

# Random Dungeon Generation

CMPSMP2Y – Proposal

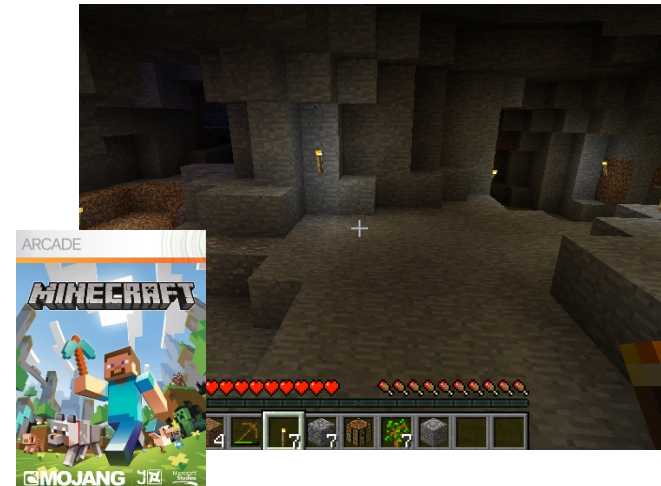
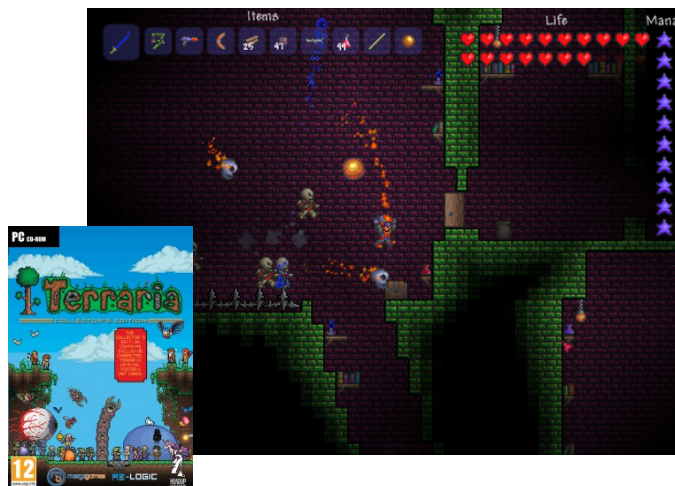
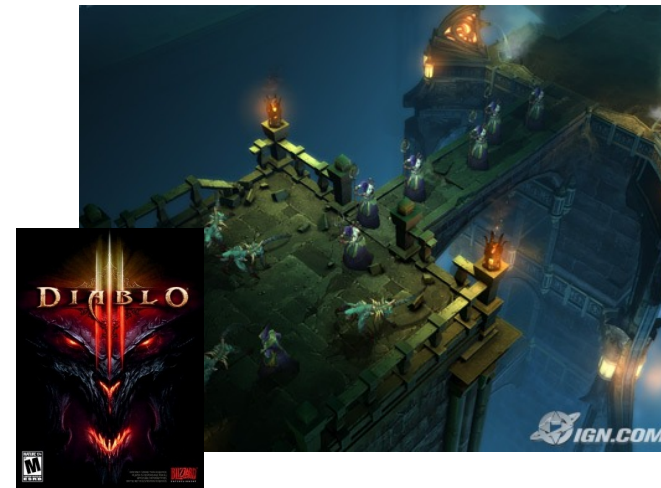
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[Supervisor: Prof. A. Day]

# Introduction

- What is **Procedural Content Generation** (PCG)?
  - It involves **random** generation of content.
- Content includes
  - Game level (static terrain)
  - Enemy distribution
  - Interact-able features (e.g. doors, treasure chest)

