TJ Hallway Traffic Simulation

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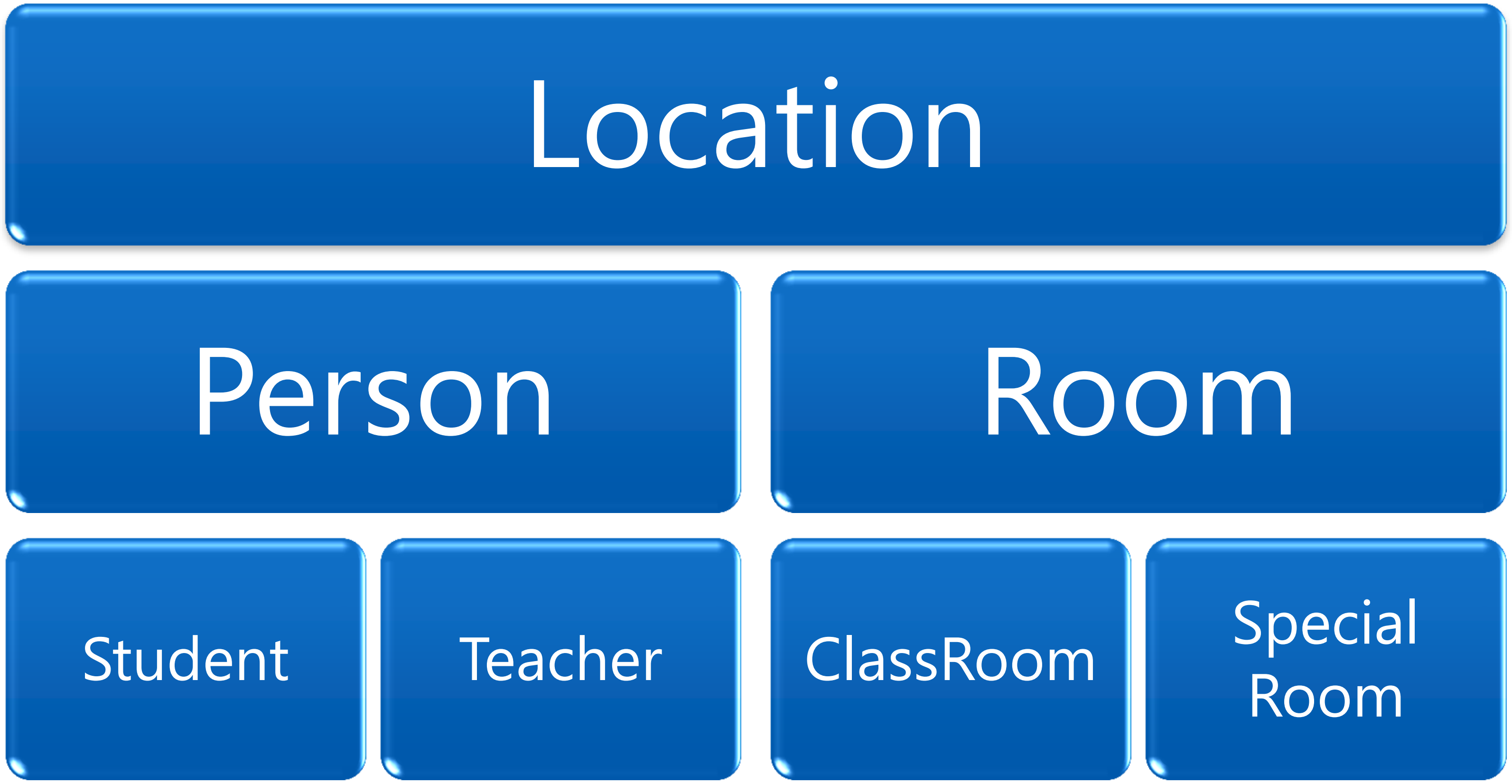
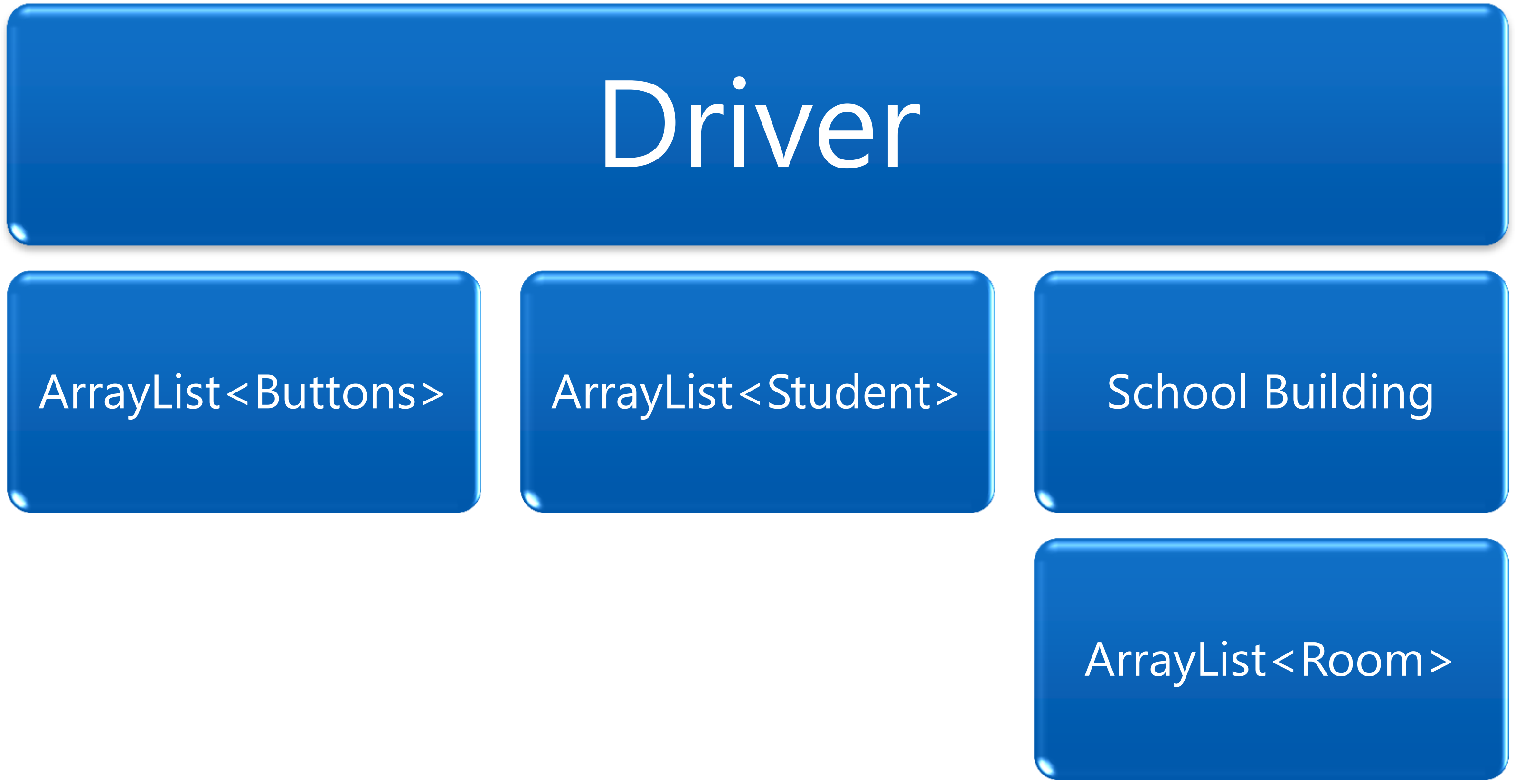
Simulations are…

- Efficient
- Expandable
- Interactive
- Graphical
- Easy to understand

Structure (Classes)

