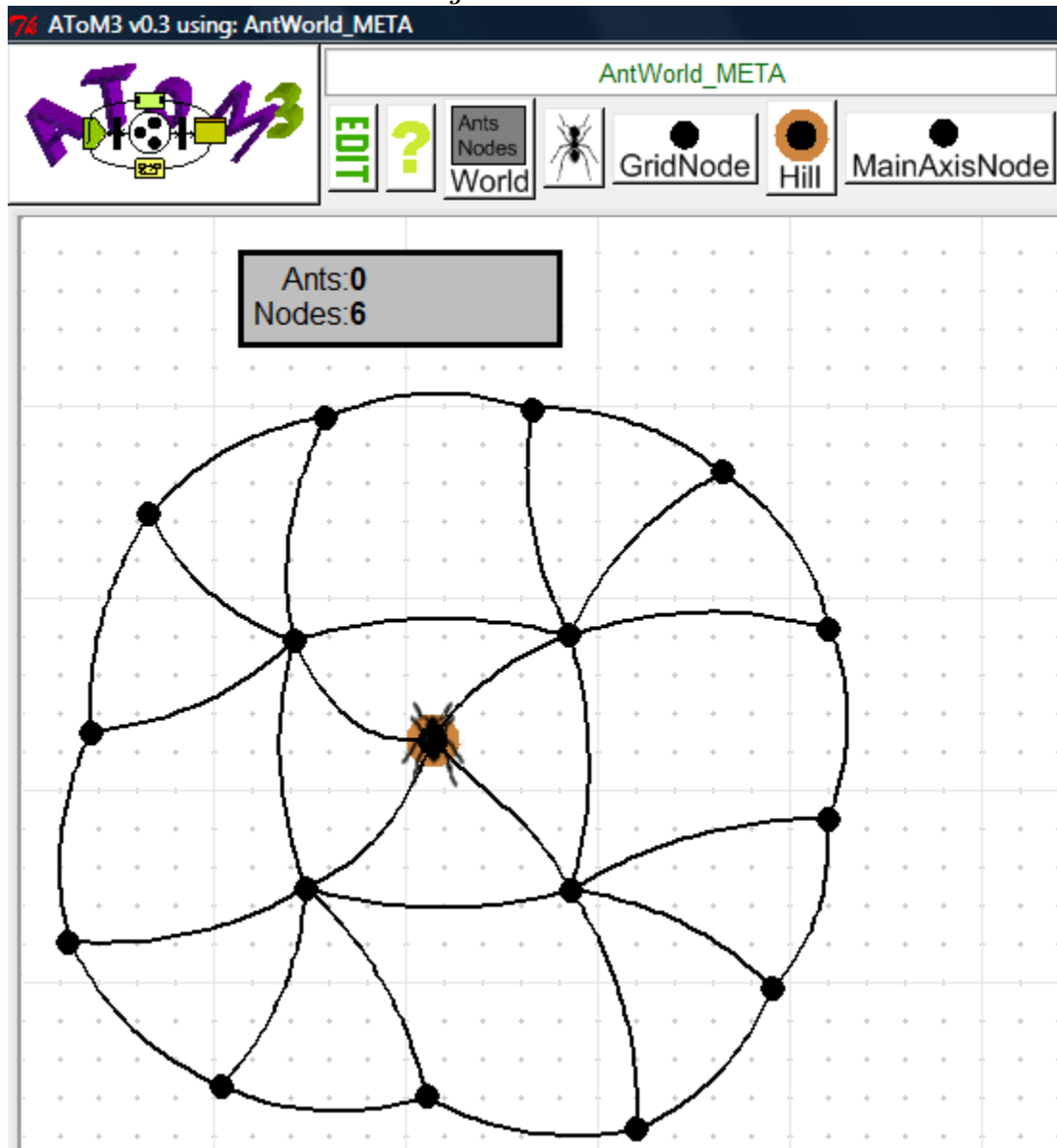


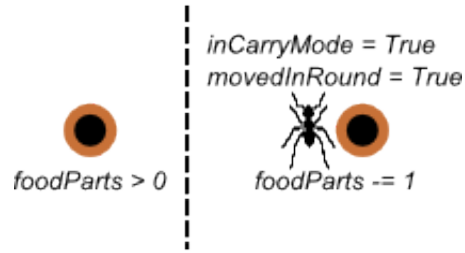
## Appendix A

This appendix shows the complete set of the rules used for the AntWorld simulation. A screenshot of AToM<sup>3</sup> is also provided, showing the input model used for the experiments. The full AToM<sup>3</sup> as well as the rules and model of transformation can be downloaded from [http://moncs.cs.mcgill.ca/people/eugene/15\\_MoTif#AntWorld](http://moncs.cs.mcgill.ca/people/eugene/15_MoTif#AntWorld).

