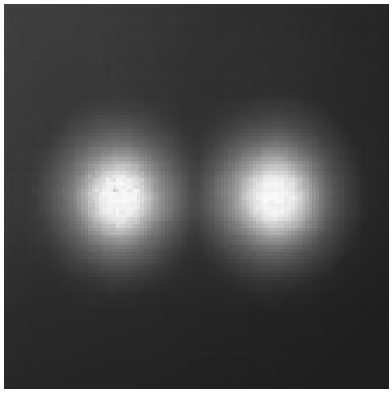
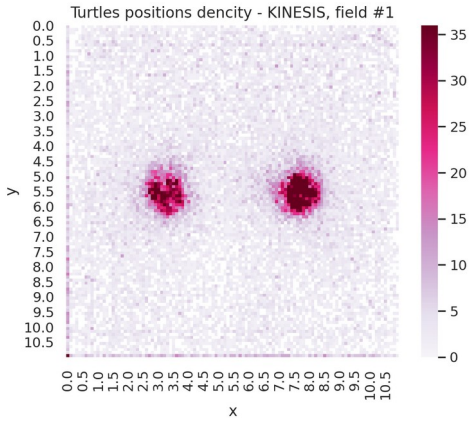
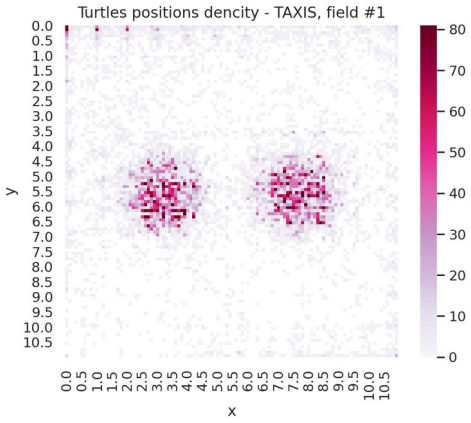
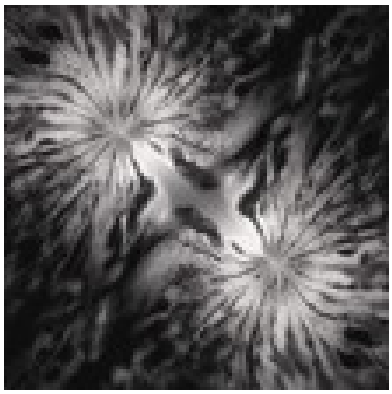
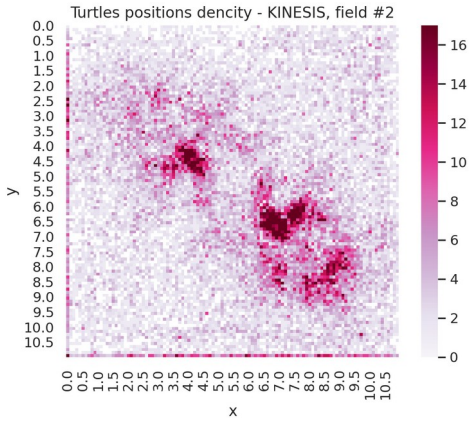
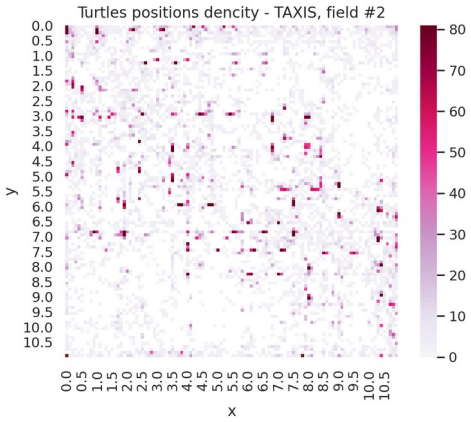
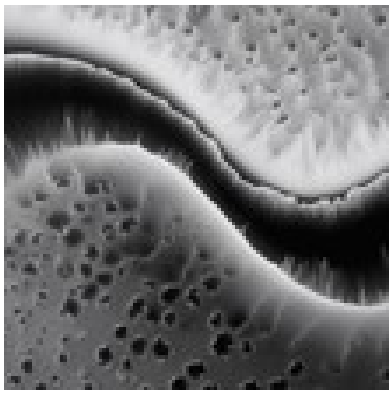
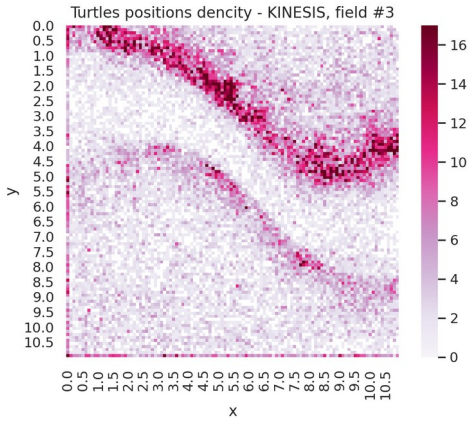
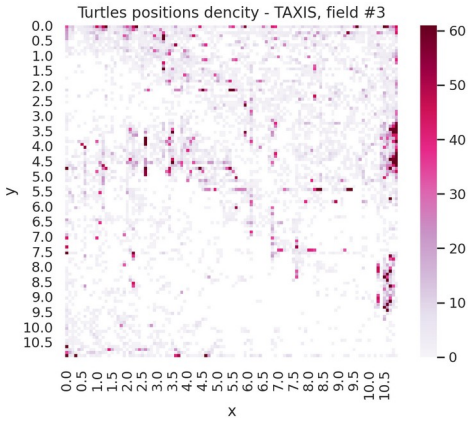
MOTION BEHAVIORS TEST RESULTS

