System modelling and simulation

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https://github.com/ddworak/formin

formin

Lab 2

Configuration

1. **FSE** - foraminifera start energy; FSE ∈ [0,1] && FSE ∈ R.
2. **FRC** - foraminifera Reproduction Cost; FRC ∈ [0,1] && FRC ∈ R.
3. **FRT** - foraminifera reproduction threshold; FRT ∈ [0,1] && FRT ∈ R.
4. **FMC** - foraminifera movement cost; FMC ∈ [0,1] && FMC ∈ R.
5. **ARF** - algae reproduction frequency; ARF ∈ N.
6. **AEC** - algea energetic capacity**;** AEC ∈ [0,1] && AEC ∈ R.
7. **SSR** - signal speed ratio; SSR ∈ [0,1] && SSR ∈ R.
8. **DFF** - diffraction factor**;** DFF ∈ [0,1] && DFF ∈ R.
9. **ATF** - attenuation factor; ATF ∈ N.
10. **SPF** - global suppression factor of the signal; SPF ∈ [0,1] && SPF ∈ R.
11. **GS** - grid size**;** GS ∈ N, where map size is GSxGS.
12. **FAR** - starting foraminifera algae ratio; FAR ∈ [0,1] && FAR ∈ R.

Assumptions

Additional assumptions to those from articles: ‘Dynamic Assignment of Tasks to Mobile Robots in Presence of Obstacles’ and ‘Agent-oriented Foraminifera Habitat Simulation’:

1. Cell state(algae/foraminifera/nothing/obstacle) is in the central sub cell [x,y] = [0,0].
2. Algae after reproduction randomly picks one empty cell from its surroundings and puts a descendant there.
3. Algae is immortal. It disappears only when eaten.
4. If algae cannot reproduce because of lack of free cells around it, it pauses. This results in reproducing action(ARF reset).
5. Foraminifera during reproduction picks randomly one free cell from surroundings and puts a descendant there.

Questions

1. Does foraminifera change their size on energy increase?
2. Does foraminifera disintegrate during reproduction?
3. Does foraminifera die with energy level insufficient to make any action? Does it have a vegetation cost?