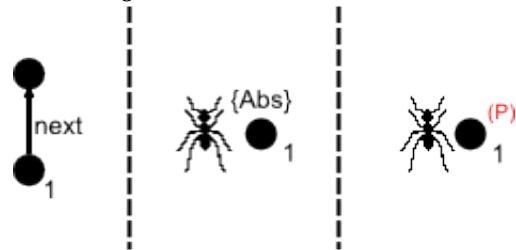
*Fig. 1. Initial Model*



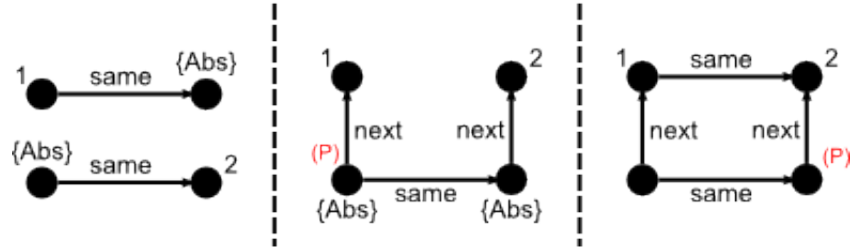
*Fig. 2. antBirth*



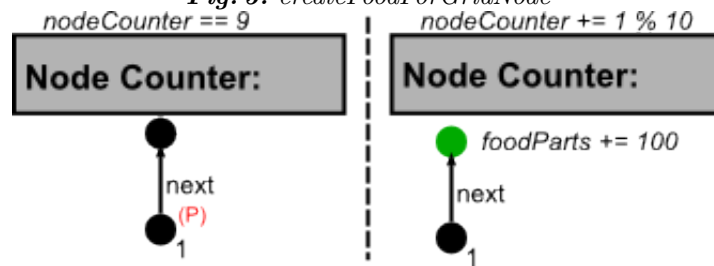
*Fig. 3. checkAntOnOutCircle*



*Fig. 4. connectNodesInSameCircle*



*Fig. 5. createFoodForGridNode*



*Fig. 6. createFoodForMainAxisNode1*

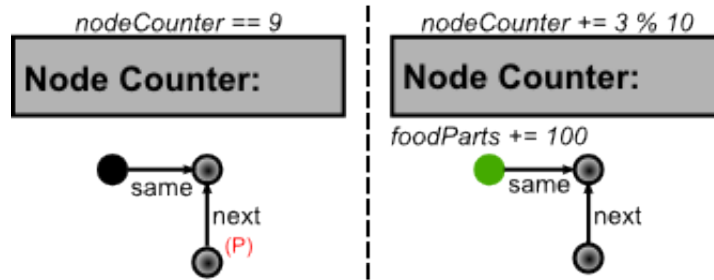


Fig. 7. *createFoodForMainAxisNode2*

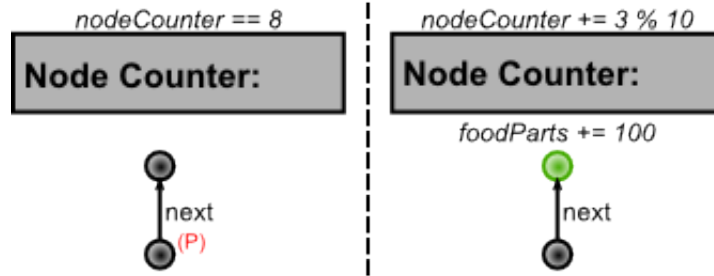


Fig. 8. *createFoodForMainAxisNode3*

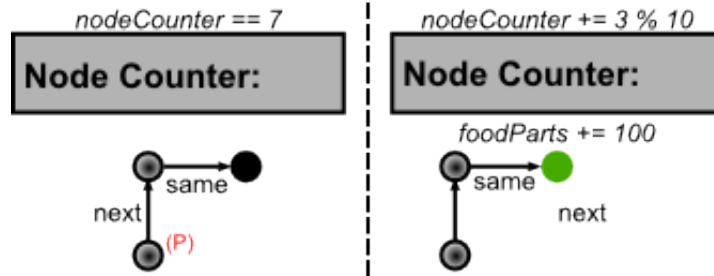
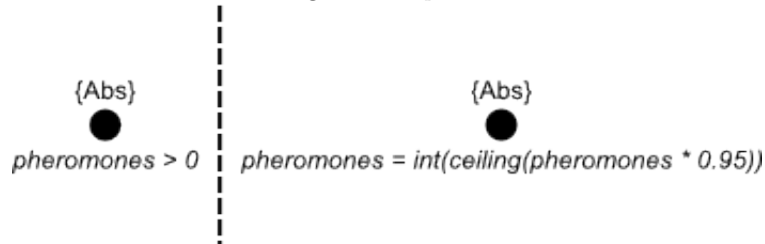


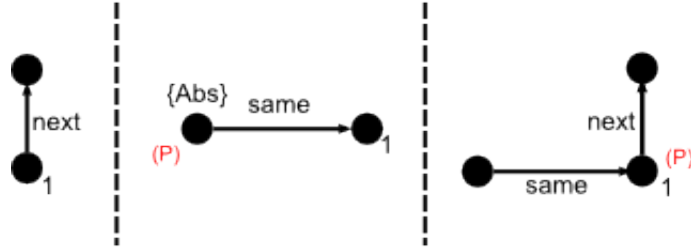
Fig. 9. *dropFood*  
 $inCarryMode = True$  |  $inCarryMode = False$   
 $movedInRound = False$