Turtles count: 75, behavior / field test duration = 10 min.

The graphs show density of requests — how often the turtles request at each position for the temperature field. They can only request temperature while they aren't moving.

Table 1. Number of requests at position.

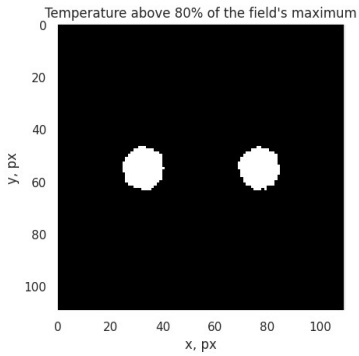
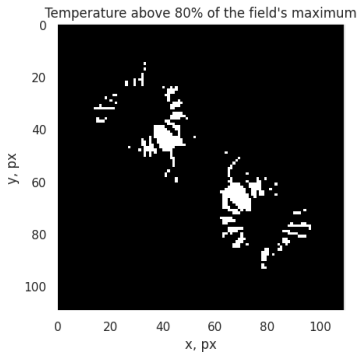
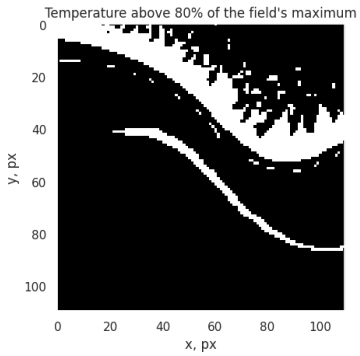
FIELD	KINESIS	TAXIS
		
		
		

Which Movement Pattern Is More Efficient?

Here, efficiency is defined as the proportion of temperature queries made within high-temperature zones:

- Regions above 80% of maximum temperature identified as “high-temperature zones” using a mask.
- All position queries (requests) by turtles recorded during trials.
- For each behavior, calculated:
  Proportion = (Number of requests in high-temp zones) / (Total requests in all zones)
- This proportion serves as a quantitative measure of effectiveness (preferential movement toward targets).

Table 2. Proportion of Requests in High-Temperature Zones (%).

BEHAVIOR / FIELD	FIELD 1	FIELD 2	FIELD 3
			
KINESIS	28%	13%	38%
TAXIS	37%	4%	25%

In fields with a simple bimodal temperature distribution, the TAXIS behavior demonstrates slightly higher efficiency compared to KINESIS. However, as field complexity increases, neither behavior consistently outperforms the other.

It is important to note that both the KINESIS and TAXIS models employed here are deliberately simple. In more complex or realistic simulations, the relative effectiveness of these behaviors may differ, potentially favoring more advanced or adaptive strategies.