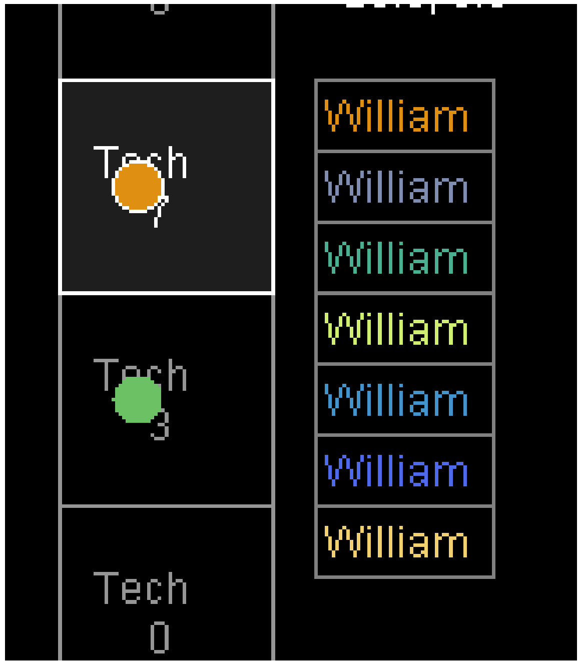


Structure (Hierarchy)



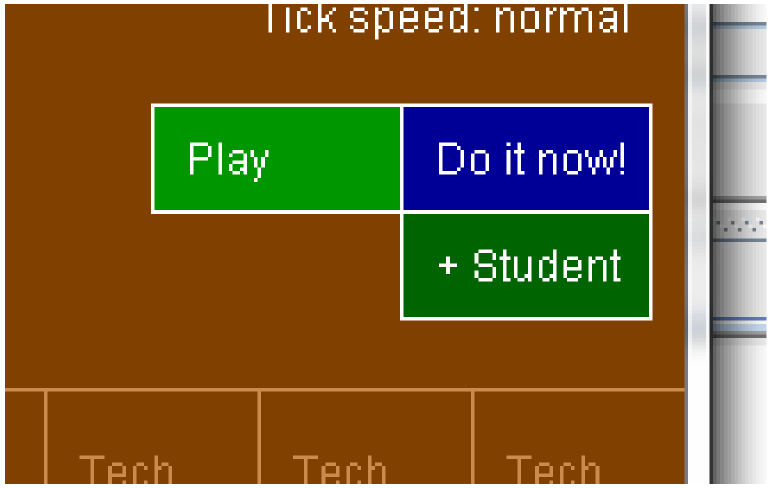
Control (Mouse)

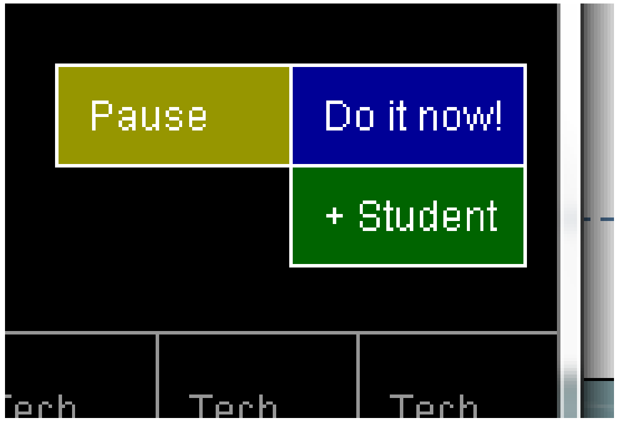
- Left click to select
  - Person
  - Room
  - Button
- Right click to command
  - move



Control (Buttons)

- Play/Pause
  - Continued control
- Do it now!
- + Student



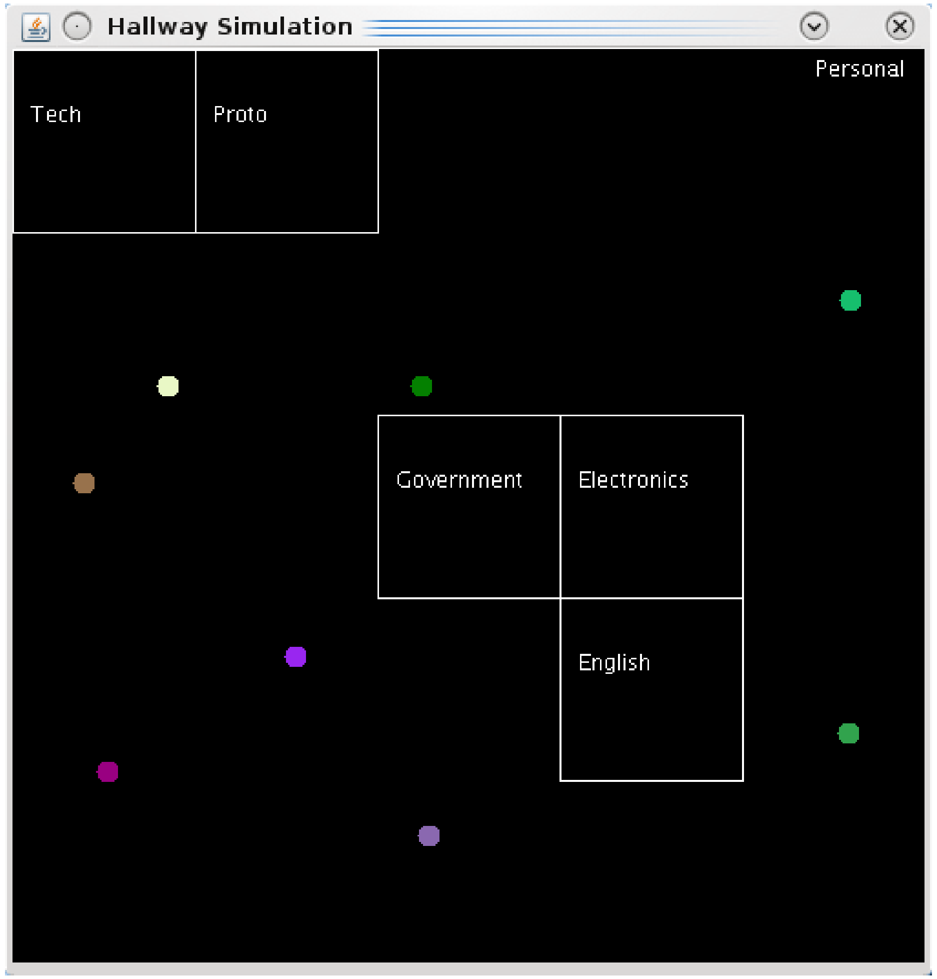


Control (Keyboard)