# Some examples

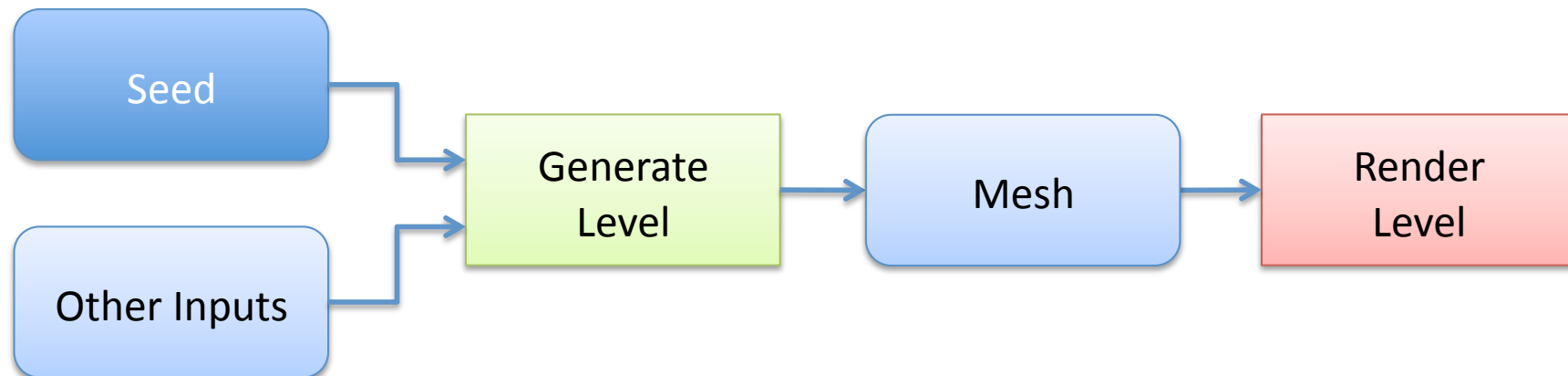


# Statement of problem

- Most level generators are 2-dimensional
- Lack of generalised algorithm
  - Commercial game developers don't openly distribute their algorithms.
  - Even if they did, those algorithms probably wouldn't be reusable.

# Aims and Objectives

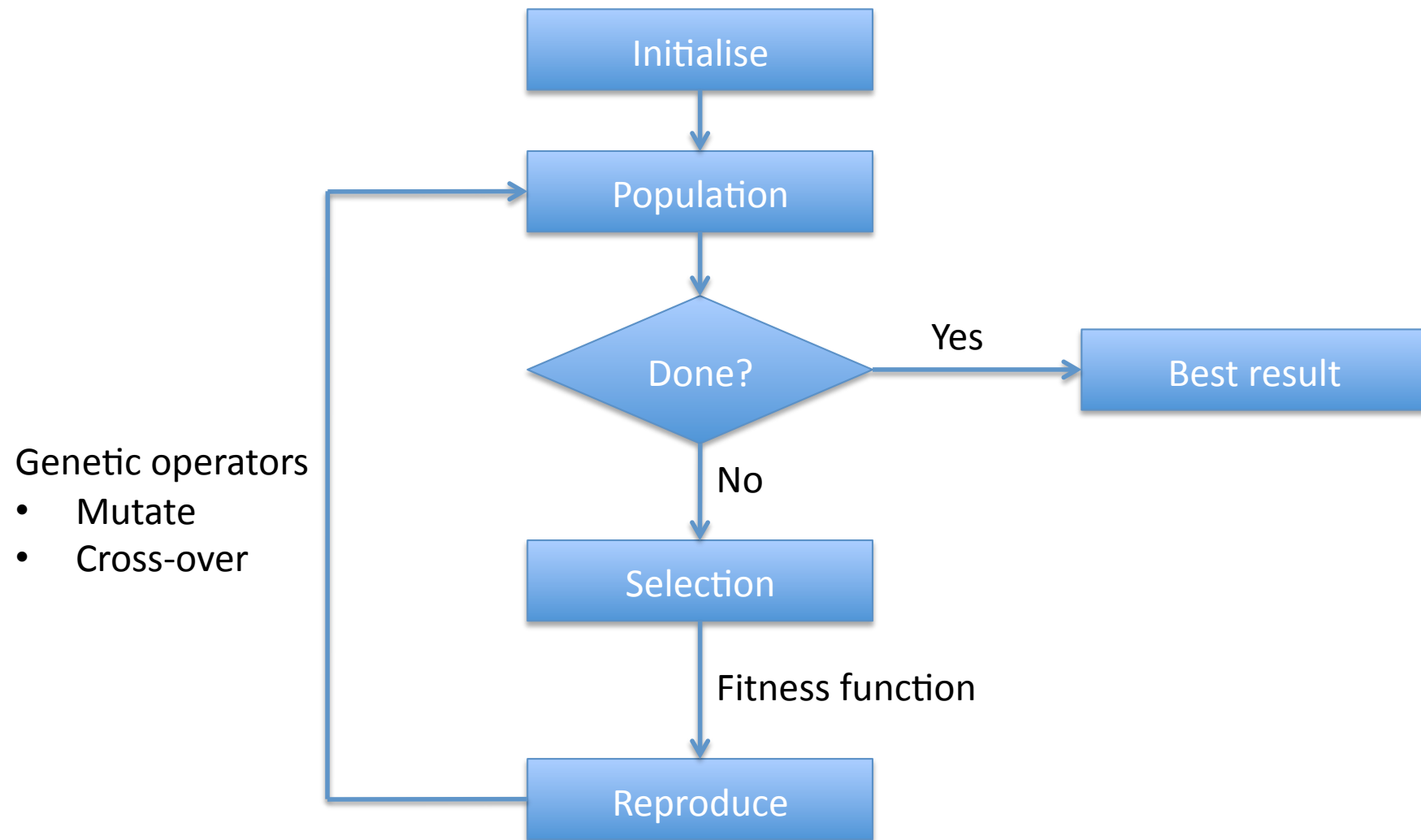
- Develop a **3D-based** level generator
  - Take **game elements** into consideration
  - Maintain **independency** and **generalisation**.
- Render a convincing man-made structure