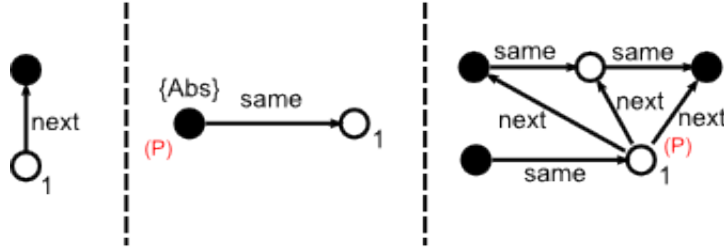
Fig. 10. *evaporate*



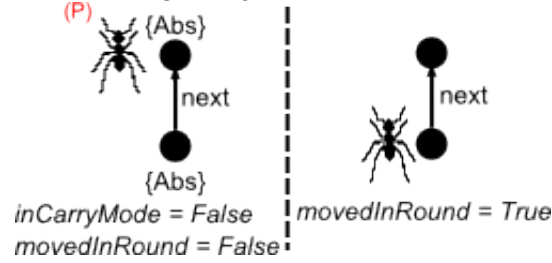
*Fig. 11. generateGridNode*



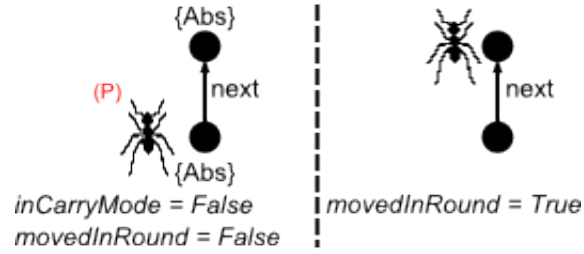
*Fig. 12. generateMainAxisNode*



*Fig. 13. goToNextNodeIn*



*Fig. 14. goToNextNodeOut*



*Fig. 15. goToNodeWithPheromones*

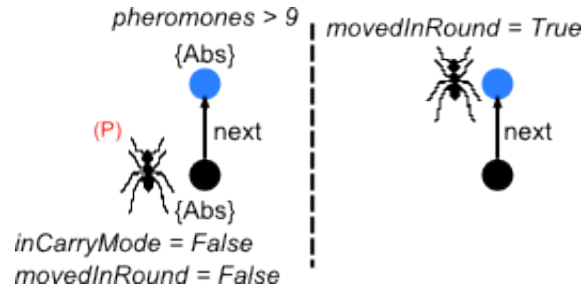


Fig. 16. *goToSameNodeIn*

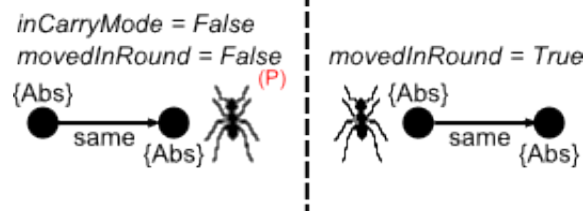