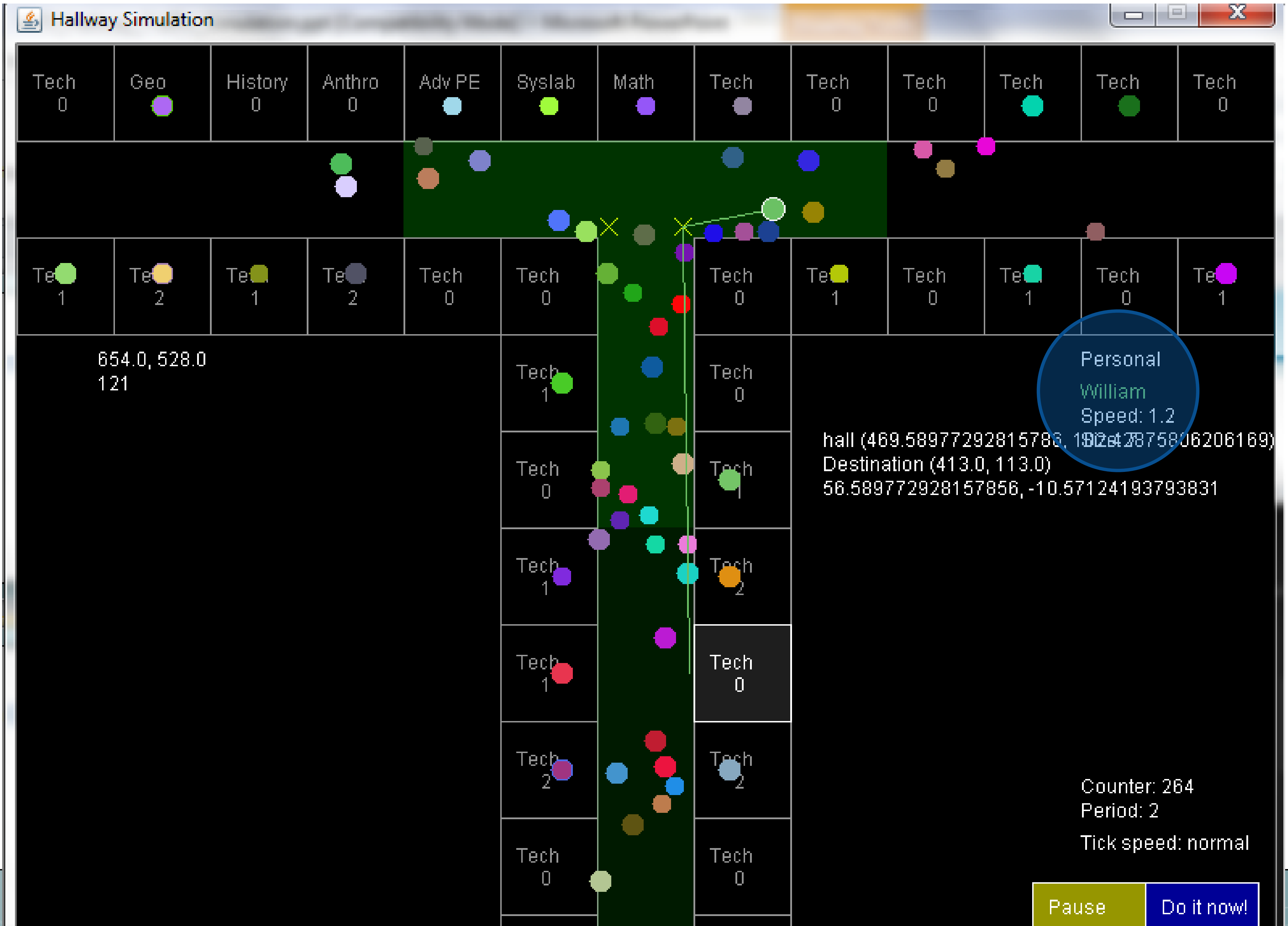
- Up/Down arrow keys
  - 8 speeds (slowest, slow, slower, normal, faster, fast, fastest, ludicrous)
- Shift
  - Elevate action (+ Student, movement)
- Toggle **V**iew
- **R**andomize destination
- **L**ocate selected student

Interface (Q1)

- Barebones
- No buttons
- Incomplete map
- Few students



Interface (Q2)



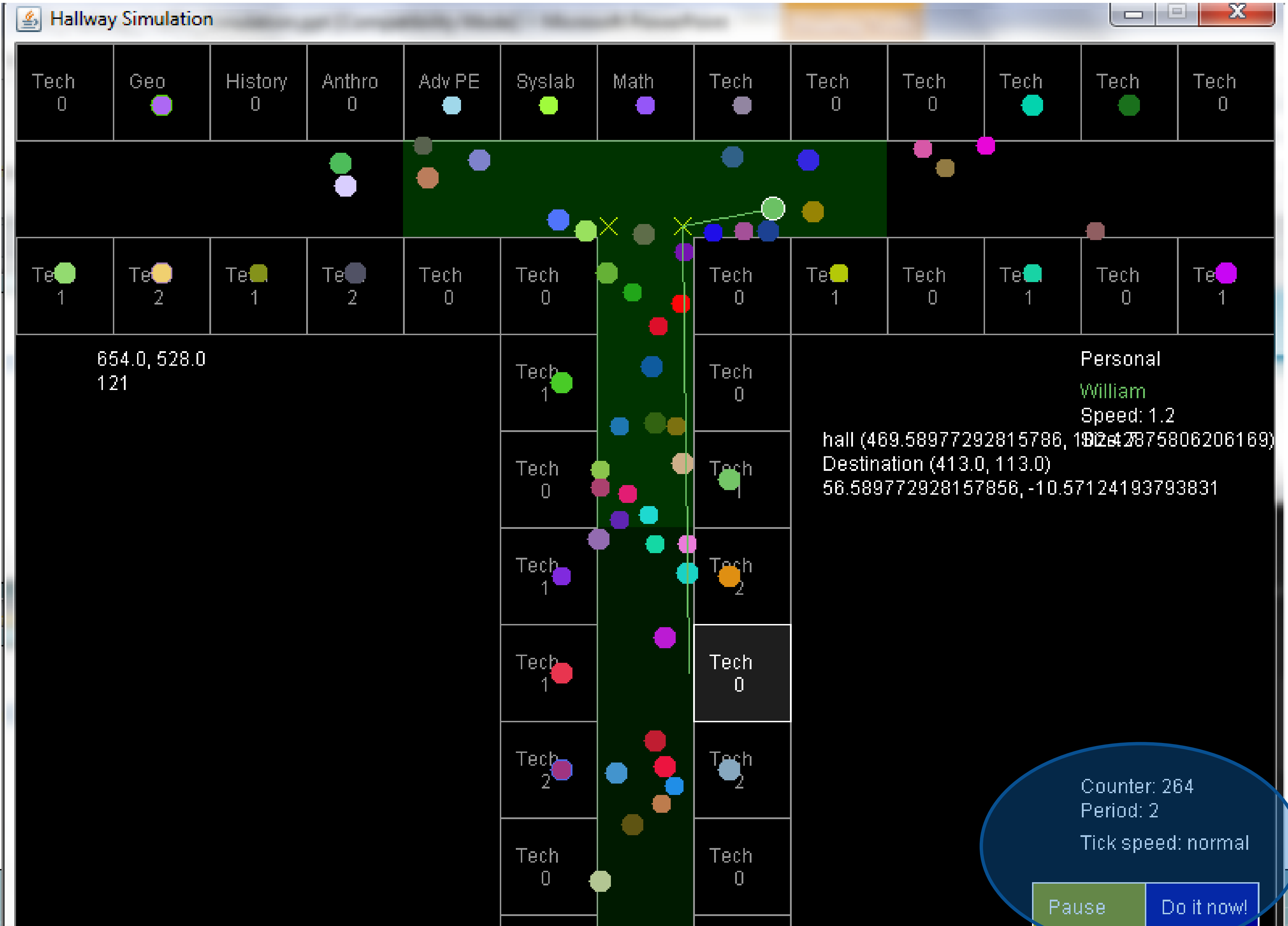
Hallway Simulation

654.0, 528.0
121

hall (469.58977292815786, 102.42875806206169)
Destination (413.0, 113.0)
56.589772928157856, -10.57124193793831

Counter: 264
Period: 2
Tick speed: normal

Interface (Q2)