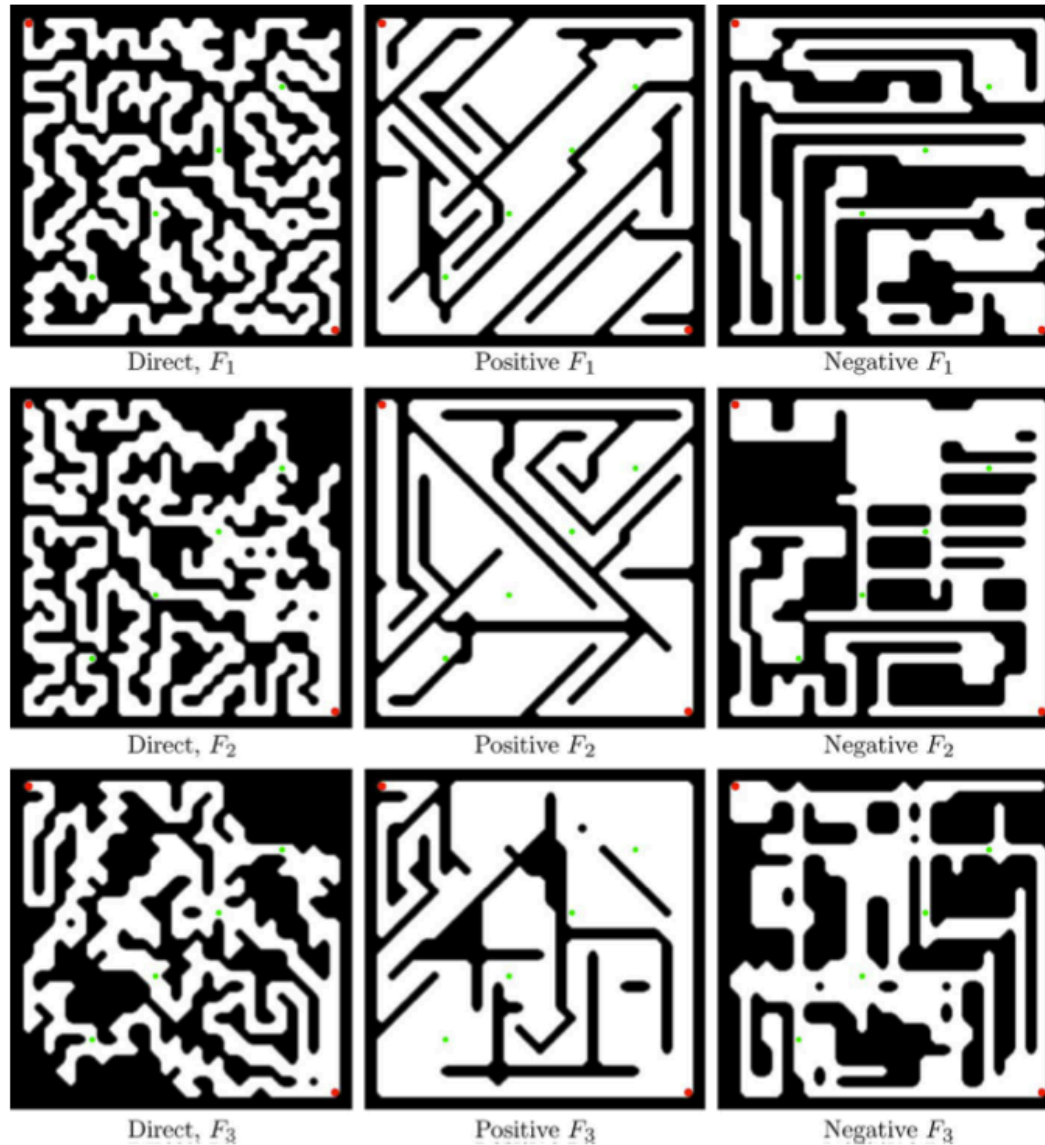
# Methods, techniques and tools

- Genetic algorithms
- Occupancy-regulation
- Procedural Modelling