Fig. 17. *goToSameNodeOut*

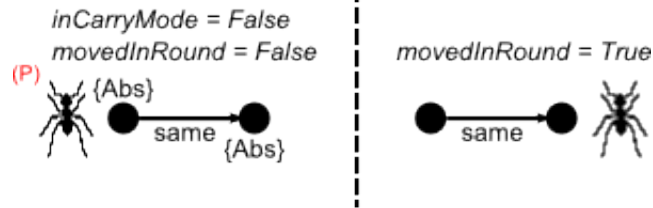


Fig. 18. *grabFood*

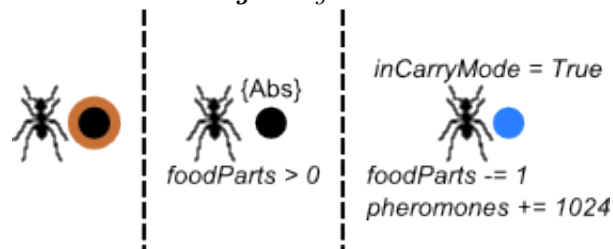
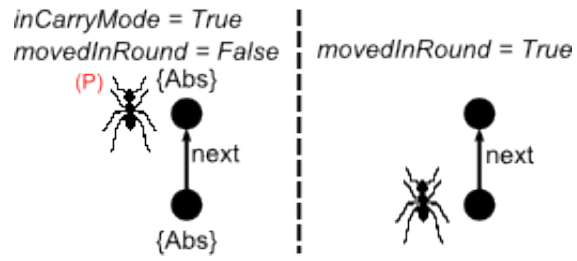
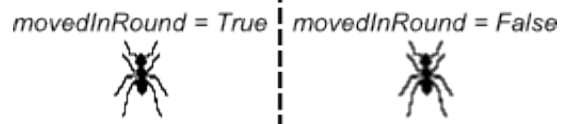


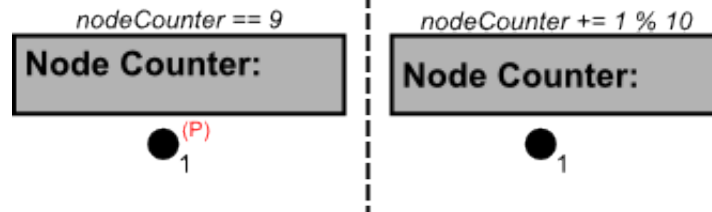
Fig. 19. *moveTowardsHill*



**Fig. 20.** *resetAntMoveTracker*



**Fig. 21.** *updateNodeCounterForGridNode*



**Fig. 22.** *updateNodeCounterForMainAxisNode*