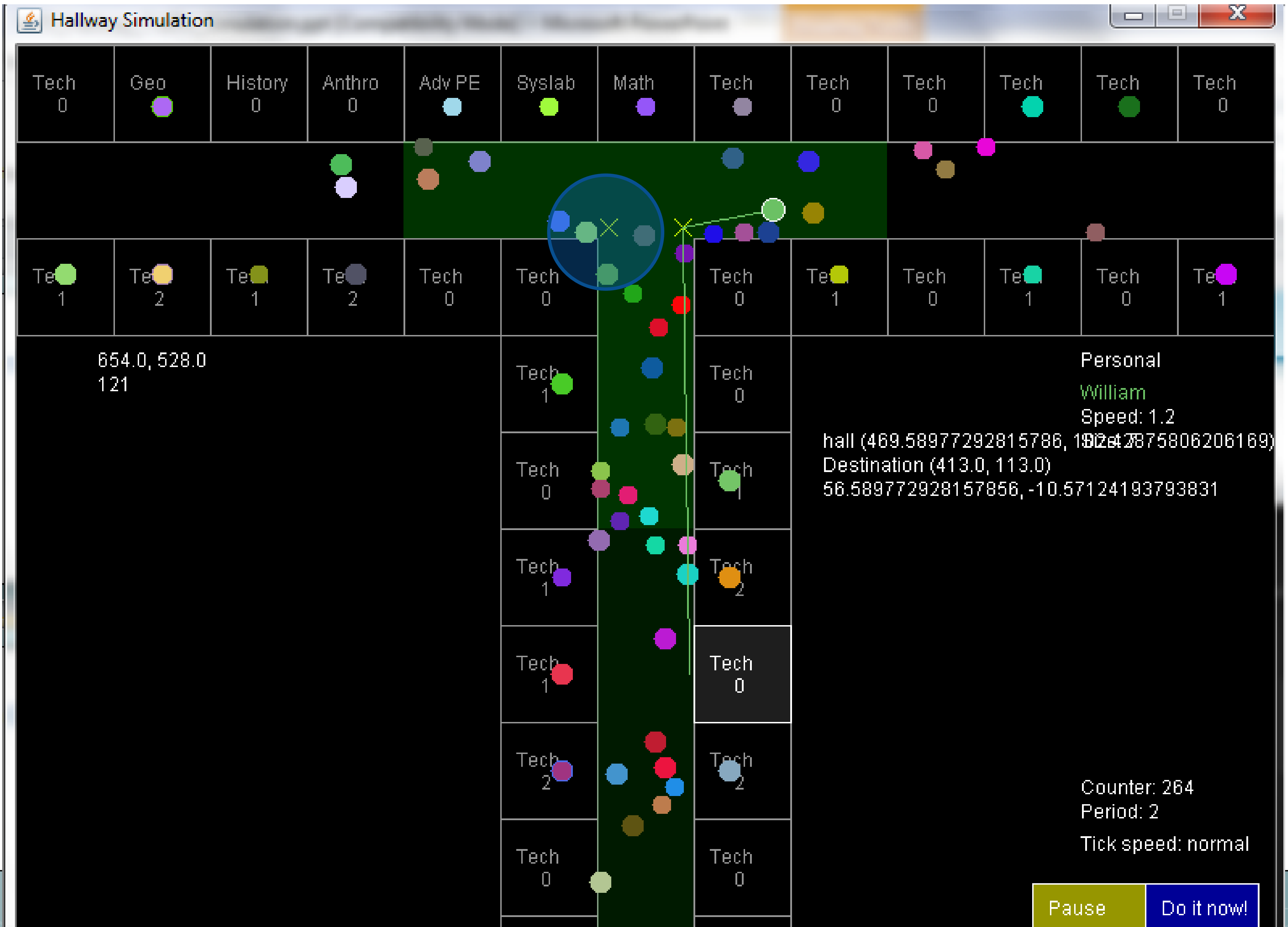


```
654.0, 528.0
121
```

```
Personal
William
Speed: 1.2
hall (469.58977292815786, 102.47875806206169)
Destination (413.0, 113.0)
56.589772928157856, -10.571241937938 31
```

```
Counter: 264
Period: 2
Tick speed: normal
```

Interface (Q2)

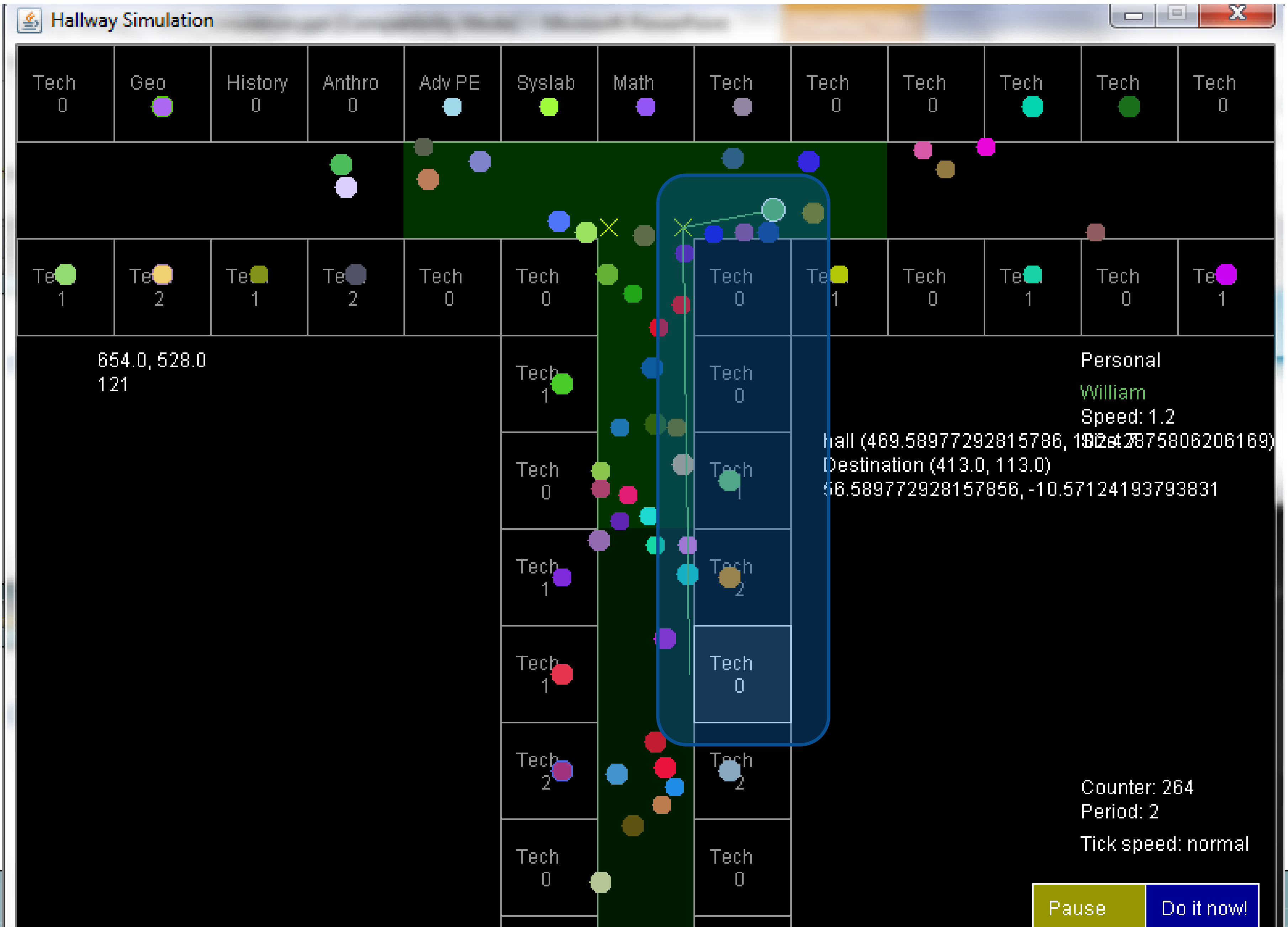


654.0, 528.0
121

Personal
William
Speed: 1.2
hall (469.58977292815786, 192.4787580620169)
Destination (413.0, 113.0)
56.58977292815786, -10.57124193793831

Counter: 264
Period: 2
Tick speed: normal

Interface (Q2)

