

Agent-Based Models as an inclusive and accessible surrogate to field-based studies.

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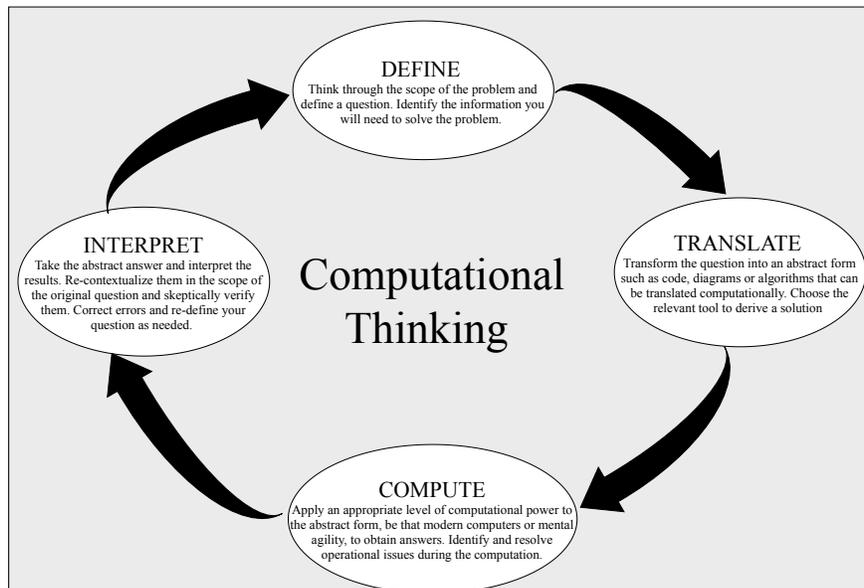
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Abstract

Barriers to fieldwork exist for many reasons such as physical ability, financial cost, and time availability. Unfortunately, these barriers disproportionately affect minority communities and create a disparity in access to fieldwork experience in the natural science community. Travel restrictions and the global lockdown has extended this barrier to fieldwork across the community and led to increased anxiety about gaps in productivity, especially for graduate students and early-career researchers. In this paper, we discuss Agent-Based Modeling as an open-source, accessible, and inclusive resource to substitute for lost fieldwork during COVID-19 and future scenarios of travel restrictions such as climate change. We detail the process of model development with a plethora of examples from the literature on how Agent-Based Models can be applied broadly across life-science research. We aim to amplify awareness and adoption of this technique to broaden the diversity and size of the Agent-Based Modeling community in ecology and evolutionary research. We also describe the benefits of Agent-Based models as a teaching and training resource for students across education levels. Finally, we discuss the current challenges facing Agent-Based Modeling and discuss how the field of quantitative ecology can work in tandem with traditional field ecology to improve both methods.

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A

Interface Info Code

Edit Delete Add | normal speed | view updates | Settings... | **A**

ticks: 0

number-of-nodes 150

average-node-degree 6

initial-outbreak-size 3

setup go

virus-spread-chance 9.1 %

virus-check-frequency 1 tick/s

recovery-chance 5.0 %

gain-resistance-chance 5 %

Network Status

% of nodes

time 52

■ susceptible

■ infected

■ resistant

B

Interface Info Code

Find... Check | Procedures | Indent automatically | **B**

```
to become-infected ;; turtle procedure
  set infected? true
  set resistant? false
  set color red
end
```

