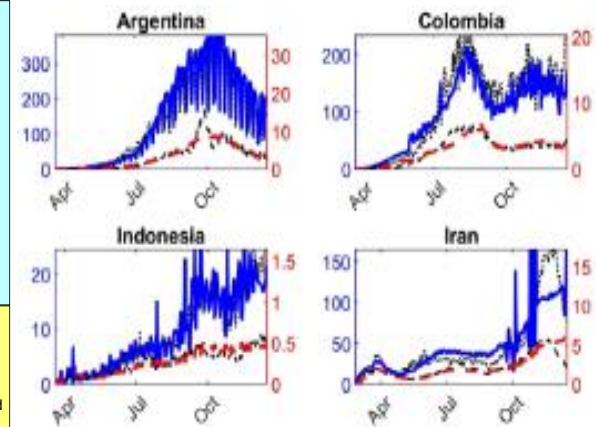
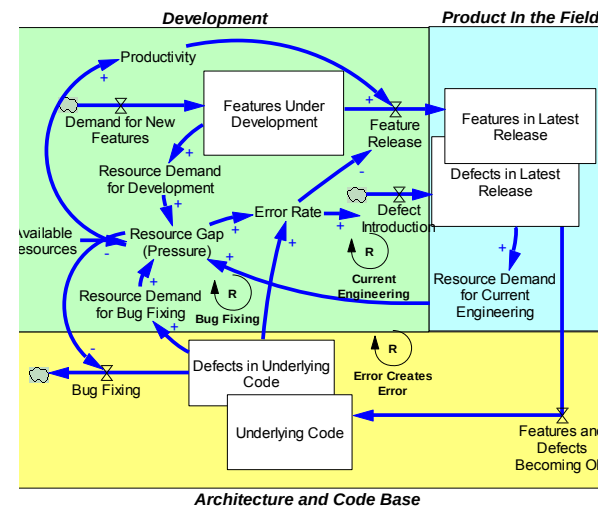
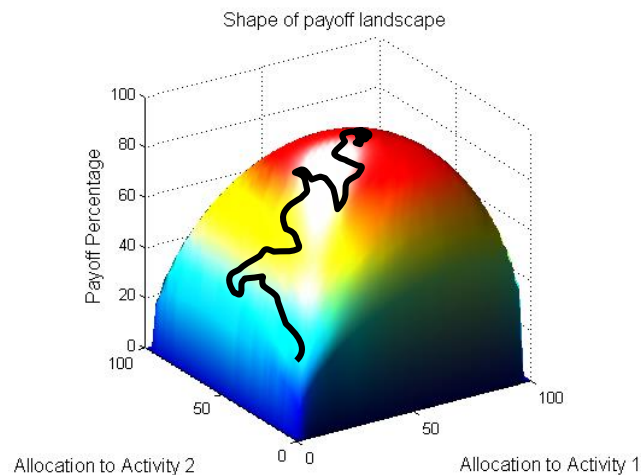
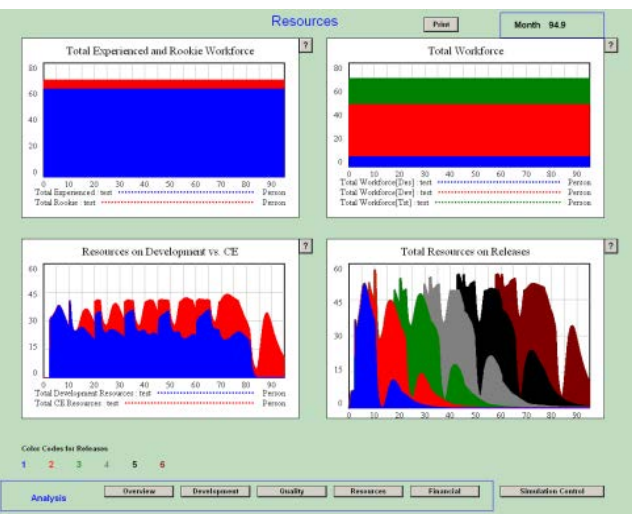


System Dynamics Research Seminar

Week 2: SEIRb with vaccination

15.879, Spring 2025



Modeling challenge 2: extending SIR model

- Including behavioral responses to risk
 - How to model risk and its impact on behavior?
- Waning of immunity
- Equilibrium
- Vaccination
 - Capturing vaccination rate (with partial interest, and capacity constraints)
 - Modeling infections (for both vaccinated and unvaccinated)

Preparing for Next week: Energy Coflows

- Exercise 3 focuses on building coflows tracking energy efficiency of buildings as they change due to 1) Vintage effects 2) Retrofits 3) New efficiency technologies.
- Given this:
 - What is a good audience, and purpose for your model?
 - How can you ensure equilibrium conditions
 - What stocks would you need to include?
 - Can you use subscripts to do it more efficiently?
 - What are good tests of performance and robustness for the resulting model?
 - What are key inputs to change and outputs to track for those tests?

What are good tests of performance and robustness for the resulting model?

- Inputs and outputs?
 - I: Building of new buildings
 - I: Investment in efficiency technology
 - I: Retrofit investments
 - O: Total energy consumption; per sqf energy consumption
 - O: Efficiency of retrofit investments
- Extreme conditions:
 - Energy efficiency remain above min for vintage
 - If you invest in retrofits, energy consumption per sqf should not increase

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15.879 Building Serious System Dynamics Models from Scratch
Spring 2025

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