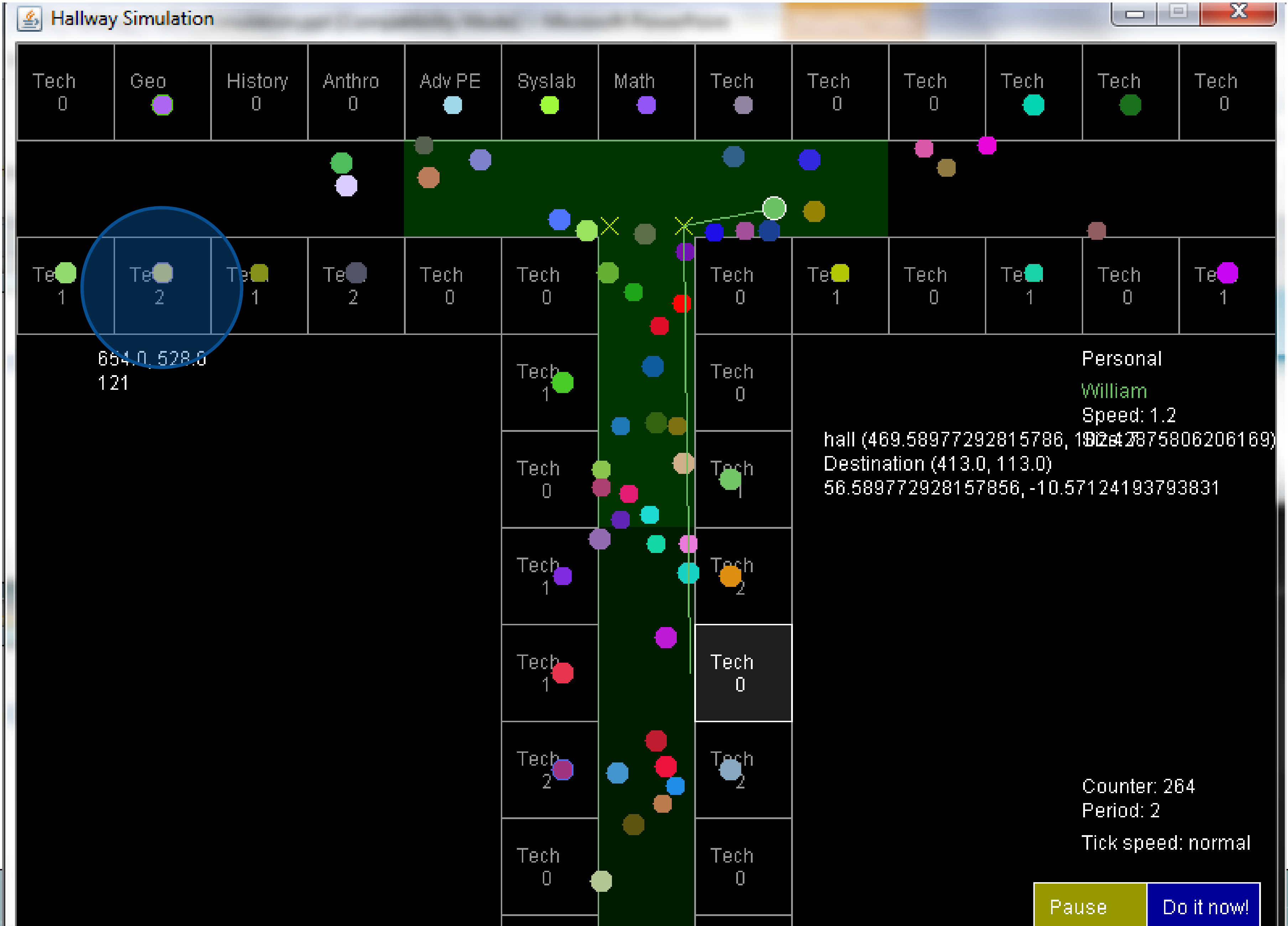


654.0, 528.0
121

Personal
William
Speed: 1.2
hall (469.58977292815786, 102.42875806206169)
Destination (413.0, 113.0)
56.589772928157856, -10.57124193793831

Counter: 264
Period: 2
Tick speed: normal

Interface (Q2)



Hallway Simulation

Tech 0	Geo	History 0	Anthro 0	Adv PE	Syslab	Math	Tech	Tech 0	Tech 0	Tech	Tech	Tech 0
Te 1	Te 2	Te 1	Te 2	Tech 0	Tech 0			Tech 0	Te 1	Tech 0	Te 1	Tech 0	Te 1

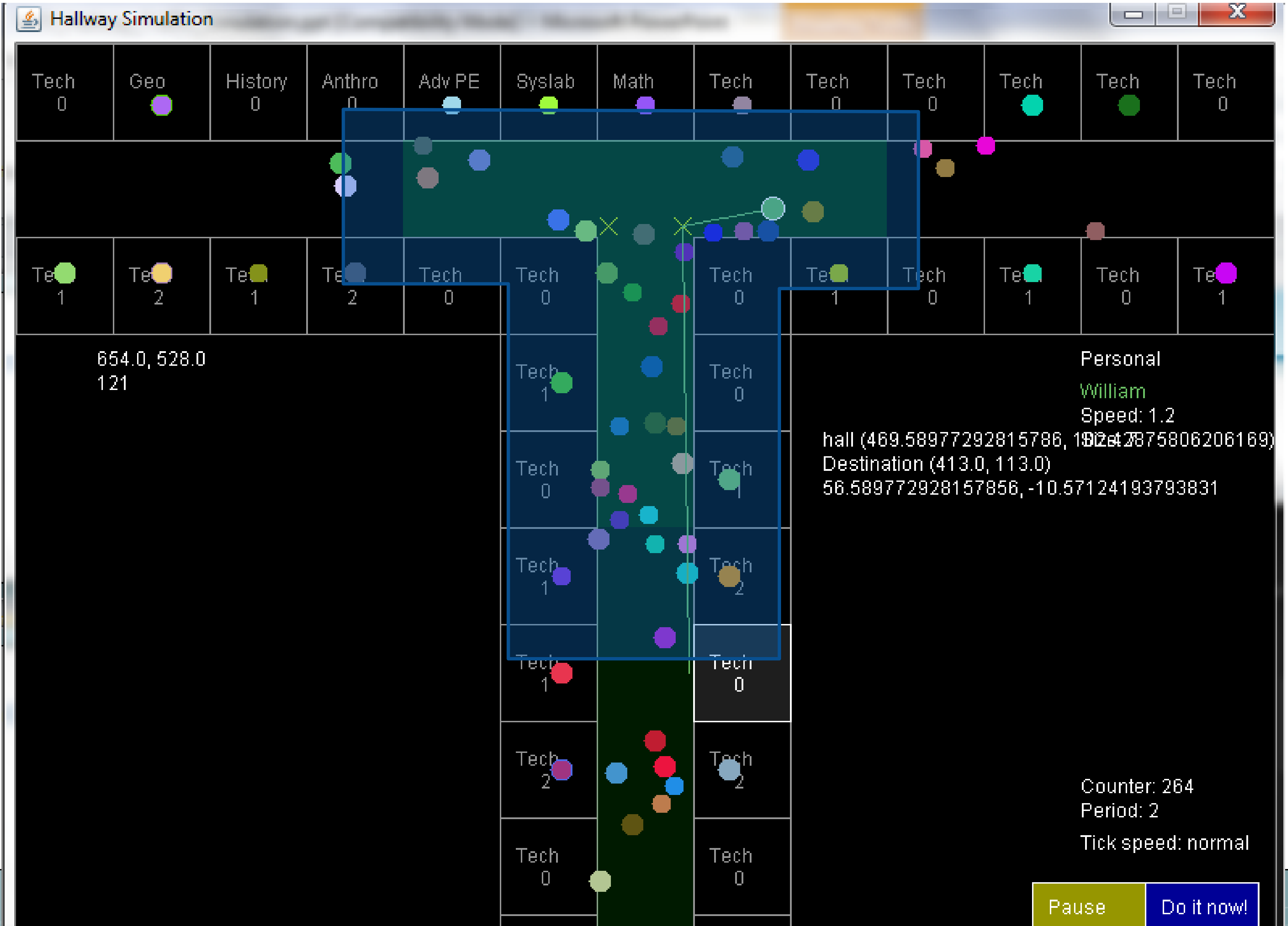
654.0, 528.0
121

Tech 1 | Tech 0
Tech 0 | Tech 1
Tech 1 | Tech 2
Tech 1 | Tech 0
Tech 2 | Tech 2
Tech 0 | Tech 0

Personal
William
Speed: 1.2
hall (469.58977292815786, 1[illegible]4.7875806206169)
Size: 2
Destination (413.0, 113.0)
56.589772928157856, -10.571241937938 31

Counter: 264
Period: 2
Tick speed: normal

Interface (Q2)



