

## Narrative Contribution Description

Our commit history graph describes each members' individual contributions very poorly. GitHub did not register most of Gabriel's commits as coming from him. He eventually found the issue, but none of his commits before then are not listed on the activity graph. Here are screenshots of Gabriel's commits that do not show up on the contributors graph:

The image displays four screenshots of GitHub commit pages for the repository AdamMEI/PopulationPlayground. Each screenshot shows a commit by 'Gabe' (Gabriel Schepman) that is not reflected in the contributors graph. The commits are as follows:

- Commit 1:** "Added predator movement, simulation stop, visualization fps, ..." (main branch). Authored and committed 2 weeks ago. Showing 1 changed file with 196 additions and 21 deletions.
- Commit 2:** "Updated comments on movement and reproduction" (main branch). Authored and committed last week. Showing 1 changed file with 313 additions and 138 deletions.
- Commit 3:** "implemented prey movement, and reproduction" (main branch). Authored and committed last week. Showing 1 changed file with 253 additions and 123 deletions.
- Commit 4:** "fixed eyesightArray()" (main branch). Authored and committed last week. Showing 1 changed file with 7 additions and 7 deletions.

## Narrative Contribution Description

The image displays four sequential screenshots of GitHub commit pages for the repository AdamMEI / PopulationPlayground. Each screenshot shows a commit by user Gabe to the main branch, with the commit message, author/committer information, and file statistics.

- Commit 1:** "Tuned parameters, movement bug fix". Shows 1 changed file with 23 additions and 18 deletions. Committed last week.
- Commit 2:** "fixed movement again". Shows 1 changed file with 5 additions and 3 deletions. Committed last week.
- Commit 3:** "Stable parameters and random prey movement". Shows 1 changed file with 52 additions and 51 deletions. Committed 2 days ago.
- Commit 4:** "fixed prey speed randomness". Shows 1 changed file with 8 additions and 8 deletions. Committed 2 days ago.

Adam first created the initialization, feeding, and visualization functions, as well as some simple tests. Gabriel created the movement and reproduction functions. The movement and reproduction functions proved much more complicated than the others, as they required agents to determine their distances to other agents, find the closest one, and perform other tasks. The milestone occurred while Gabriel was finishing the movement and reproduction. The work up to this point was balanced 50/50. Once he finished, both students helped to work out bugs in each others' code.

Adam created simple lag cross-correlation plots and plots of the populations over time. He also improved the efficiency of the movement and reproduction by about seven times, enabling further analysis to run much faster. Gabriel performed most of the analysis, creating functions to graph the average populations across sets of simulations as constants like reproduction time changed. While Adam worked more on the coding of the simulation, the additional analysis provided by Gabriel balanced this out. Their contributions each contributed to half of the overall project.