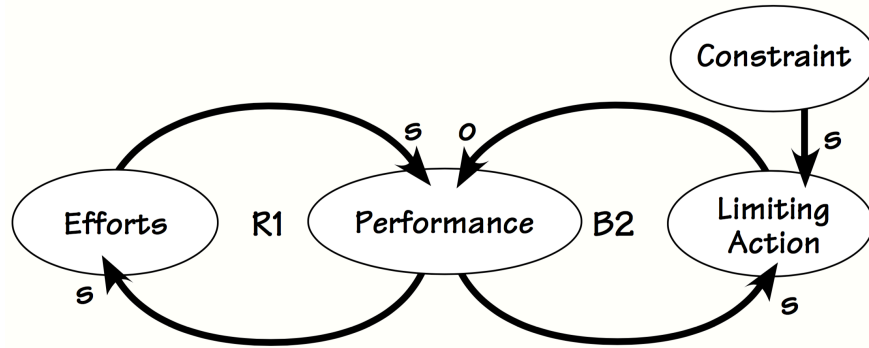


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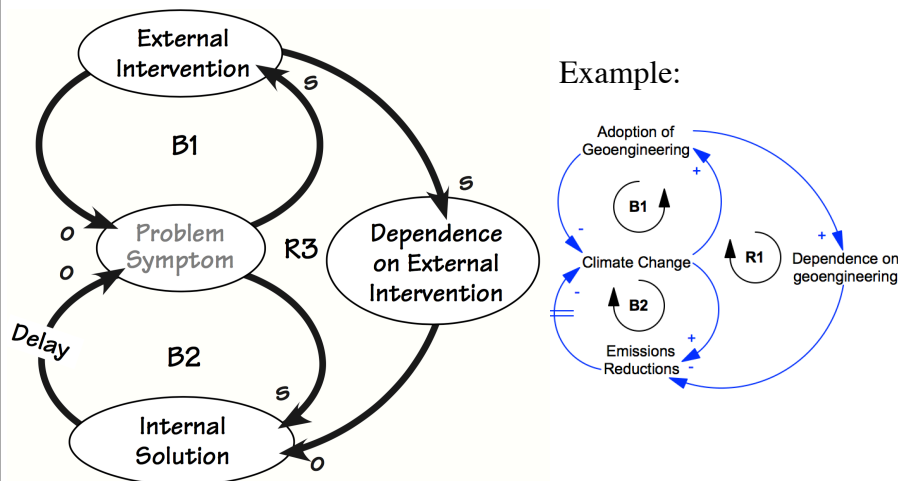
Limits to Success



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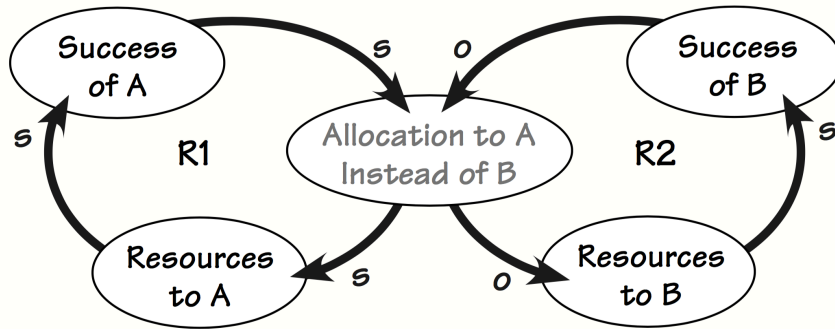
Shifting the Burden (addiction)



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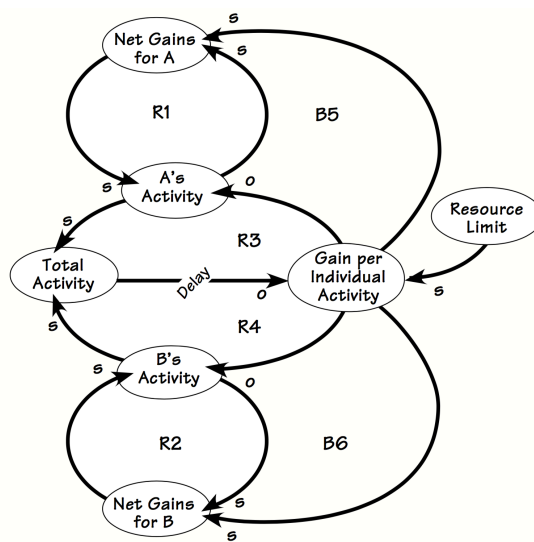
Success to the Successful



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Tragedy of the Commons



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