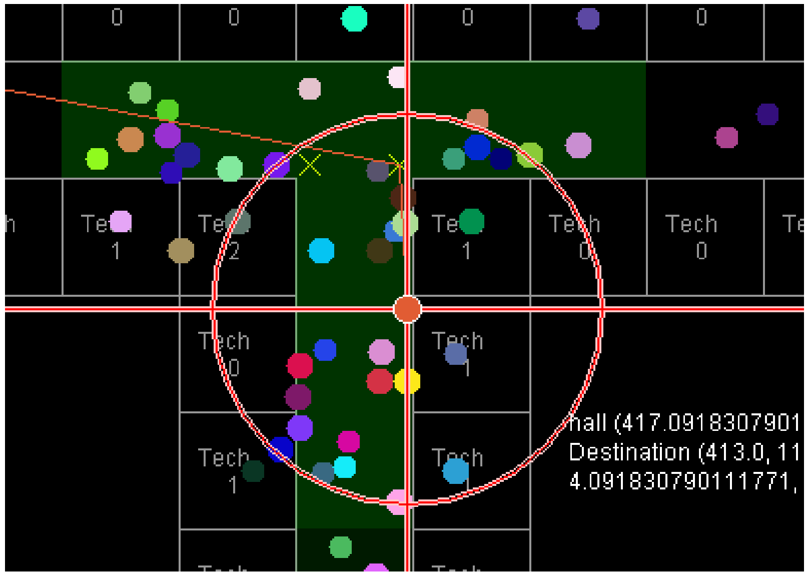
```
654.0, 528.0
121
```

```
Personal
William
Speed: 1.2
hall (469.58977292815786, 102.42875806206169)
Destination (413.0, 113.0)
56.5897729281578 56, -10.57124193793831
```

```
Counter: 264
Period: 2
Tick speed: normal
```

Interface (Q2)

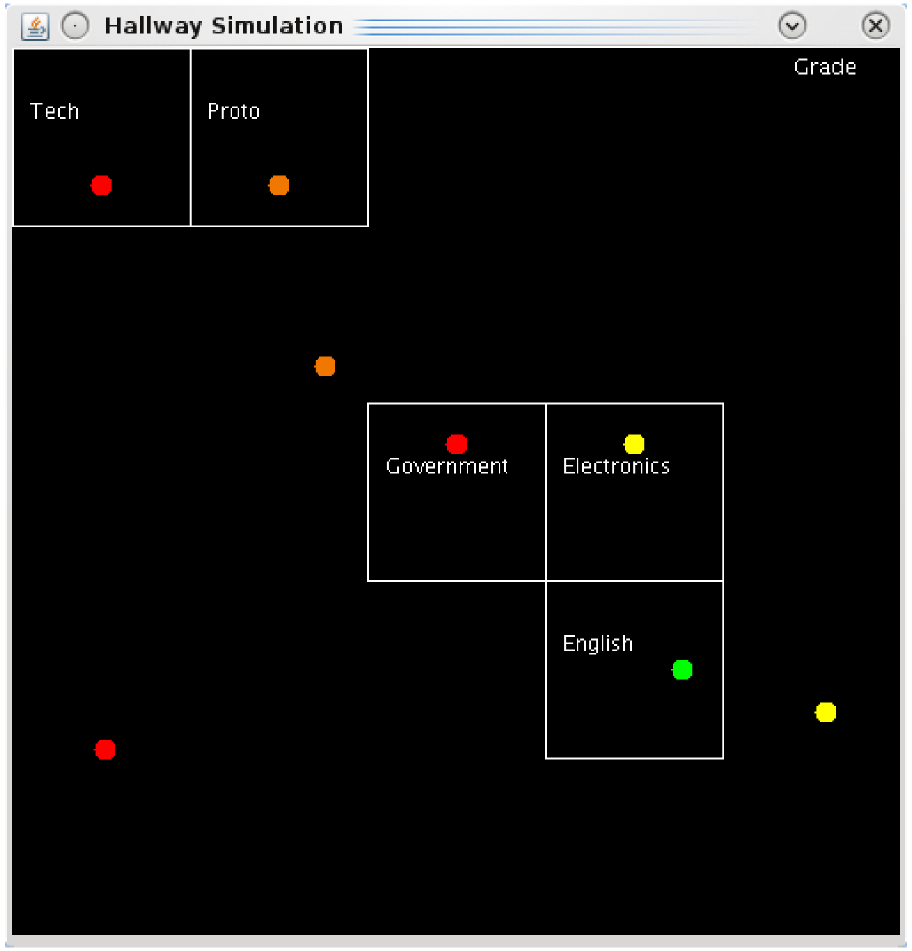
- Location tracker
  - Easy to locate a student



hall (417.0918307901
Destination (413.0, 11
4.091830790111771,

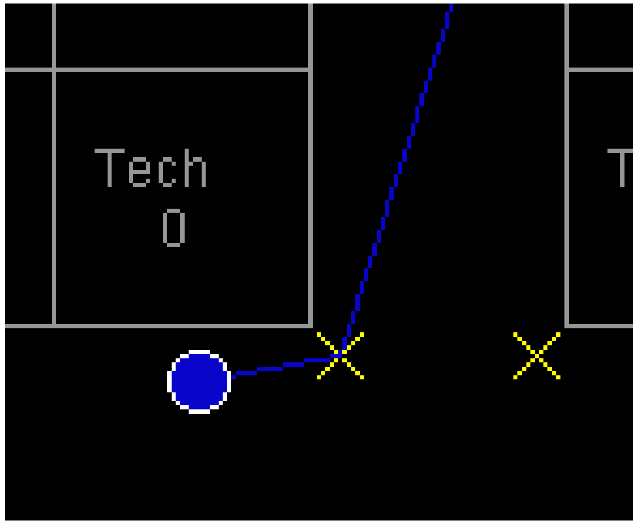
Background (Q1)

- Integer-based grid
- One pixel movement along axes.
- No path-finding
- No inter-student interactions



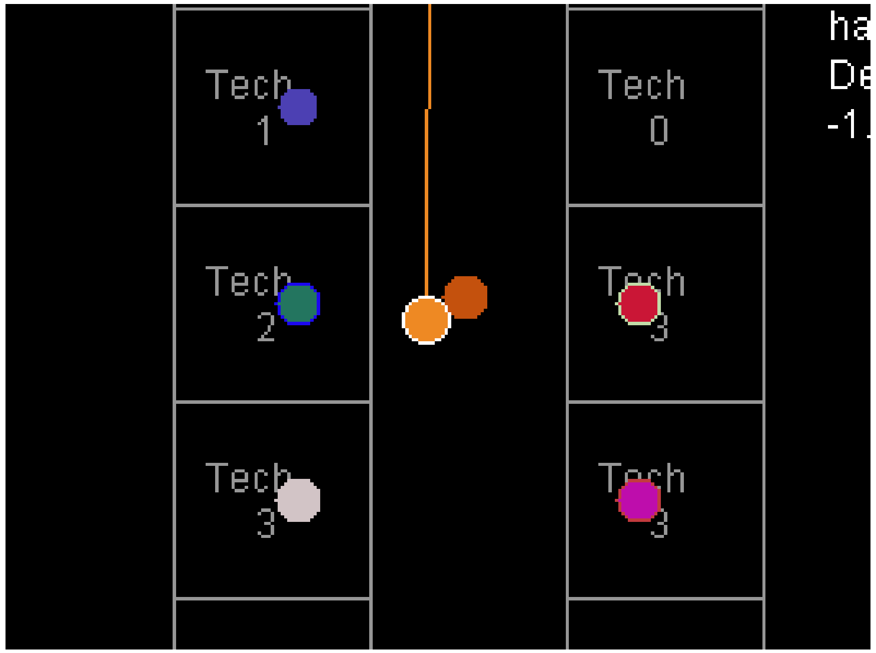
Background (Q2)

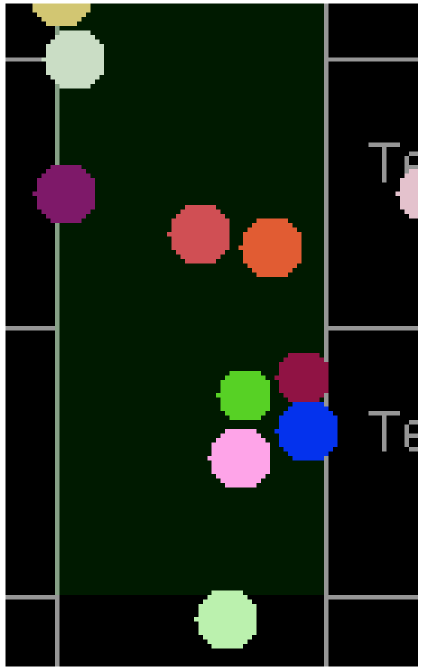
- Float-based grid
- Different speeds
- Movement in any direction