# Genetic algorithms



# Genetic algorithms



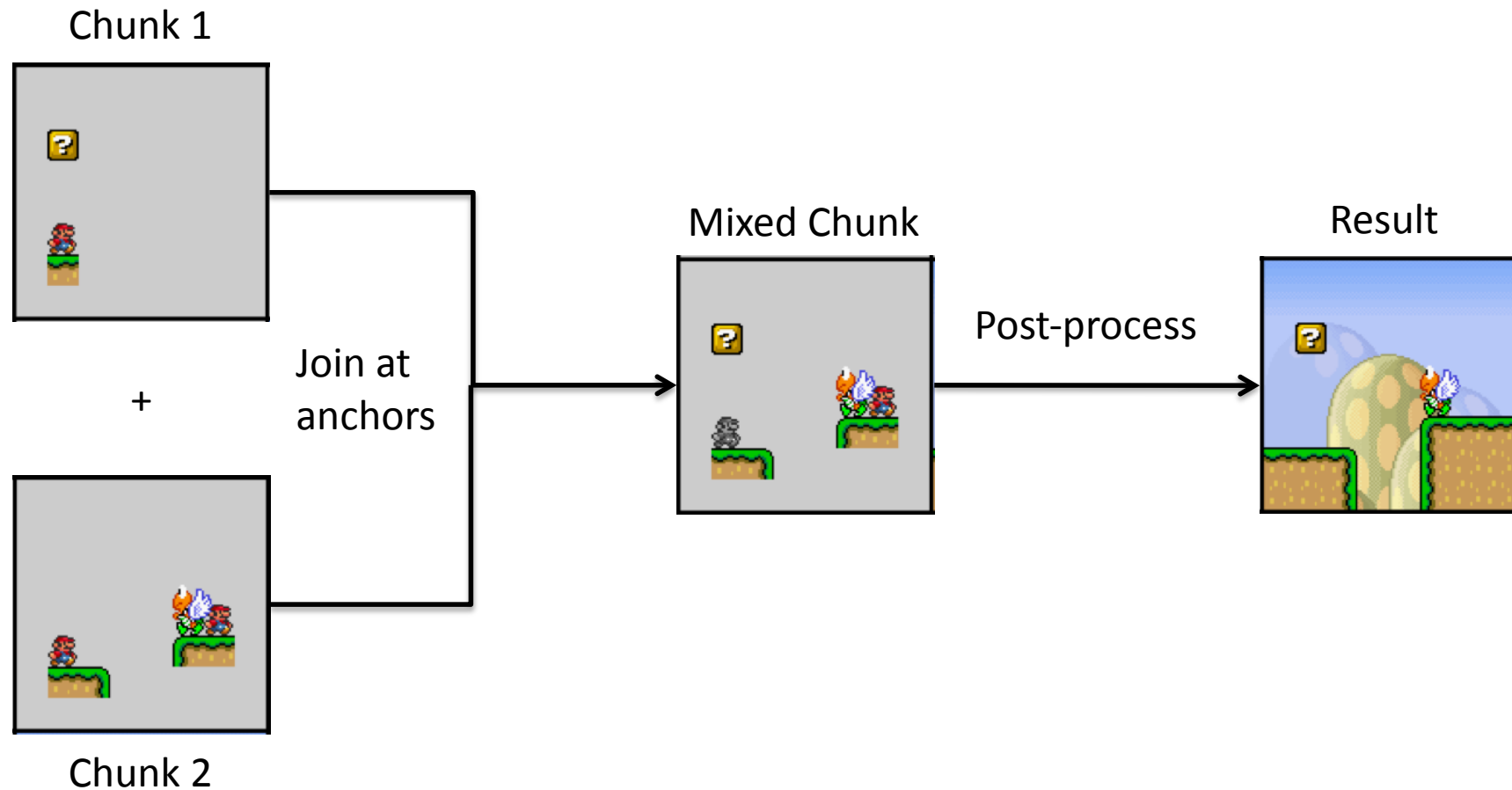


# Genetic algorithms

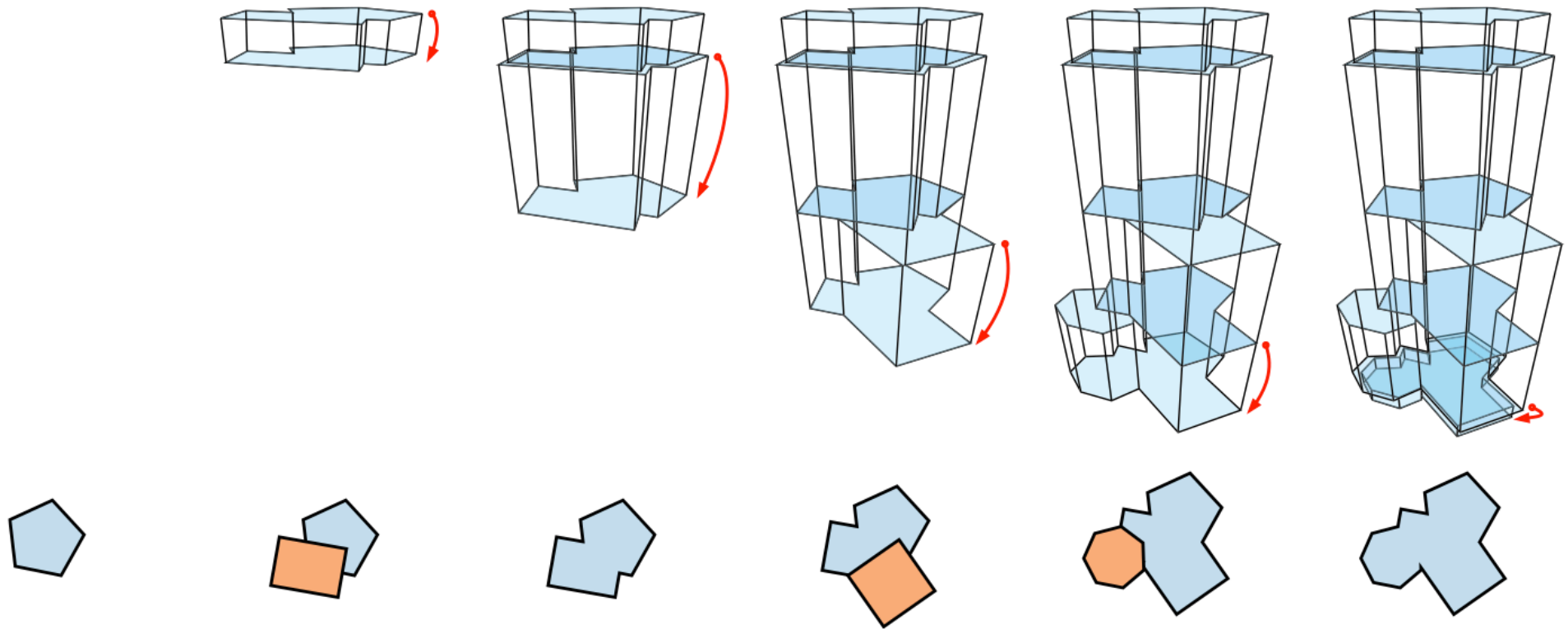
- Advantages
  - Provides decent result
  - Good abstraction
- Disadvantages
  - Notoriously slow
  - Initial population required