Background (Q2)

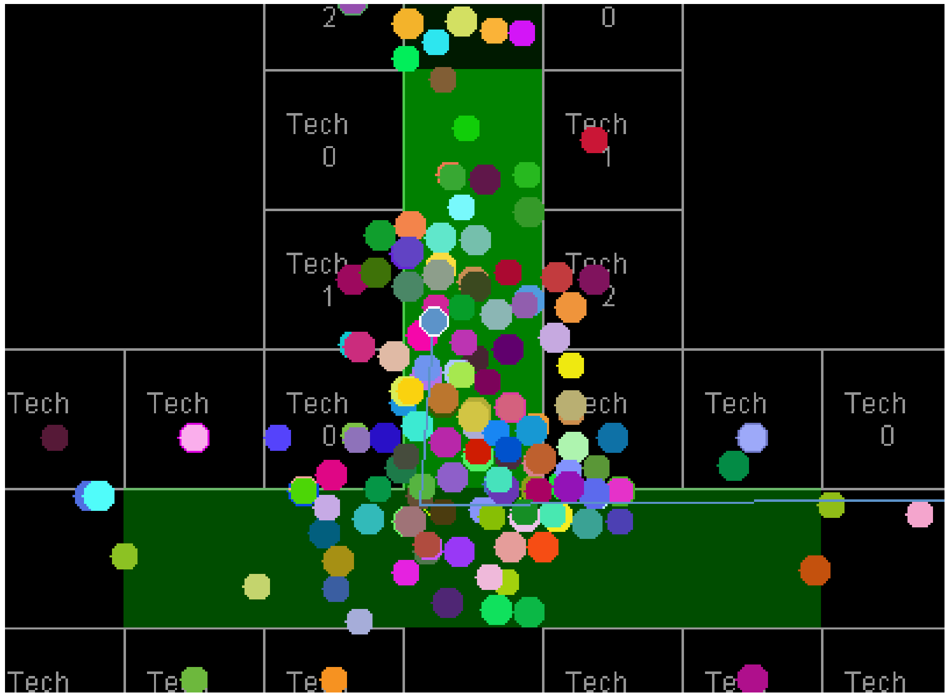
- Collision detection

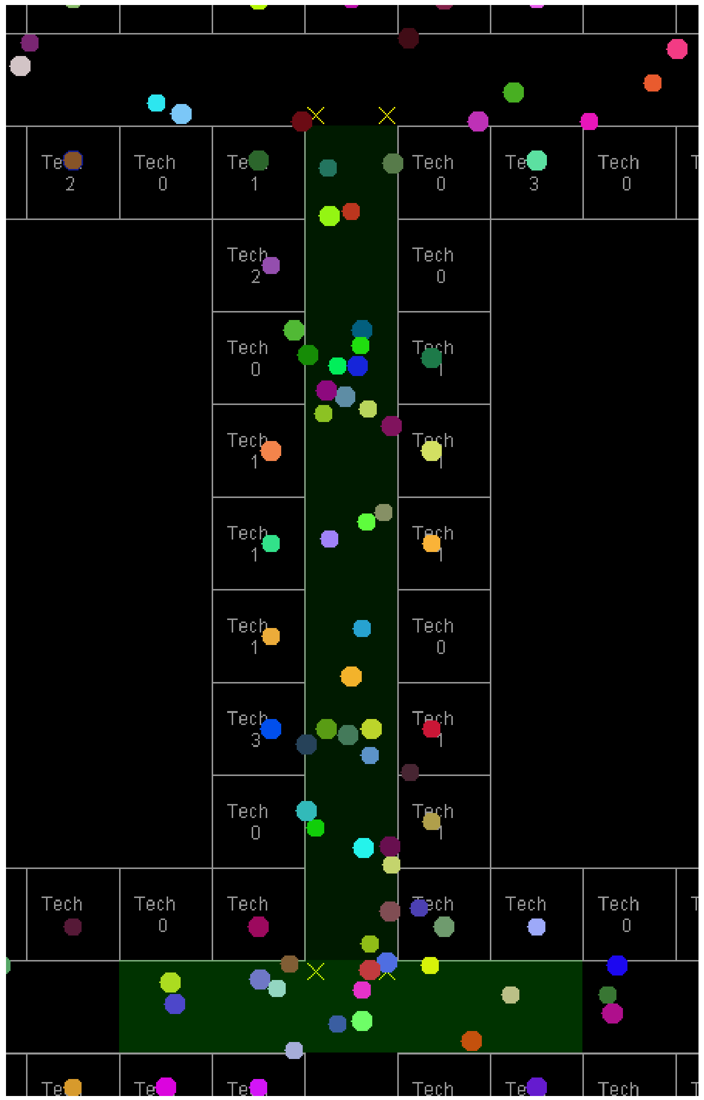


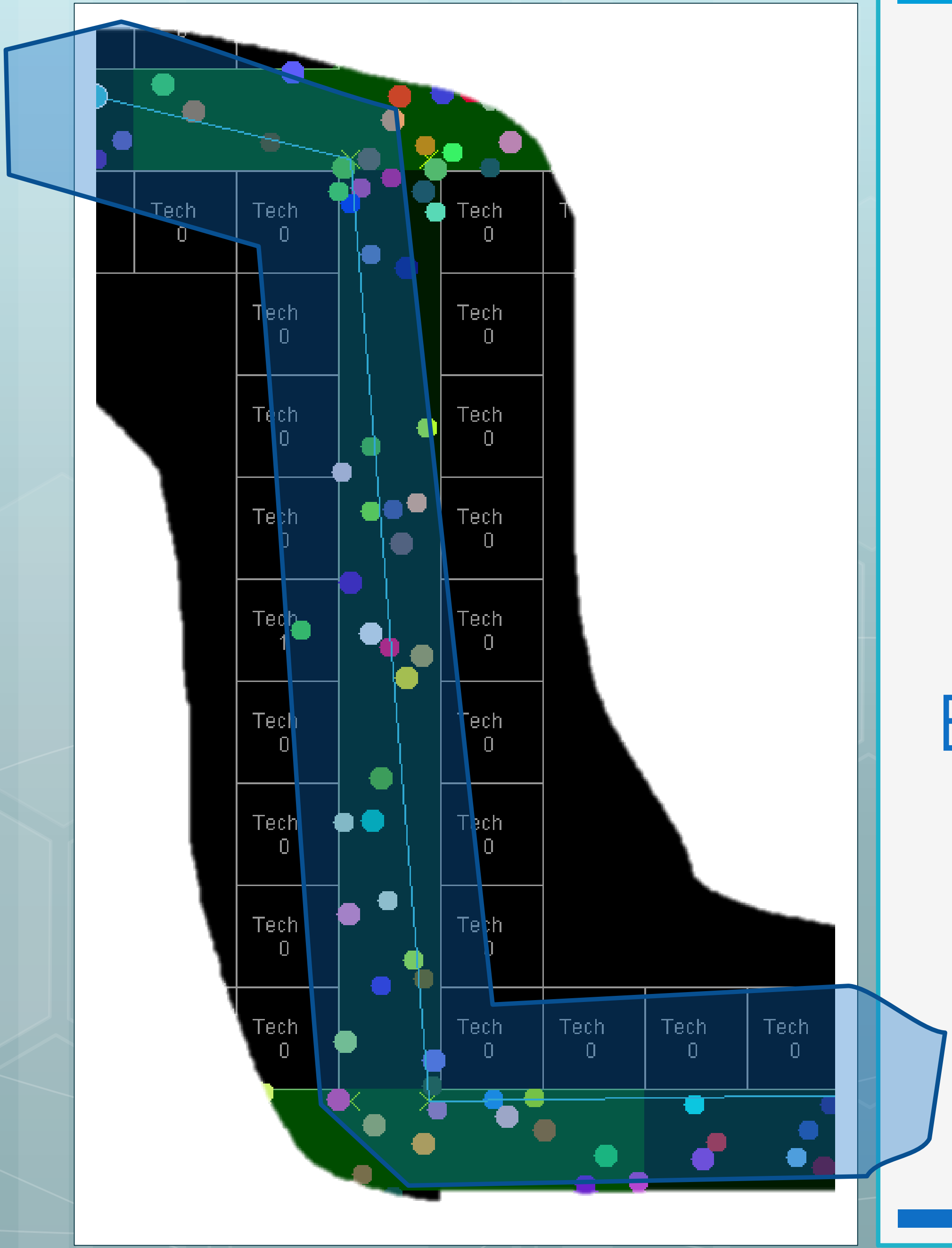


Background (Q2)

- Quantifying information







Background (Q2)

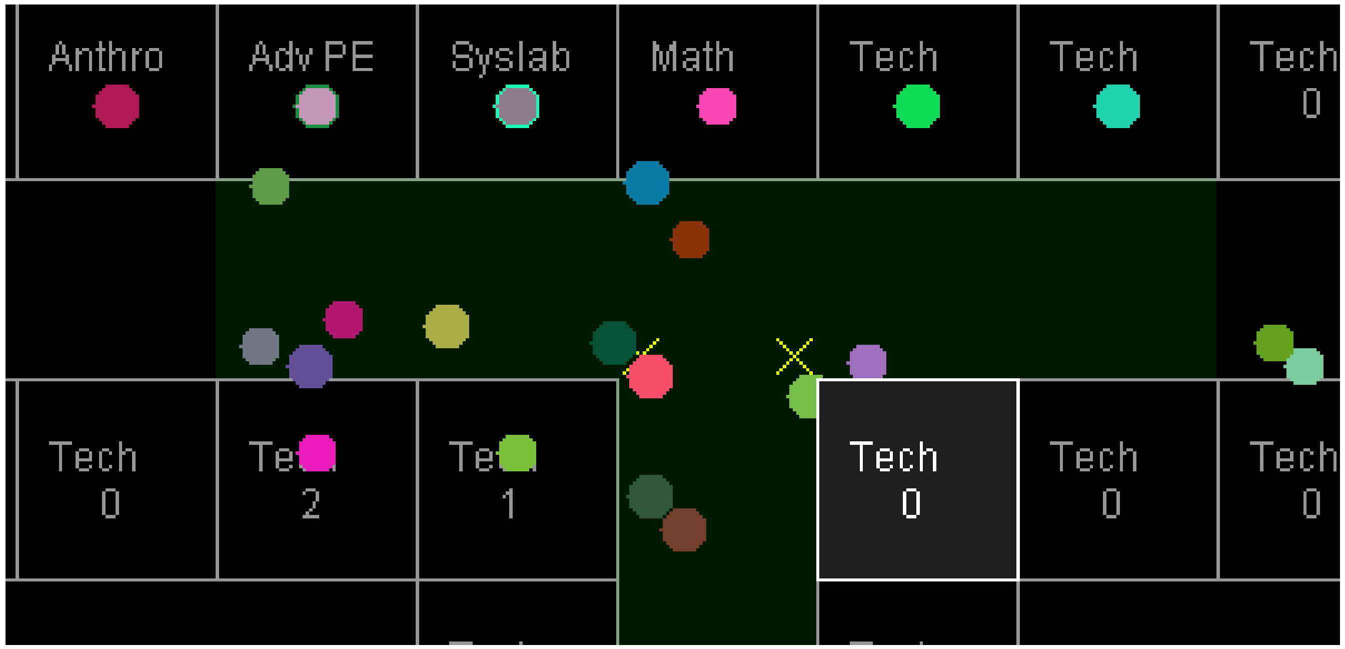
- Path-finding
  - Breadth-first search with iterative deepening

Background (Q2)

- Schedules
-
```
public Room[] generateSchedule()
        {
            Room[] s = new Room[numPeriods];
            for(int n = 0; n < numPeriods; n++)
                s[n] = getRandomClassRoom();
            return s;
        }
```
-
```
public void incrementPeriod(double percentage)
        {
            for(Student s : students)
                if(!s.isMoving && Math.random() < percentage)
                    if(!s.getSchedule()[period-1].contains(s.getLoc().getX(),
                                                           s.getLoc().getY()))
                        s.forceNewDestination(s.getSchedule()[period-1], school);
        }
```

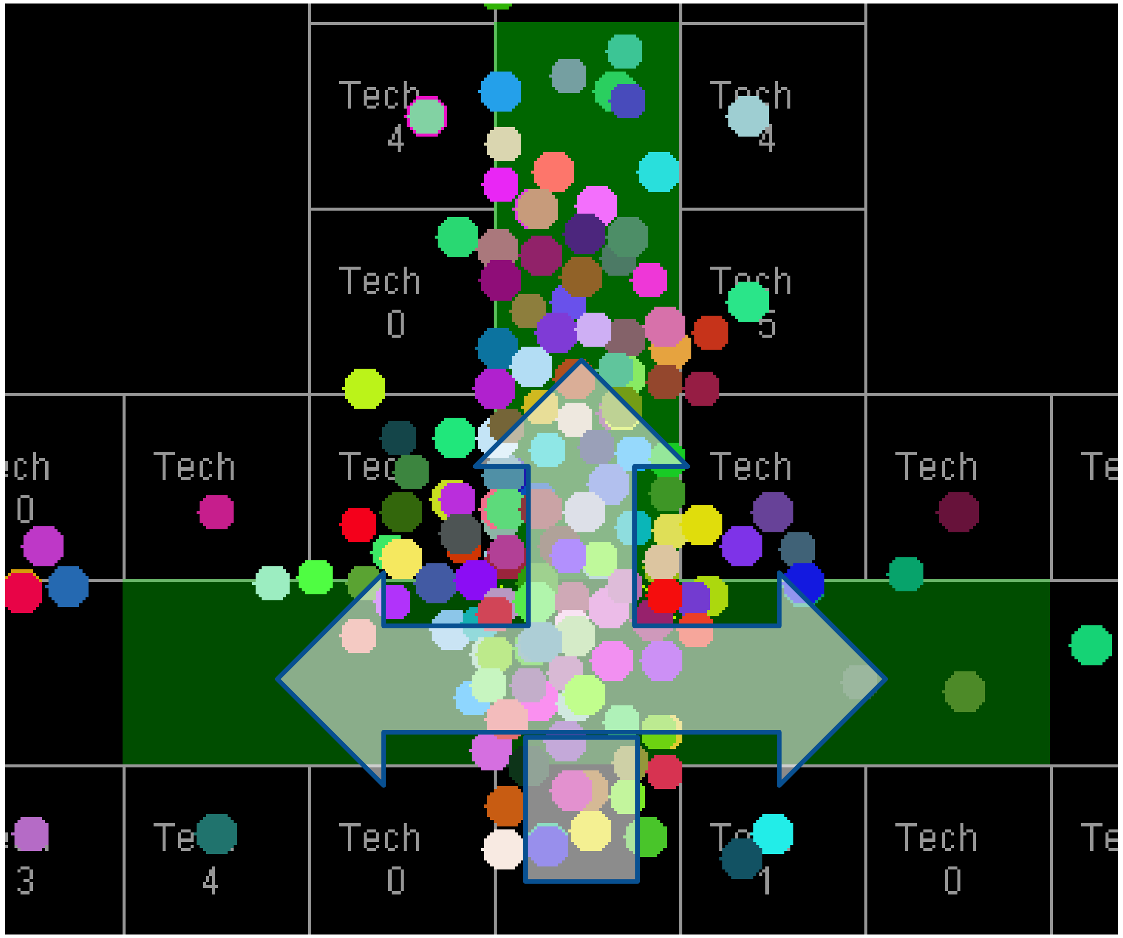
Background (Q2)

- Staggered releases



Background (Q2)

- Spawn locations



Summary (Q2)

Control	Interface	Framework
• Mouse (improved) • Buttons • Keyboard commands	• Buttons • Contextual information (improved) • Visual cues • Quantitative output	• Path-finding • Collision detection • Precise grid • Staggered releases • Realistic spawn points • Student-specific scheduling

What's Next?

- Fix collision detection
- Social interactions
- Complete school map