# Methods, techniques and tools

- Occupancy-regulated algorithms

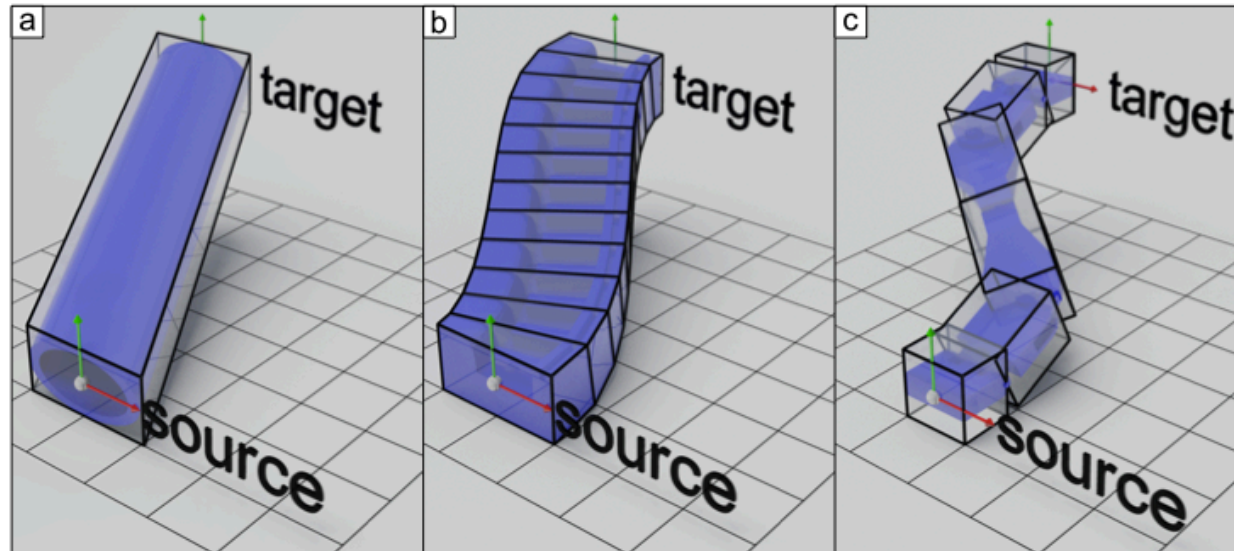


# Procedural Modelling

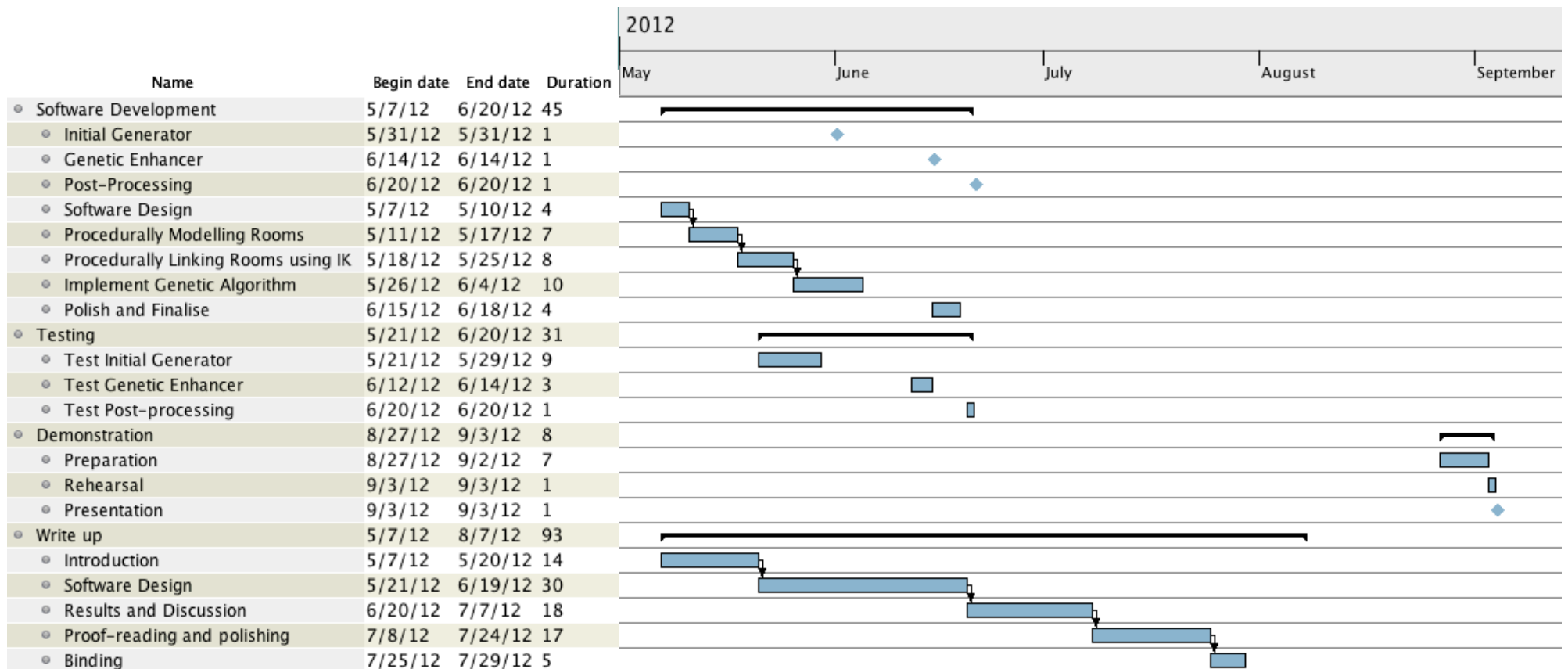


# Interconnecting Structures

- a) Linear interpolation
- b) Deformable beams
- c) Using Inverse Kinematics (IK)



# Project Plan



# Risk Analysis

Risk Type	Probability	Severity	Prevention
Hard-Disk Failure	Low	Very High	<ul style="list-style-type: none"><li>• Keeping backup on a 2<sup>nd</sup> hard-disk.</li><li>• <b>[PREFERABLE]</b> Keeping the project under a version-control server (SVN).</li></ul>
Software development delay	High	Medium	<ul style="list-style-type: none"><li>• <b>[PREFERABLE]</b> Reserving spare days on the project plan to catch up.</li><li>• Cutting up some functionalities</li></ul>
Overly complex task	Medium	High	<ul style="list-style-type: none"><li>• Add constraints to the problem.</li></ul>
Minor Illness	Medium	Low	<ul style="list-style-type: none"><li>• Reserve spare days to compensate.</li></ul>

Any questions?